Advising in the Classroom: How Community College STEM Faculty Support Transfer-Bound Students

By Becky Wai-Ling Packard, Charu Tuladhar, and Jin-Sol Lee

The community college transfer pathway is vital for students pursuing 4-year degrees in science, technology, engineering, and math (STEM) fields today. This study focused on the important role of advising by examining the ways in which STEM faculty embed transfer advising into their classroom practices. Identified by students as being supportive of their transfer efforts, 70 faculty members teaching in STEM fields within three community colleges in Massachusetts participated in a survey. Overall, faculty spent about one hour of class time supporting students’ transfer goals; typically, faculty emphasized the STEM content needed at 4-year schools. Frequently named faculty, or faculty identified by many students, were significantly more likely to provide a motivational pep talk or discuss steps to transfer during class time as compared with rarely named faculty. Implications for research and practice are discussed.

About half of all college students in the United States who pursue science, technology, engineering, and math (STEM) fields begin their studies at a community college (Starobin & Lanaan, 2010). First-generation college students and racial-ethnic minority students are particularly apt to use the community college pathway (Bailey, Jenkins, & Leinbach, 2005). However, few transfer from a community college to a 4-year institution in a timely manner, if at all; less than one in 10 of the lowest-income students earn a 4-year degree after 6 years in the community college pathway (Tinto, 2004). Although many more STEM careers now require a 4-year degree (Carnevale, Smith, & Strohl, 2010), we lose many prospective baccalauraeates because they never actually transfer to a 4-year institution.

In contrast to STEM faculty at 4-year schools who are reputed for “weeding out” introductory students (Mervis, 2010; Seymour & Hewitt, 1997), community college faculty are renowned for their commitment to teaching (Twombly & Townsend, 2008). Even with the best teaching, however, some community college students will not make progress toward their transfer goals. Community college students who wish to transfer and earn a 4-year degree must learn about the transfer process, and therefore advising plays an important role. In this paper, we examine the ways STEM community college faculty support transfer by embedding advising into their classroom practice.

Community college STEM faculty as informal advisors

Students face high student-to-counselor ratios (Hagedorn, Cypers, & Lester, 2008; Hagedorn, Moon, Cypers, Maxwell, & Lester, 2006) and unclear transfer articulation agreements at the disciplinary level (Handel, 2007; Hoffman & Wallach, 2005). Many students do not receive disciplinary-specific transfer advising information early on in school, resulting in unnecessary delays (Packard, Gagnon, & Senas, 2012) that often impede STEM persistence (Packard, Gagnon, LaBelle, Jeffers, & Lynn, 2011). Coleman (1988) emphasized the importance of social capital, referring to the set of resources, insider knowledge, or referrals to opportunities that individuals can derive through interactions with others in a social network. A more comprehensive social network represents a more complex set of information channels and an increased likelihood for gaining social capital (e.g., Stanton-Salazar, 1997). Thus, it is advantageous for students to obtain advising from multiple sources, be-
Beyond official advising channels (e.g., initial advisors and transfer-office advisors). Faculty whom they see in class each week can offer discipline-specific advising and encouragement from within a student’s desired field of study.

McArthur (2005), however, found that many students in the community college student population did not know that faculty advising was even available. Indeed, thousands of students enroll in courses every semester, but not all have a conversation with their faculty members about their future or manage to secure a letter of recommendation. Tatum, Hayward, and Monzon (2006) surveyed over 400 faculty in a California community college to learn more about how faculty play a role in and out of the classroom to support the transfer goals of students. They found that, on average, faculty spent about 30 minutes of class time per semester talking about transfer and an additional 30 minutes per semester talking to a small number of students within individual meetings. They were most apt to talk about their personal experience at a 4-year school, explain the benefits of transferring to a 4-year school, and provide motivational pep talks. In this study, we aimed to build on this work to learn more about whether and how STEM faculty have supported students in their transfer goals by embedding transfer advising support into class time.

