

**Faculty Development**

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## Implementation of Curriculum by Family Medicine Fellows: What Factors Help and What Factors Hinder?

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**Background and Objectives:** *The need for change in medical curricula is increasing, due partially to tougher curriculum and evaluation standards. Participants in our academic medicine fellowship learn to develop curricula, but not all are successful at fully implementing them. This study looked for facilitators of and barriers to curriculum implementation by individual fellows. A literature review uncovered studies identifying institutional variables relating to successful curriculum innovation but little that identified variables pertaining to the individual curriculum developer.* **Methods:** *We interviewed alumni of the curriculum development track of the Primary Care Faculty Development Fellowship at Michigan State University, asking what promoted or hindered their curriculum implementation. We analyzed interview notes to identify themes according to a theoretical framework.* **Results:** *Common facilitators were (1) having a strong advocate, (2) perception of need for the curriculum by both fellow and institution, and (3) having a curriculum plan. Common barriers were (1) no time slot for curriculum, (2) fellow had left job, and (3) curriculum was too large or complex.* **Conclusion:** *Successful curriculum developers have powerful advocates of well-designed curriculum plans that address recognized institutional needs.*

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The need for curricular change in medical education appears to be increasing, due in part to tougher curriculum and evaluation standards.<sup>1,2</sup> Bland et al identified three categories of institutional variables that could influence the process of curricular change.<sup>3</sup> Context variables describe the organization, including its mission, goals, history of change, politics, and organizational structure. Politics, which include how resources are allocated, are especially relevant to curricular change. Curriculum variables directly reflect on the curriculum. They include the perception by the institution that change is needed and the scope and complexity of the change. Process variables refer to implementation. They include cooperative climate, participation by an organization's members, communication, evaluation, and leadership, among others.

Fellows in the curriculum development track of Michigan State University's Primary Care Faculty Development Fellowship (PCFDF) are trained to design, develop, and implement curricula. When these fellows implement their curriculum, however, not all

are successful. Are only institutional (context) variables involved in success or failure? Are there individual variables that faculty development fellowships can address? We found little information in the literature specifically pertaining to individual implementer variables that curriculum developers could modify to promote successful curriculum change. We did, however, find an article on idea transfer that seemed applicable.

Yelon and Sheppard<sup>4</sup> identified three variables that promote successful use of new ideas learned in a fellowship. The first is the individual fellow's perception of the need for the idea (in this case the new or revised curriculum). The second is how sensible the idea (topic and design of the curriculum) seemed to the fellow. The third is how much effort it took the fellow to implement the idea (the curriculum). Yelon and Sheppard adapted Slawson et al's "Usefulness Equation"<sup>5</sup> to describe the relationship among these factors in their "Cost-Benefit Transfer Model." The higher the fellow's perception of need for the new idea, the more sensible the idea seems to the fellow—and the less effort it takes the fellow to develop and implement the idea, the more likely the fellow will be to apply the new idea at work. These

relationships are expressed in the formula: (likelihood of applying new idea)=(need for the idea)x(sensibility of the idea)/(effort needed to implement the idea).

During our literature review, we were also able to identify research focusing on facilitators and barriers of curriculum implementation and clinical guidelines. Potter et al identified organizational-level facilitators and barriers when implementing a geriatrics curriculum<sup>6</sup> but did not identify individual implementer-level variables. Nuovo et al reported on strategies to overcome organizational barriers to implementation of a diabetes care management curriculum.<sup>7</sup> Again, individual-level variables were not addressed in the study. A study by Dunckley et al, while focusing on facilitators and barriers to implementation, was interested in implementation of palliative care clinical outcome measures and not on curriculum implementation per se.<sup>8</sup>

The purpose of our research was to determine the extent to which fellows were able to implement their curriculum. We also identified barriers of and facilitators to that implementation.

## Methods

The research was conducted among the alumni of our fellowship. Begun in 1978, the fellowship accepts 18 academic physicians every year and since 1985 has offered a combined academic fellowship to faculty in family medicine, general internal medicine, and general pediatrics. Typically half of the fellows each year practice family medicine. So far, the fellowship alumni total 416, more than 80% of whom continue in full-time academic medicine. During the year-long fellowship, the fellows attend sessions on campus for a total of 5 weeks, with the time between campus visits devoted to working on a major project in one of three tracks: research, educational leadership, or curriculum development. Only fellows completing curriculum development projects were included in our study.

