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Impact of an economics of clinical operations course on faculty satisfaction

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Abstract
Faculty engagement and job satisfaction are essential to achieve the missions of academic medical centers (AMCs). This study investigated whether an "Economics of Clinical Operations" (ECO) course, designed to improve faculty understanding of institutional finances, had a positive impact on the attendees' perceptions of their career. This study compared questionnaire results of 102 faculty attendees who attended a course on institutional/individual practice finances and 102 matched controls to assess the course's impact on attendees' perceptions of their career after 3-18 months. Attendees reported improvement in practice efficiency (95.5% vs. 73.4%), practice profitability (95.2% vs. 56.2%), job satisfaction (86.3% vs. 55.6%), retention likelihood (80.5% vs. 58.5%), feeling supported (81.1% vs. 49.1%), and productivity (97.5% vs. 80.4%) compared with controls (all $p < 0.05$). Educating faculty on personal / institutional finances can not only improve financial performance but enhance faculty members' impressions of career satisfaction, institutional support and productivity.

Keywords: economics of clinical operations, faculty engagement, job satisfaction

1. Introduction
Faculty members are the life blood of academic medical centers (AMCs). The faculty body plays a pivotal role in ensuring the success of an institution via 1) productivity, 2) clinical excellence, and 3) quality of patient care. By the same token, lack of faculty engagement and job satisfaction can lead to an ineffective workforce and high faculty turnover [1, 2]. The economic downside of dissatisfied faculty members can be measured in terms of the costs of faculty turnover, recruitment costs, time to screen and interview candidates, excessive sick leave taken, and days without revenue during job vacancies [1, 2].

Retention of high quality faculty is crucial for medical schools to accomplish their missions and numerous studies have addressed the factors that drive faculty satisfaction, such as faculty participation in governance, effective communication from the dean's office, and faculty education on AMC finances [3-11]. Institutions that understand and embrace these values can attract and retain the best faculty.

In our institution, the Office of Faculty Development (OFD) sought to support clinical faculty by helping them learn about the institution's finances and how the faculty can maximize their clinical practice efforts. We developed a two-day Economics of Clinical Operations (ECO) course designed to teach business principles and best practices associated with clinical productivity.

The stated goals of the Economics of Clinical Operations (ECO) course were to 1) enhance the understanding of business principles associated with healthcare financial and related regulatory environments, 2) provide knowledge that led to better financial and operational management decisions and 3) improve the efficiency and profitability of the clinical services, functional unit and institution as a whole.

To our knowledge, no prior study has documented the existence of or reported on the impact of a similar faculty development program. In this study, we conducted a post-course survey to determine the program's impact on attendees' practice efficiency, practice profitability, practice productivity, job satisfaction, likelihood of remaining at the institution, and feeling supported. We hypothesized that, compared to faculty who did not attend ECO, attendees would report improvement in the variables described above.

2. Methods
The 2-day Economics of Clinical Operations (ECO) course was offered in November 2015, March 2016, November 2016, and March 2017. Clinical faculty in the School of Medicine who enrolled in the course were nominated by their department directors or by previous attendees. The faculty were selected based on their being highly active clinically and

that their practice productivity would benefit from more in-depth financial knowledge. After an initial cohort of 18 attendees, the course was capped at 30 attendees per session. In the 4 ECO sessions presented, there were 6 "no shows." Thus, to date, 102 faculty members have participated in the ECO program.

The course uses a combination of didactic material, case studies, and discussion to teach and apply economic and financial principles that are practical and applicable to physicians' practices. The course included the following elements: (1) Pre-viewing six 25-40 minute video lectures on business principles such as the resource based relative value system, revenue generation, and expense reduction, (2) Lectures and case studies on 13 topics during the two day course, and (3) End-of-day recap and discussion of presented materials. The topics in details were: 1) Introduction to the business of medicine, 2) Practical terminology and the vernacular of accounting 3) The resource-based relative value scale (RBRVS) system, 4) Right-sizing your resources in the ambulatory setting, 5) The revenue stream from billing and collections to accounts receivable, 6) Managing expenses, 7) Accountable care organizations and new concepts in value and payment, 8) The Maryland Waiver and Global Budget Reconciliation, 9) The future of value-based payments, 10) Building a business plan, 11) Executive overview of institutional finances, 12) Contracting and negotiating entities, and 13) How to read financial reports.(See Appendix A for the March 2017 Course Schedule).