To summarize, the primary questions were as follows:
1. In what ways do faculty support transfer-bound students by embedding transfer advising into their courses? How much time do they take, and what are their motives?
2. Do frequently named and rarely named professors differ in their practices, time spent, or motives?

Method
Participants and context
Seventy faculty members (43 male and 27 female) participated in this study. They represented a range of fields, including natural sciences \( (n = 41) \), math \( (n = 23) \), and engineering \( (n = 24) \). Overall, 11 were under the age of 40, 17 were between 40 and 49, and 42 were 50 or older. Of those who provided their racial-ethnic background, the majority were European American \( (n = 57) \), and 6 faculty self-identified as a racial-ethnic minority (specifically, one Latino, one Native American, two Asian American, and two African American faculty participated). The faculty taught at one of three community colleges in Massachusetts. The college locations varied from a midsized urban community to a small urban community and a small rural community.

In Massachusetts, statewide coordination for transfer has improved in recent years (Commonwealth Transfer Advisory Group, 2008). Specifically, in 2010 a program was launched called MassTransfer, which outlines a block of units spanning five areas of curricular emphasis (natural/physical science, math, humanities, behavioral/social science, and English composition/writing); the block will transfer to any 4-year school in Massachusetts for general credit. Program-specific alignment or major-specific transfer of credits, however, is not guaranteed by the 4-year school.

Data sources
We used an adaptation of Tatum et al.’s (2006) survey (see the Appendix). The original survey had 26 questions; we included questions focused on faculty support of transfer in and out of the classroom but omitted the section on faculty knowledge of transfer. Faculty members were asked if they addressed both in class or in individual student meetings (a) how the material covered in class is needed by students for advanced study, (b) experiences faculty had when they were at a 4-year school, (c) how to apply to a 4-year school, (d) the difference between 2-year and 4-year colleges, (e) strategies for adjusting to a 4-year school, (f) what schools are best, (g) what programs are available, (h) the benefits of more education, and (i) a motivational speech to encourage students to transfer.

Next, faculty were asked to estimate the amount of time they engaged in transfer-related discussion within the class and in individual meetings, how many students the faculty members spoke to about transferring during a typical semester, and how many times they typically talked to each student. The survey also asked faculty about their motivation to support students.

Procedure
To identify faculty for this study, we used a student nomination method (described by Asher, Singleton, Tinsley, & Hymel, 1979). This method is appropriate when it is preferable to identify a core group of participants who share certain characteristics (e.g., faculty who supported students in their transfer goals) rather than surveying a broader sample of participants (e.g., faculty at large). In this study, each college’s STEM dean was approached after Institutional Review Board procedures were followed to request voluntary participation of students in a longitudinal study.
of STEM transfer. Overall, 105 students participated in the longitudinal study, and they were asked to name the people who supported them in their transfer process. We generated the recruitment list of faculty by examining the support persons named by students and culling the names of faculty in STEM fields. Collectively, 122 faculty were invited to participate, or about 35–45 per college. The invited faculty represented approximately 65% of the full-time faculty in STEM fields at each campus, according to the rosters of faculty affiliated with core STEM programs of study (i.e., math, biology, health/general science, engineering/physics, environmental science, and computer science) on each campus. Each faculty member was informed of the topic of the study and the voluntary nature of his or her participation. The surveys were confidential and prelabeled with a field and number (e.g., Math Professor 102). Faculty were provided a nominal gift card to a coffee shop as a thank you.

We saw all faculty in this study as contributing positively to student transfer. However, we were interested in comparing the behavior of frequently named and rarely named faculty because of the possibility that frequently named faculty might demonstrate a different approach or time investment. The largest cluster of faculty was nominated by three or fewer students, with most students nominating one faculty member; these faculty were referred to as rarely named faculty. Other faculty were named by 5 to 10 students and referred to as frequently named faculty. Overall, we had a 57% response rate, yielding 45 rarely named and 25 frequently named faculty participants. We generated overall frequencies for faculty actions, time, and motives. Then, we compared frequently named faculty with rarely named faculty.