The fellowship curriculum development project is a systematic development or revision of a course, clerkship, or rotation that will be implemented in the fellow's institution. Fellows perform a needs assessment and feasibility study before beginning their project. The project includes a rationale for the curriculum, goals, content outline, curriculum implementation, and evaluation plans. One unit must be developed completely, including unit goals and learning objectives, instructional and learner evaluation strategies, and all instructional materials and tests.

A 10-year cohort of 59 family medicine fellows who opted to do a curriculum project during the fellowship were the subjects for this study, which was approved by our institutional review board. One fellow was in the military and unavailable for participation, reducing the cohort available for study to 58. Approximately half (n=29) of the remainder did not respond to three e-mail messages requesting participation, while 30 agreed

to participate in telephone interviews, and ultimately 22 were interviewed, yielding a 38% interview rate. Interviews were conducted by two fellowship faculty, the authors of this paper.

## Instruments

We used the institutional variables identified by Bland et al<sup>3</sup> and the individual variables described by Yelon and Sheppard<sup>4</sup> to design our interview script for exploring barriers and facilitators and to guide our coding of the data. The telephone interview form comprised three parts: (1) demographic information, (2) free recall questions, and (3) questions based on the institutional and individual variables described above.

## Demographic Information

The demographic information collected included the curriculum topic and type, the fellow's medical specialty, the type and setting of the fellow's program, and the fellow's position within the organization during the fellowship.

## Free Recall Interview Questions

The free recall interview had five open-ended questions, differing depending on status of curriculum implementation: full, partial, or no (Table 1). As part of the fellowship requirements, each fellow pilot tests one unit of the curriculum. "Full implementation" means that all units of the curriculum were implemented, "partial" means that at least one unit in addition to the pilot unit was implemented, and "no" means that only the pilot unit was implemented.

## Interview Questions Based on Institutional and Individual Variables

We used prompts to ask further questions related to the institutional and individual variables (Table 2). An example question formed from the institutional prompts is: "Was there any organizational perception of a need to change the curriculum?" Initially we did not include prompts for the individual variables since we felt these were straightforward enough that they would be mentioned in the answers to the free-recall questions.

## Pilot Test

To test the questions and give the two interviewers experience in conducting the interview, a pilot test was conducted. For the pilot test, four participants were selected at random, two for each interviewer. We designed three types of interview forms, one for each type of curriculum implementation (full, partial, or no). After the pilot test we compared notes and found we had obtained similar results. The original interview form included prompts about the institutional variables but not the individual variables due to the more complex nature of the former. We decided to add prompts about the individual variables in the interest of a complete

Table 1

### Free Recall Questions Based on Curriculum Implementation Category

#### For Full and Partial Implementation

1. What were the most important factors in getting your curriculum (at least partially) implemented?
2. Were there any obstacles to get around? How did you do that?
3. Does your curriculum continue to be used? If so, what were the most important factors in the ongoing use of your curriculum? If not, why was it discontinued?
4. What were the most important factors in preventing you from fully implementing your curriculum? What else would you have needed to make this happen? (for partial implementation only)

#### For No Implementation

1. Why was your curriculum not implemented? What were the most important contributing factors? If those factors were eliminated, could you have done this?
2. What would you have needed to make this happen?

interview form, even though those variables surfaced in the answers to the free-recall questions (Table 2).

#### Data Collection

We divided the subject pool into two halves, half for each interviewer. Via phone calls and e-mail, we arranged interviews at times of convenience for the interviewer and participant. We first asked the free-recall questions, then questions based on the prompts, writing notes on the appropriate form throughout the interview. Each interview lasted between 15 and 40 minutes.

#### Data Analysis

We performed a qualitative analysis of the interview notes to identify factors promoting curriculum implementation (“facilitators”) and hindering implementation (“barriers”), according to the institutional and individual variables. We also looked for any other factors that might surface. We separately coded our notes, looking for mention of the variables. We then compared notes and arrived at consensus on the coded variables and whether the variables were facilitators or barriers to implementation. For example, if an utterance was: “Residency director was academically oriented, so was positive and supportive,” this was coded as the institutional subvariable “context/politics/advocate” because the residency director, a person with power in the institution, acted as a strong advocate and thus was a facilitator of the implementation.