A questionnaire designed to assess the impact of the ECO course was developed with administrative support in the spring of 2017 after the March 2017 ECO session. The questionnaire was administered during a two-week period in June and July 2017 using Survey Monkey (San Mateo California, www.surveymonkey.com). The target population included all 102 faculty members who attended any of the four ECO courses. The faculty members were requested to complete the questionnaire and were informed that the online survey tool would not track any personal electronic information. Anonymity was assured by providing a non-tagged web link to the questionnaire. Two weeks were allotted for the completion of the questionnaire. Three reminder emails were sent to encourage faculty members to participate in the survey.

The questionnaire included 6 questions which were designed to measure gains in faculty practice efficiency, practice profitability, practice productivity, job satisfaction, likelihood of remaining at institution, and feeling of being supported after attending the ECO course. The questionnaire items used a five-level likert-scale response categorization with answers ranging from strongly agree to strongly disagree. One final question solicited open comments.

The comparison group consisted of School of Medicine faculty members who did not attend the course. The comparison group was matched to the ECO participants on gender, rank, and department. The same questionnaire was administered to the comparison group in July 2017 after substituting "in the last 2 years" for "after attending the ECO course." As with the attendee group, two weeks were allotted for the completion of the questionnaire and 3 reminder emails were sent. This study was approved by the institution's human subjects review board. The questionnaire data were confidential as all data were analyzed and reported in the aggregate; data were not linked to individual respondents.

At the end of 2 weeks, 82 (80.4%) out of 102 faculty members in each group had completed the questionnaire. Because the questionnaire was anonymously distributed, the demographics of the faculty who participated in the survey were not known; however, the demographics of the 102 physicians in both groups on the whole are depicted in Table 1.

2.1 Statistical Analysis

In the initial analyses, we used the non-parametric chi-square test of independence to compare responses between the two groups for the combined response categories of strongly agree and agree vs. strongly disagree and disagree. We did not include "neither agree nor disagree" responses in this first analysis. In a second sensitivity analysis, we used all 5 categories of responses and applied an independent samples t-test to compare the summed responses of the attendees and the non-attendees. Statistical significance was set at $p < 0.05$. All analyses were performed using Stata 14 (Stata Corp LP, 4905 Lakeway Drive, College Station, Texas 77845-4512).

3. Results

The response rate for both the ECO course attendees and the control group was 80.4% (82/102). Of the 102 faculty members in each group, 46 (45.1%) and 30 (29.4%) belonged to surgical and medical departments respectively. 71 (70%) were male and 31 (30%) were female. Of the potential respondents, 31 (30.4%) were full professors, 36 (35.3%) associate professors, 34 (33.3%) assistant professors, and 1 (1%) was an administrative manager (Table 1).

Table 1: Demographics of 102 Attendees and 102 Comparison Subjects Surveyed in 2017.

Department	Attendees	Comparison group
Medical	30 (29.4%)	30 (29.4%)
Surgical	46 (45.1%)	46 (45.1%)
Other	26 (25.5%)	26 (25.5%)
Title		
Full Professor	31 (30.4%)	31 (30.4%)
Associate Professor	36 (35.3%)	36 (35.3%)
Assistant Professor	34 (33.3%)	34 (33.3%)
Administrative Manager	1 (1%)	1 (1%)
Gender		
Male	71 (70%)	71 (70%)
Female	31 (30%)	31 (30%)

Raw data responses of Attendees and Comparison are shown in Table 2. Please note that the total response number may differ between the groups depending upon whether the respondent skipped the question or answered in more than one column, both of which were allowed. In some instances the respondent made a "comment" instead of answering the question.

Table 2: Raw data responses of 102 Attendees and Comparison ("In the past two years" substituted for "Because of my attending the ECO course" for controls) in 2017.