**Results**

*Embedding advising into the classroom*

In class, faculty engaged in a range of actions that supported transfer of students (see Table 1). For example, faculty frequently discussed

<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Advising actions</th>
<th>In class</th>
<th>Individual meetings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advising actions</strong></td>
<td>All professors (n = 70)</td>
<td>Frequently named (n = 25)</td>
</tr>
<tr>
<td>Discuss content needed</td>
<td>81.3%</td>
<td>88%</td>
</tr>
<tr>
<td>Share personal experiences</td>
<td>70%</td>
<td>80%</td>
</tr>
<tr>
<td>How to apply or transfer</td>
<td>10%</td>
<td>16%</td>
</tr>
<tr>
<td>Difference between colleges</td>
<td>41.4%</td>
<td>44%</td>
</tr>
<tr>
<td>Strategies for adjusting</td>
<td>24.3%</td>
<td>40%</td>
</tr>
<tr>
<td>What schools are best</td>
<td>21.4%</td>
<td>28%</td>
</tr>
<tr>
<td>What programs are available</td>
<td>47.1%</td>
<td>60%</td>
</tr>
<tr>
<td>The benefits of more education</td>
<td>61.4%</td>
<td>68%</td>
</tr>
<tr>
<td>Motivational speech</td>
<td>32.1%</td>
<td>48%</td>
</tr>
</tbody>
</table>

*Note: *p < .05*
material students will need for advanced studies (81.4%) and shared personal experience from being at a 4-year school (70%). The actions faculty took in class were different from ones they took in individual meetings with students. Although faculty were not as likely to provide a motivational pep talk when in class (32.1%), many took this action within an individual meeting with students (71.4%). Also, while faculty seldom discussed steps involved in how to transfer in class (10%), they were much more likely to talk about this in a meeting (45.7%).

Significant differences existed when comparing the behaviors of frequently named professors and rarely named professors. Frequently named professors ($M = 4.72, SD = 2.07$) tended to take about two more actions in class than rarely named professors ($M = 3.4, SD = 2.04$), $F(1, 68) = 6.615, p = .012$. Specifically, frequently named professors were more likely to discuss strategies for adjusting to a 4-year school in class, compared to rarely named professors, $\chi^2(1) = 5.223, p = .02$. In addition, frequently named professors were more apt to give a motivational pep talk about transferring in class, in comparison to rarely named professors, $\chi^2(1) = 4.042, p = .04$.

**Faculty motives for supporting students**

Faculty reported that they want to help students (91%), they get satisfaction in knowing that a student has advanced in his or her education (87%), and they feel it is a professional responsibility (77%). Faculty members described the characteristics of students that compelled them to take action to support the students. Most emphasized academic qualities such as strong academic performance, persistence, or curiosity for learning (51%); having some knowledge that the student really wanted to transfer or further his or her education (36%); or some other aspect of the interaction, such as feeling a connection to the student as a result of being the student’s official advisor or noticing that the student is a nontraditional student and wanting to help him or her (13%). No differences were observed when comparing the motives of frequently named faculty and rarely named faculty.

**Discussion and recommendations**

Faculty in this study embedded advising about transfer into their classroom teaching. Typically, faculty used class time to explain content material needed at the 4-year level. Expectancy-value theory has suggested that in order to be motivated to achieve a goal, one must expect that engaging in certain behaviors will lead to the goal, and one has to value the outcomes of the goal (Wigfield & Eccles, 1994). Indeed, instrumentality, or the value that comes from knowing that what one is doing now will relate to one’s longer term goal, is a consistent predictor of academic motivation and the use of effective learning strategies (Miller, DeBacker, & Greene, 1999). Thus, when faculty emphasize that students will need to know particular content to succeed at the 4-year school, they increase utility value of the content and boost motivation.

