Purpose: Excellence in teaching in the clinical environment is a priority for academic health centers, but ongoing faculty development in this setting is challenging to implement and measure. Research on faculty development in teaching has shown improved knowledge, attitudes, and skills; however, most studies rely on self-report and few include objective measures of change. This study aimed to assess the impact of an evidence-based intervention to improve clinical teaching in three areas identified as hospital and teaching priorities: critical thinking (CT), high-value care (HVC), and healthcare equity (HCE). Our purpose was to develop an effective and efficient approach to implement and assess ongoing workplace quality improvement in teaching.

Methods: In Setting: Beth Israel Deaconess Medical Center in Boston, MA, USA. The hospital IRB determined the study to be not human subjects research (quality improvement). We used the behavior change Theory of Planned Behavior and Knowledge Translation or not yet ready to inform intervention development. Three working groups (CT, HVC, HCE) of 6-8 members each developed a 2-hour session for their topic, creating resources including video, didactics, exercises, and handouts. Learning objectives were distilled from literature reviews and aligned with competencies as defined by medical school and housestaff education accrediting bodies. The training was delivered from January-March 2017.

Data collection included observation and audio-recording of ambulatory and inpatient precepting and inpatient rounds, pre- and post-surveys, and post-intervention focus groups. We developed an observation instrument based on learning objectives for each topic. For CT, domains included use of questions to stimulate critical thinking and teaching about sources of bias in thinking. In HVC, domains included discussion of test characteristics and patient-centered decision-making. HCE domains included attention to affordability and access to care. The observation instrument demonstrated high interrater reliability (Krippendorff alpha=.91).

Three groups of faculty were observed: intervention (IG), comparison (CG), and working group (WG) members. Analyses compared counts of post-intervention teaching behaviors per hour in each of the topics across the three groups. Statistical analyses of counts were modeled with a generalized linear model using the Poisson distribution. Qualitative content analyses used the Framework approach.

Results: A total of thirty faculty members participated in the IG; 27 faculty served as CG, and 29 faculty participated as WG members. Faculty were observed during a median of 3 sessions each and a median total of 5.2 hours each. Pre-intervention observations suggested that teaching was similar across groups. Post-intervention comparison of teaching (average counts per hour) showed statistically significant differences across groups, specifically: critical thinking CG=5.1, IG=5.8, WG=6.0; high-value care CG=0.6, IG=0.9, WG=1.3; and healthcare equity CG=0.2, IG=0.5, WG=0.7.
In focus groups with intervention faculty, three main themes emerged related to intervention success. The first was the provision of a formal, structured framework to aid in clinical teaching of each topic. This enabled faculty to teach in a coherent and explicit manner, as opposed to prior informal, fragmented approaches. Second was the multi-departmental aspect of the sessions, which gave faculty a broader and more nuanced understanding of topics. Last was the institutional validation of the importance of the topics, which were identified as educational priorities at the medical center.

**Discussion:** Our faculty development intervention in teaching in the clinical setting demonstrated more frequent teaching in each of the targeted domains of critical thinking, high-value care, and healthcare equity. Faculty focus group findings provide support for prior reviews of current research, which recommend that interventions broaden their focus to include workplace learning, community building, and institutional support.1,2

**Significance:** With the creation of durable teaching materials and a validated instrument to measure change, this project sets the foundation for ongoing quality improvement in clinical teaching that can be disseminated and implemented in other hospital settings.
Personality Compatibility within Faculty Mentoring Dyads and Perceived Mentoring Outcomes

Research Highlights
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Purpose: Mentorship continues to be recognized as a critical approach to support successful careers in academic medicine.1-3 Even when formal mentoring programs are established, the quality of the relationship may influence mentoring outcomes. Recent research has focused on the quality of the relationship between mentees and mentors as a predictor of success.4-5 How to best match mentors and mentees to promote a successful mentoring relationship remains unclear in academic medicine. We applied the framework of person matching to investigate if concordance or discordance in personality traits of mentees and mentors impacts perceived success of mentoring relationships. We hypothesized that dyads more closely matched on personality traits will report higher mentoring success (defined by the perceived impact of mentorship on mentee career, mentee satisfaction with career trajectory and mentee productivity) compared to less closely matched dyads.