Group	Questions	Total N	Strongly agree	Agree	Neither agree nor disagree	Disagree		Strongly disagree		P value
Attendee	Because of my attending the Economics of Clinical Operations course I have improved my practice efficiency	83	19 (22.9%)	45 (54.2%)	16 (19.3%)	2 (2.4%)		1 (1.2%)		0.004
Non-attendee	In the last two years, I have improved my practice efficiency	80	7 (8.7%)	40 (50.0%)	16 (20.0%)	10 (12.5%)		7 (8.8%)		
Attendee	Because of my attending the Economics of Clinical Operations course I have improved my practice profitability (improved margin)	79	9 (11.4%)	31 (39.3%)	37 (46.8%)	0		2 (2.5%)		0.001
Non-attendee	In the last two years, I have improved my practice profitability (improved margin	79	5 (6.3%)	22 (27.9%)	31 (39.2%)	14 (17.7%)		7 (8.9%)		
Attendee	Because of my attending the Economics of Clinical Operations course, my job satisfaction has improved	77	13 (16.9%)	31 (40.3%)	26 (33.7%)	6 (7.8%)		1 (1.3%)		0.01
Non-attendee	In the last two years, my job satisfaction has improved	81	7 (8.7%)	23 (28.4%)	27 (33.3%)	15 (18.5%)		9 (11.1%)		
Attendee	Because of my attending the Economics of Clinical Operations course, my likelihood of remaining at Hopkins has improved	79	9 (11.4%)	24 (30.4%)	38 (48.1%)	4 (5.1%)		4 (5.0%)		0.04
Non-attendee	In the last two years, my likelihood of remaining at Hopkins has improved	78	8 (10.3%)	23 (29.5%)	25 (32.0%)	14 (17.9%)		8 (10.3%)		
Attendee	Because of my attending the Economics of Clinical Operations course, my feeling of being supported at Johns Hopkins has increased	81	18 (22.2%)	25 (30.9%)	28 (34.6%)	7 (8.6%)		3 (3.7%)		0.008
Non-attendee	In the last two years, my feeling of being supported at Johns Hopkins has increased	80	9 (11.3%)	19 (23.7%)	23 (28.7%)	22 (27.5%)		7 (8.8%)		
			Increase by 0-20%	Increase by 21-40%	Increase by > 40%	No impact	Decrease by 0-20%	Decrease by 21-40%	Decrease by > 40%	
Attendee	Attending the ECO course has had this impact on productivity (RVU or academic output) in my career	84	28 (33.3%)	11 (13.1%)	0	44 (52.4%)	1 (1.2%)	0	0	0.002
Non-attendee	In the last two years, my productivity (RVU or academic output) has	78	26 (33.3%)	8 (10.3%)	7 (9.0%)	27 (34.6%)	6 (7.7%)	4 (5.1%)	0	

We found that course attendees, compared to their non-attendee matched peers, felt that they had gains in their practice efficiency (64/67 = 95.5% vs. 47/64= 73.4% total agree, $p < 0.001$), practice profitability (40/42 = 95.2% vs. 27/48 = 56.2% total agree, $p < 0.001$), job satisfaction (44/51 = 86.3% vs. 30/54 = 55.6% total agree, $p = 0.001$), likelihood of remaining at the institution (33/41 = 80.5% vs. 31/53 = 58.5% total agree, $p = 0.02$), and feelings of being supported by the institution (43/53 = 81.1% vs. 28/57 = 49.1% total agree, $p < 0.001$). As far as personal productivity in clinical and academic output, more course attendee said they had an increase (39/40 = 97.5%) than non attending faculty (41/51 = 80.4%, $p = 0.02$). The largest differences between attendees and non-attendees was the sense of their practice being more profitable (39.0% gap between groups), feeling supported (32% difference), and being satisfied at work (30.7%).

In the sensitivity analyses, we found that similar results. Attendees, compared to non-attendees, felt that they had gains in their practice efficiency ($p < 0.001$), practice profitability ($p < 0.001$), job satisfaction ($p < 0.001$), and feelings of being supported by the institution ($p = 0.001$). The likelihood of remaining at the institution ($p = 0.11$) was not statistically significant in this analysis (Table 3).

Table 3: Mean data responses of 102 Attendees and Comparison ("In the past two years" substituted for "Because of my attending the ECO course" for controls) in 2017.

Item	ECO group mean (SD)	Comparison Group mean (SD)	p value
Because of my attending the Economics of Clinical Operations course (In the last two years), I have improved my practice efficiency	3.95 (0.79)	3.37 (1.09)	< 0.001
Because of my attending the Economics of Clinical Operations course (In the last two years), I have improved my practice profitability (improved margin)	3.56 (0.79)	3.05 (1.03)	<0.001
Because of my attending the Economics of Clinical Operations course (In the last two years), my job satisfaction has improved	3.63 (0.9)	3.04 (1.12)	<0.001
Because of my attending the Economics of Clinical Operations course (In the last two years), my likelihood of remaining at Hopkins has improved	3.37 (0.93)	3.11 (1.13)	0.11
Because of my attending the Economics of Clinical Operations course (In the last two years), my feeling of being supported at Johns Hopkins has increased	3.59 (1.04)	3.01 (1.15)	0.001