Frequently named faculty were more likely to use class time to give a motivational pep talk about transferring or to discuss strategies to adjust to a 4-year school than were rarely named faculty. One can reasonably suggest that when faculty use class time to motivate students to transfer or provide strategies that would help them to imagine adjusting to a 4-year school, they reach many more students than they can by relying only on individual meetings. In addition, by engaging in these actions, faculty can boost the expectancy students hold that transferring to earn a 4-year STEM degree is something they could pursue.
This study is limited by certain features. The faculty were located in one region in Massachusetts. The only data source was survey data from faculty; much could be gained by including students’ descriptions of how they experienced faculty advising in the classroom. In this study, we were not able to link the student’s progress in the transfer pathway to faculty advising interactions. Finally, the faculty were generated by student nomination and may not be typical of STEM faculty in community colleges; we also acknowledge the possibility that frequently named faculty reached more students because they taught more students overall or taught more favorable courses (e.g., Thayer-Bacon, Arnold, & Stoots, 1998).

Despite these limitations, we suggest the following implications. For underrepresented students (e.g., women in physics or students of color), embedded advising may be important because these students especially benefit from positive faculty–student interactions (Lundberg & Schreiner, 2004). According to Carlone and Johnson (2007), identity is a central aspect of persistence in STEM fields. Students must gain competency and perform their learning through their participation in class. In addition, they must gain recognition, both by faculty and others in the field, so that they will come to see themselves as members of the field. Recognition can come from a professor talking to the student and encouraging the student to consider transferring to obtain a higher level position in the field. We see individual meetings with students as a common way for recognition to be communicated by faculty; indeed, taking a more proactive, meetings-based approach to advising is highly recommended as beneficial to student persistence (Smith, 2007).

In the future, research could be conducted that follows the progress of students enrolled in the courses of faculty who provided classroom-based transfer advising. Possibly, the students who have more comprehensive channels for advising would be more successful in their transfer progress than students who have not received such support. In addition, future research could examine the ways in which transfer or general advising offices work in conjunction with faculty, such as through collaborative initiatives or training, to pool knowledge and streamline advising messages. An additional area for future research would be to examine how faculty at large view advising. Do they view advising as an important topic to teach within class time, as important as other topics such as scientific writing (Jerde & Taper, 2004) and academic integrity (Craig, Ferdici, & Buehler, 2010)? In this paper, we focus on the structural factors and institutional practices that can play a role in what the advising students receive. However, we acknowledge that community college students, like students at other institutions, vary in their prior experiences, motivation, and resourcefulness. Future research could investigate the ways in which students vary in their proactive stance toward seeking resources as a way of deepening our understanding as to why some students are able to access advising information.

One promising implication from this study is the practice of embedding transfer messages into class time, even a few minutes per week. Faculty can talk about the value of going to a 4-year institution, encourage students to transfer, advertise the transfer office’s next session as a way to outline steps toward transfer, talk about careers that students could have if they continued with their education, and describe the kind of careers that use the content students are learning. Transfer offices as well as academic support units on campus could collaborate with faculty to provide materials for circulation so that more students are reached than could be achieved by student initiation within individual meetings. The data in this paper suggest the positive impact of embedded faculty advising as a time-effective strategy for facilitating students in the STEM transfer pathway. Strategies of this nature have a profound potential contribution to the STEM workforce and the education of transfer-bound STEM students.

References


**Becky Wai-Ling Packard** (bpackard@mtholyoke.edu) is a professor, Charu Tuda (Occasional Group) is a student, and Jin-Sol Lee is a student, all in the Department of Psychology and Education at Mount Holyoke College in South Hadley, Massachusetts.
Appendix: Faculty survey (adapted from Tatum et al., 2006).

The following survey is intended to obtain information from the instructors at the college regarding the transfer of students from the community college to four-year colleges and universities. The items are constructed to reveal instructors’ perceptions of the transfer process and to document specific activities that support student transfer. Your participation is completely voluntary, and you are under no obligation to complete the survey. However, we greatly appreciate your assistance in the collection of this information. We are interested in the group data only, and the information you provide will be kept strictly confidential. The information will be coded, and no attempt will be made to connect names to the coded data.