Methods: Surveys were sent via email to 376 mentoring dyads from 12 academic medical centers representing four geographic AAMC regions. Measures included perceived mentoring impact and Big Five Personality Inventory (BFPI; Openness, Conscientiousness, Extroversion, Agreeableness and Neuroticism). Surveys were completed by both mentees and mentors. The study was approved by the IRB. The responses from individuals in dyads were linked so that personality concordance could be calculated using the profile similarity coefficient, D2. Personality trait concordance in dyads and perceived impact of mentoring, satisfaction with career trajectory, and productivity was examined. This study was funded by a grant from the AAMC Group on Educational Affairs (Grant # 82177616).

Results: Survey data were received for 180 dyads yielding a 48% response rate. Dyads in which mentees perceived a positive impact on their career progression as a result of mentoring were more concordant on the personality trait of neuroticism, Survey data were received for 180 dyads yielding a 48% response rate. Dyads in which mentees perceived a positive impact on their career progression as a result of mentoring were more concordant on the personality trait of neuroticism (p = .0017). This personality trait emerged as the only trait in which similarity between mentee and mentor was statistically significantly related to perceived relationship success (defined as perceived impact of mentorship, satisfaction with career trajectory, and productivity).

Discussion: Our findings indicated that mentors and mentees who had higher concordance on neuroticism, whether high or low scores, reported that mentoring had a more positive impact on the mentee's career. Conversely, those with higher discordance on this trait reported less positive impact of mentoring on the mentee's career. Whereas the perceived impact of mentorship on mentee career progression seemed to be influenced by concordance and discordance on the trait of neuroticism, it did not seem to impact higher satisfaction on mentoring success with regard to career trajectory or productivity. While neuroticism emerged as a potential important trait to consider for mentoring matching based on personality in academic medicine, further investigation of prospectively matched dyads (rather than self-reported personality traits after matching) based on
the concordance of the neuroticism trait would be necessary to demonstrate the significance of our finding.

**Significance:** Further work to refine criteria for matching mentees and mentors considering personality traits may impact the effectiveness of mentoring relationships. Effective mentoring matches may contribute to positive outcomes for individuals and organizations such as increased retention. Demonstrating improved return on investment by both mentors and mentees may aid mentor recruitment and demonstrate mentoring program value to those who provide funding. Mentoring programs may become more efficient in identifying and matching dyads. Understanding the matching process and contributing factors may enable new approaches to mentoring.
Coaching towards competence in a PBL/CBL program: Medical school faculty may be the learners most in need of coaching

Research Highlights
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Purpose: Coaching in medical education is a growing area of interest, essential to professional development [1]. It requires the use of informed facilitation to ensure the learning process is meaningful for learners [2]. Medical schools have increasingly been encouraged to rely more heavily on formative assessments [3], including the use of informed self-assessments for learners [4]. The objectives of this study were to determine if (1) student performance on end-of-course summative assessments improves over time following mid-course informed self-assessments, and (2) faculty are more stringent on formative assessments of students performance as compared with summative assessments of students, in a problem/case-based learning program.

Methods: Data were collected for student assessment (n=98) during first and then second year small-group hybrid problem/case-based learning sessions (PEARLS) at the Zucker School of Medicine. PEARLS groups included 8-9 students and one facilitator per course; groups changed after each course. Faculty received standard faculty development for the assessment items and anchors on the PEARLS student assessment forms at mid- and end- points of each course. The same PEARLS assessment items and anchors was used for all formative and summative assessments in all six courses offered. The PEARLS assessment form contained 20 questions grouped into four categories: teamwork, leadership, thinking outside the box and process improvement. At midpoint for each course, students completed a self-assessment and faculty completed an analogous formative student-assessment of performance followed by one-on-one meeting between student and faculty member to review the forms and identify areas for improvement. At course end, faculty completed a summative version of the same assessment form. The standards for the end-of-course summative assessment forms were applied to the respective mid-course formative assessment forms for each course, generating a mid and end of course score for each student. A paired-samples t-test was conducted to compare the faculty assessment of student scores in formative and summative conditions for all 98 students in each of six courses.

Results: Significant differences on faculty assessment of student formative as compared with summative assessment of performance in PEARLS were found across all courses. The percent of expectations that were met were significantly lower on formative assessments than their summative counterparts (p < 0.0001 for courses 1, 2, 3, 4, & 6 and p < 0.005 for course 5).