*Strongly agree (5), Agree (4), Neither agree nor disagree (3), Disagree (2), Strongly disagree (1)

Responses to the open-ended question were coded by two of the authors (XX, YY) as showing either a positive, favorable or optimistic statement versus a negative, unfavorable or pessimistic comment. Of the 45 conference attendees' comments offered, 45 (100%) were coded as positive by one reviewer and 42 (93.3%) by the second reviewer. Of the faculty who did not attend the course, the comments were graded as positive, favorable or optimistic in 28.9% (11/38) by both reviewers.

The non-attendee faculty's dissatisfaction comments regarding institutional economics and finances are listed as below:

- They don't pay employees enough (some not even a living wage) but spend tons of money on administrators, agency employees, and consultants.
- Lack of transparency in compensation model continues to be an issue in our department.
- Decreased compensation due to department budget issues.
- Salary inequality with other institutions.
- Values grant money and research over clinical care.
- Have little information about what is actually economically productive.

4. Discussion

Although a number of AMC studies have assessed factors influencing medical school faculty job satisfaction [3, 4, 5, 6, 7, 8, 9, 10, 11], this study is one of the first to focus on the impact of improving a faculty members' understanding of institutional finances on faculty satisfaction and engagement. Our results demonstrated that attending a course on institutional business principles and finances led to faculty members' having an improved perception of practice efficiency, practice profitability, job satisfaction, likelihood of remaining at the institution, feeling of being supported and increased practice productivity compared with matched faculty who did not attend the course.

Job satisfaction can be defined as an individual's perception that her/his job values are fulfilled. Job satisfaction is a complex concept and it is crucial for health care leaders to understand the factors that affect it to design interventions to increase job satisfaction, employee and organization productivity, and performance [6, 7, 8, 9]. Moreover one study [10] has shown that job satisfaction is strongly associated with employee's engagement and retention in an organization. In addition, when a faculty member feels productive, that faculty member's self-esteem and satisfaction improves [8].

The lack of financial transparency of institutional operations has been listed as one of the reasons for job dissatisfaction which may contribute to high clinical faculty turnover [9]. Furthermore, faculty members are more willing to support administrative decisions if they know and understand how those (financial) decisions are made.

Consistent with the goals of the ECO course, on the post-course evaluations (data not shown), faculty stated that, after the course, they were more comfortable in understanding how to maximize revenue, minimize costs, increase their profitability, and analyze and read financial statements provided by business administrators. More importantly, our results showed that after the ECO course, attendees felt that they had made significant gains in measurable outcomes.

At the outset, the course directors believed that an understanding of healthcare business principles and the ability to apply strategies as a physician leader would enhance the financial success of the enterprise. However the course's impact on the institutional strategic objective of retaining the best clinical faculty was a secondary aim that was subsequently identified.

Attention to the respondents' comments indicated that they felt more valued when they were involved in financial decisions and the vast majority of open-ended comments were positive. Also non-attendee's comments demonstrated areas of faculty dissatisfaction regarding institutional economics and finances that were explicitly addressed in the ECO course.

There are limitations to our study. First, this is a single institutional questionnaire developed for a unique program that is catered to an academic practice. The study may be vulnerable to non-response bias and there were some faculty members who left the institution who may not have answered the survey questions. Second, because the questionnaire was anonymous, we were forced to perform matching with the total pool of 102 invitees to the survey rather than the 82 who actually answered the questionnaire. Third, the study did not actually measure the relative value units (RVUs) or other parameters of efficiency, productivity or profitability of the respondents. Rather, our survey was designed to measure short-term, individual respondents' perceptions. Nonetheless, we had an excellent > 80% response rate and the cumulative data from the four sessions of ECO shed light on the benefits of the program. Future program evaluations will measure long-term objective parameters. Fourth, the faculty who attended the ECO course might have a greater interest in their finances and practice success than non-attendees as they were recruited by department directors or previous attendees to attend and accepted the invitation.

5. Conclusion

In conclusion, educating faculty on the economics of their practice, the finances of their institution, and the business principles that can maximize the efficiency and profitability of a clinical practice can enhance their sense of career satisfaction, productivity, and support at their institution. If the principles described herein can be applied across other academic medical centers, it may serve as one technique for improving job contentment and the success of AMCs in this era of healthcare cuts.

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