Frequencies were tabulated for each code to determine the most common barriers and facilitators. These tabulations were done across and within the full, partial, and no categories. We counted each utterance a data point to determine the relative weight of barriers and facilitators. For example, if a fellow stated twice that

Table 2

### Prompts Used to Guide Interview Questions

#### Bland et al<sup>3</sup>

*Context:* Mission and goals, history of change in organization, politics, organizational structure

*Curriculum:* Need for change, scope/complexity of innovation

*Process:* Cooperative climate, participation by organization’s members, communication, human resource development, reward structure, evaluation, performance dip, leadership

#### Yelon and Sheppard<sup>4</sup>

*Need:* What really motivated you or your program to produce this curriculum? Was there a specific problem or goal that you were trying to solve or fulfill? How urgent was it? How critical was it? Who was seeing it as a problem? Why was it a priority?

*Sensibility:* Why did you write and plan this curriculum the way you did? Why did this curriculum—its goals and content—seem like the right thing to teach? Why was the method the right thing to do? How did you know this was the right thing to do? How did you know this was the way to go?

*Effort:* What sort of resources were used and how much of each? How would you rate the effort put into this versus other aspects of your load? How much effort did it take to do this? Why was this curriculum worth the effort?

the residency director had been supportive, this was coded twice.

#### Results

Of the 22 fellows interviewed, 13 (59%) reported fully implementing their curriculum, five (23%) reported partially, while four (18%) reported not implementing more than the pilot unit.

#### Facilitators

Table 3 presents the most common facilitators and barriers described by fellows. Among fellows who fully implemented their curriculum, the most often-cited facilitators were (1) having a strong advocate or institutional buy-in, (2) both the individual fellow’s and the institution’s perception of need for the curriculum, and (3) having a written curriculum plan as the basis for further development.

Among fellows who partially implemented their curriculum, the most often-cited facilitators were (1) having a time slot available for the curriculum, (2) both the fellow and the institution perceiving a need for the curriculum, (3) a curriculum not too large nor too complex, and (4) a curriculum to implement. Fellows who did not implement their curriculum beyond the pilot still cited several facilitators: a curriculum that made sense to the individual fellow, a perception by the organization of need for change, and the fellow’s perception of need for change and a cooperative climate.

Written notes of fellows' comments support these data. For example, one participant stated that the "Residency director was academically oriented, so was positive and supportive." (Strong advocate) Another stated that a "Perceived threat gave rise to need. Managed care penetration was not going away!" (Need perceived by institution and individual) A third stated that "Tightened up some modules, so more time became available. As new material appeared it was incorporated into the curriculum." (Written curriculum plan providing basis for further development)

*Barriers*

Among fellows who fully implemented their curriculum projects, there were still barriers: no time slot for the new curriculum, fellow left that job, and the curriculum was too large or complex to implement. Fellows who partially implemented cited these barriers: little time to work on the curriculum, curriculum was too large or complex, and developing the curriculum took too much effort. Fellows who did not implement their curriculum described barriers such as having a weak advocate or no institutional buy-in, no time slot for the curriculum, organization saw no need for change, and too much effort was required to develop the curriculum. Among the fellows who could not implement their curriculum beyond the pilot unit, one reported that the appearance of new technology rendered his project unneeded and another that the promised computer laboratory facilities were not available.

Fellows' comments reflected the aforementioned barriers. One stated that "Protected time was an issue, sometimes difficult to find time during chaotic days in the clinic environment." (Lack of development time) Another cited "Finding adequate time for didactics and small-group activity—10 pounds into a 1-pound bag." (Lack of curricular time). Barriers related to the complexity/size of the curriculum were reflected in the comment that "Health promotion/disease prevention is

tough! The information changes a lot . . . need expertise in broad areas to keep up with it all and organize lectures." Other examples included the statement that "There was no buy-in from people who mattered . . . maybe [I] needed to get the signatures of people who mattered." (Having a weak advocate or no institutional buy-in) And, "Need was not perceived by the second director [newly hired]." (Having a weak advocate or no institutional buy-in)

**Discussion**

Most of the facilitators and barriers reported by fellows support the research described in our framework articles. A strong advocate for change appears to be necessary for successful implementation of a new curriculum. Equally necessary is that the institution itself must perceive a need for the curriculum. A strong advocate and a perception of need by the institution may help in obtaining the resources needed to implement the curriculum. Indeed, three of the four fellows who did not implement their curriculum identified lack of a strong advocate.

Two fellows noted that there was no perception of need for the curriculum at their institution. This barrier is interesting, given that our fellowship criteria for choosing a curriculum development project include choosing a topic not only of interest to the individual fellow but one that addresses an institutional need. The need for a curriculum is discussed not only with the individual fellow but also with the fellow's immediate supervisor during an orientation telephone call. Perhaps the fellow's immediate supervisor may not be representative of the institution or know its perception of need. Perhaps the fellow needs to identify a stronger advocate before choosing a curriculum topic.