1. What kinds of information do you discuss in your classes that are relevant to transfer?
   (a) material covered in class that students will need for advanced study
   (b) experiences you had when you were at a four-year school
   (c) how to apply to a four-year school
   (d) the difference between two-year and four-year colleges
   (e) strategies for adjusting to a four-year school
   (f) what schools are best
   (g) what programs are available
   (h) the benefits of more education
   (i) motivation speech to encourage students to transfer
   (j) other (please specify)

2. Of the courses you teach, in which course do you spend the most time discussing transfer issues?

3. In this course, estimate the amount of class time per semester you spend discussing material relevant to transferring.
   (a) less than 10 minutes
   (b) 10–30 minutes
   (c) 31–60 minutes
   (d) 1–1½ hours
   (e) between 1½–2 hours
   (f) between 2½–3 hours
   (g) more than 3 hours (how many?)

4. Approximately how many students do you talk to individually about transferring during a typical semester?
   (a) none
   (b) 1–5
   (c) 6–10
   (d) 11–15
   (e) 16–20
   (f) 21–25
   (g) more than 25 (how many?)

5. If you talk to students about transferring, approximately how many times during a semester do you speak to a typical individual student?
   (a) only once
   (b) 2 times
   (c) 3 times
   (d) 4 times
   (e) 5 times
   (f) 6 times
   (g) more than 6 times (how many?)

6. If you talk to students individually about transferring, approximately how much total time do you spend with the average student? If you tend to talk to students more than once, estimate the total time you spend over the different sessions.
   (a) less than one minute
   (b) 1–10 minutes
   (c) 11–20 minutes
   (d) 21–30 minutes
   (e) 31–40 minutes
   (f) 41–50 minutes
   (g) 51–60 minutes
   (h) more than 60 minutes (how many?)

7. If you talk to students about transferring, what topics do you discuss?
   (a) how to transfer
   (b) how to adjust to the new school
   (c) course material that will help them
   (d) what schools to attend
   (e) what programs to take
   (f) your personal experiences
   (g) the benefits of more education
   (h) the differences between two- and four-year schools
   (i) pep talk to bolster their confidence
   (j) other (please specify)

8. Which of the following activities describe actions that you have taken within the last year?
   (a) helped a student find information on four-year schools
   (b) wrote a letter of support for a student
   (c) made a phone call for a student that helped the student transfer
   (d) introduced a student to someone who could help in the transfer process
   (e) helped a student learn academic material not available
   (f) supported a special project for a student
   (g) talked about transfer to friends, parents, or the spouse of a student
   (h) other (please specify)

9. What are the reasons you take an active interest in helping students transfer?
   (a) it is my professional responsibility
   (b) I like students and I want to help them in any way I can
   (c) I want to do my part in increasing the transfer rate
   (d) I get personal satisfaction in knowing that one of my students advanced their education
   (e) It adds to the prestige of my department
   (f) Other (please specify)

10. Describe the characteristics of students with whom you tend to meet to discuss transfer and/or write letters of recommendation for transfer. What makes those students stand out?

11. What do you think leads some students to get on track to transfer rather quickly or smoothly? For example, any key decisions, actions, or support?

12. What do you think leads other students to have more difficulty with transferring (taking more time or not actually making the transfer)? For example, any key decisions, actions, or barriers?

13. Any additional comments?

Demographics

14. How many years have you been teaching at this community college?


16. Gender

17. Ethnic Background (select all that apply)
   (a) Hispanic/Latino
   (b) African American
   (c) Asian/Pacific Islander
   (d) Native American
   (e) European American
   (f) Middle Eastern/Persian
   (g) Not listed: please specify
Copyright of Journal of College Science Teaching is the property of National Science Teachers Association and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.