Discussion: We observed considerable variability between formative and summative assessments of students across all courses. Students performed lower on formative assessments and higher on summative assessments. However, overall gains on summative assessments were not seen in subsequent formative assessments in the following course. In other words, the trend was more stringent assessment on the formative assessments, followed by more lenient summative assessments, followed by lower formative assessments of the same items. Our findings suggest that formative assessments more closely approximate true competence as compared with summative assessments which is a concerning finding. We attribute these findings to faculty factors, including discomfort with giving accurate feedback when it counts. Faculty who are credible and engaged are essential to informing students self-assessments [4] and informed facilitation is required to ensure the learning process is meaningful [2].

Significance: Our results indicate that formative assessments, including student self-assessment and faculty assessments, may more closely approximate medical students competence than
summative assessments, which may be relevant at other institutions. These findings highlight an important issue that warrants attention-the need to develop coaching strategies for faculty on their roles in delivering less than positive feedback to medical students, in particular as it relates to summative assessments. Faculty development efforts can be guided towards coaching and supporting faculty in delivering accurate feedback to medical students to maximize their effectiveness as coaches aiming to facilitate learners development of competence.
Money Talks: Physician faculty perceptions of an academic incentive program at a free-standing children’s hospital

Research Highlights
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Purpose: In recent decades, teaching hospitals that train medical students, residents, and fellows receive limited financial support for the educational mission from affiliate medical schools, yet are not exempt from the pressure of clinical productivity requirements. Further, time and compensation for teaching is not always possible given the reality of health care as a business (1,2). Previous literature only reports academic compensation metrics (1,2). Our qualitative, IRB approved exploratory study addressed how and why implementation of a monetary teaching incentive shapes physician-faculty perceptions about existing institutional culture and their professional academic identity at a free-standing children’s hospital. We also applied a sociological theory as a lens to interpret and explain findings during the pilot year.

Methods: In December 2016, PCH educational leadership devised a methodology for academic incentive pay funded by the physician medical group. A $450,000 allotment was broken into two parts. For part one, two-thirds was distributed to divisions based on total number of learners who rotated through the division. Part two was broken further into two portions: one for educational leadership positions that were not otherwise compensated by medical schools or given protected time (40%); and one for logged educational activity hours (60%).

PCH and the University of Arizona College of Medicine-Phoenix co-developed an online logging system for tracking and measuring academic effort. Only physicians holding academic titles were eligible to participate.

Ethnography and case study methodologies were implemented to understand the sociological aspects of academic productivity interventions to inform identity and culture (3,4). Data triangulation included open coding of in-depth individual semi-structured interviews of physician-faculty (N = 32/51; 63%), observations, and review of logging metrics.

Results: Two dominant themes emerged. First, nearly half of the faculty perceived an institutional culture shift toward academics. The introduction of a teaching incentive and efforts toward providing recognition for teaching helped shape this stance. Faculty expressed how the perceived shift in culture promoted enthusiasm for teaching responsibilities and committee service related to the academic mission.

Second, all faculty reflected on their academic identity and described a sustained, ingrained sense of altruism regarding teaching the next generation of pediatricians despite intense clinical workloads. Faculty found it problematic that teaching is expected by all, but not described in any formal contract, and often left to free time, evenings, and weekends. One third of faculty stated that the continuation of the incentive could assist with career planning, academic promotion, and increase academic prestige nationally. Among this subset, faculty expressed hope that the incentive could be a strong selling point to continue to attract and retain academicians to the institution.

Discussion: Overall, the incentive was well-received and served as a springboard for reflection about physicians own academic identity and institutional culture. Additionally, reports of elevated enthusiasm for teaching suggests positive faculty morale and identity development around education, informing institutional culture. The perceived cultural shift indicates institutional mimetic
isomorphism (5) occurring within PCH as they adopt an academic incentive similar to other departments (1,2,3). Implementation is a response to both internal (clinical) and external (academic rankings with national peers) competitive pressures as the institution matures and seeks to retain and recruit on par with or to surpass peers (5).

**Significance:** Despite selection bias, our study provides insight into faculty morale towards both teaching and the perceived academic direction of the institution. Our study moves beyond a review of metrics and indicates that incentives are critical to establishing and maintaining a strong academic culture while demonstrating the value of academic contributions. Faculty in the study internalized a cultural message from executive administration that the educational mission remains a priority in this era of clinical pressure.