While some may confuse the institutional perception of need for the curriculum with individual perception of need, there are distinctions. If a person in a leadership position in the organization perceives a need and

Table 3

Common Facilitators and Barriers by Implementation Category

	<i>Full Implementation (n=13)</i>	<i>Partial Implementation (n=5)</i>	<i>No Implementation (n=4)</i>
Facilitators	1. Strong advocate or buy-in (n=9) 2. Individual need for change (n=9) 3. Organizational need for change (n=9) 4. Curriculum plan basis for further development (n=9)	1. Time slot available for curriculum (n=3) 2. Individual need for change (n=3) 3. Organizational need for change (n=3) 4. Curriculum was not too large/complex (n=3) 5. Had a curriculum to implement (n=3)	1. Curriculum makes sense (n=3) 2. Organizational need for change (n=2) 3. Individual need for change (n=1) 4. Cooperative climate (n=1)
Barriers	1. No time slot (n=4) 2. Left job (n=3) 3. Curriculum too large/complex (n=3)	1. Little time for fellow to work (n=3) 2. Curriculum too large/complex (n=3) 3. Too much effort required (n=3)	1. Weak advocate, no buy-in (n=3) 2. No time slot (n=2) 3. No need for change (n=2) 4. Too much effort required (n=2)

is willing to commit resources, implementation is more likely than if the curriculum developer alone perceives a need but has little or no control over resources. These two perceptions of need can be at variance with each other, affecting the likelihood of curricular implementation.

Another key finding was identification of a facilitator not identified by either Bland et al<sup>3</sup> or Yelon and Sheppard<sup>4</sup> but which appeared among fellows who either fully or partially implemented their curriculum—having a written curriculum plan. This facilitator should not be surprising. As part of their fellowship requirements, curriculum track fellows must produce a systematic and well-integrated curriculum plan that (1) summarizes the need for the curriculum, (2) presents an overview of the complete curriculum with respect to goals, objectives, and overall instructional and learner evaluation strategies, and (3) describes one unit in detail that includes all instructional and learner assessment materials. It is credible to assume that such a document could “make a case” for curricular implementation. The existence of a well-designed and prepared curriculum plan that addresses a recognized instructional need contributed to the possibility of implementation success for some of the fellows.

Nevertheless, it should be noted that the four fellows who reported not being able to implement their curriculum also had complete curriculum plans, as did those fellows who only partially implemented their curriculum. Thus, a well-written plan would appear to be helpful but not sufficient for successful implementation. This finding is important because, while it underscores the need for a well-written, complete curriculum plan, the existence of a curriculum plan is not enough to offset a curriculum whose scope is too large or too complex or that requires too much effort to develop or for which there is no need perceived by the institution. In our fellowship, the curriculum track mentors need to be more vigilant in identifying curriculum topics that are too ambitious or else dividing the project into smaller units so that the implementation might be successful if it could unfold over a longer time period.

### Limitations

There are several limitations to this study. First, we identified a 10-year cohort of fellows for participation, so recall of specific events could be inaccurate in some cases. Second, the low numbers of partial and nonimplementers relative to the full implementers do not allow for a full picture of barriers and facilitators to be described for those groups. Third, there is potential interviewer bias because the researchers, who are fellowship faculty, conducted the interviews and coded the data. To counter this potential bias, we had the fellows self-identify the status of their curriculum implementation, and we were careful to record answers verbatim when possible.

Fourth, the interview participation rate was rather low (38%). Given the projected time commitment (30 minutes) for the telephone interview, this may have served as a disincentive for participation by busy academic clinicians. Finally, using an a priori framework may have prevented other ideas from surfacing, although variables not accounted for in the theoretical frameworks used were, in fact, uncovered.

### Conclusions

A well-designed curriculum plan, supported by a powerful advocate and addressing a recognized institutional need, appears to promote curricular implementation success by fellowship faculty graduates. Conversely, the lack of these facilitators, plus a curricular innovation requiring too much effort on the developer's part, may result in implementation failure.

Our results validate a thorough process of needs assessment prior to curriculum development. Although this is already a key feature of the fellowship, we are seeking ways to strengthen the focus on identifying institutional need, a strong advocate, and support for fellows' curriculum development ideas. Additionally, we will have to ensure that the scope and complexity of the curriculum are not too large to be successfully implemented. We were gratified to see that the curriculum plan, the product of the curriculum development track major project, appears to promote successful curriculum implementation.

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