

# The Talking Points Tool: A Brief Intervention to Support Predoctoral Student and Faculty Advisor Communication

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## Abstract

Excellent relationships between predoctoral students and faculty supervisors can lay the foundation for a satisfying degree program and productive future. Contrarily, poor relationships can frustrate both students and supervisors. We examined mentoring experiences focused on career development. Students desired enhanced career mentoring but were uncomfortable approaching their supervisors with these concerns. Faculty advisors reported willingness to support students' career development, yet expected students to initiate those conversations. Responding to this communication disconnect, we developed a brief intervention to facilitate conversations—a Talking Points Tool (TPT). In this paper, we examine whether the TPT influenced students' career conversations and development.

## 1. Introduction

The career development of biomedical predoctoral students is an important educational and policy concern [1-2]. The academic labor market is a shifting and competitive landscape: the number available tenure-track faculty positions is continuously declining, and only 28% of STEM PhDs secure such positions within five years of graduation [3]. It is therefore imperative that students have the skills to pursue a variety of nonacademic career pathways [4]. An increasing proportion of predoctoral students have turned their interests toward these “alternative” pathways and more openly express desire for the development opportunities necessary to support doing so [5-6].

Excellent relationships between predoctoral students and faculty advisors have long been found to support satisfying degree programs, student self-efficacy, progress toward goals, and future career success [7-9]. Previous research

has focused on the supervisor's impact through in academic advising, skill development, and career development mentoring [10]. Despite the important role supervisors can play, one study found that as much as 36% of doctoral students receive no career advice, and another 20% receive less than they want [11]. Given these contextual shifts, effective, ongoing communication between students and their supervisors is more important than ever.

This paper draws on a larger study of a biomedical engineering (BME) department at a large research university. In the first section, we briefly describe results from an initial student survey and interviews with BME students and faculty, focused on understanding mentoring practices and culture in the department and potentially different perceptions between the two groups. In response to our findings and emergent literature, which calls for means of supporting student and faculty communication, we developed a brief intervention to facilitate career development mentoring—a Talking Points Tool (TPT). In this paper, we focus on the following research questions:

1. How often do BME predoctoral students engage in career-focused conversations (CFCs) with their faculty supervisors, how often would like they to do so, and did their desired frequency of these conversations change after receiving the TPT?
2. How comfortable are BME predoctoral students in requesting CFCs with their faculty supervisors and in responding to suggestions for CFCs, and vice versa, and did student comfort levels change after receiving the TPT?
3. Did BME students engage in a CFC with their faculty supervisors as a result of receiving the TPT, and if not, what barriers do they report?
4. Did BME students engage in any career development behaviors as a result of receiving the TPT?

## 2. Materials and Methods

### 2.1 Fall 2016 Study

We conducted interviews with 26 BME predoctoral students and 7 faculty supervisors of those students and administered a web-based survey of all BME predoctoral students in Fall 2016 (19/92, 20.7% response rate). Questions focused on career development, career interests and goals, and mentoring and advising practices in the department. We analyzed interview data using structural coding, and survey data using descriptive and content analysis procedures.

### 2.2 The Talking Points Tool (TPT)

We developed the TPT drawing on the results of our 2016 study, doctoral education literature [7, 11-14], and career development theories [15-17]. The TPT is a one-page handout available electronically to all BME department members. It suggests that students have an up-to-date self-assessment of their skills, interests, and values, all components of widely used Individual Development Plans (IDPs), an approach also intended to promote professional development and mentoring [18-19]. All first-year students in the department are instructed to create an IDP at the beginning of their program and present their progress at the end of the year in their qualifying exam. Students more advanced in their programs are encouraged to continue using and updating their IDPs. The TPT also suggests that students have identified some career paths aligned with those self-assessments in advance of a CFC.

The TPT is then primarily organized into two columns, one with questions for students and the other questions for supervisors. Questions broadly focused on strategies for improving skills, investigating career paths, and modifying goals. Each set of questions for students has a set of corresponding questions for supervisors. For example, on the student side, questions noted, "I would like to improve my ability to [skill]. How do you recommend that I develop this skill?" On the faculty side, questions asked, "What skills have you developed recently and what methods did you use to develop them? What strategies were most and least effective for you?" These "matched" items are intended to support a conversation around skill-building and allow either partner in the mentoring relation to initiate questions about the topic. Developmentally, the faculty questions support student reflection and the skill of identifying strategies in themselves, while leaving the door open for support if the student is struggling.

The TPT is available as supplemental material.

### 2.3 Talking Points Tool Study

For this study, we conducted surveys of BME students and faculty for the TPT study. The Graduate Advisor for the department sent all students a pre-notice, explaining that the study would be taking place and that

students would receive the pre-survey, TPT, and post-survey. The Graduate Advisor distributed the TPT electronically to all predoctoral students using the BME department listserv after a three-week administration of the pre-survey, and suggested that students consider meeting with their supervisors. Faculty supervisors were then sent the TPT along with all correspondence the students had received. Our surveys asked students about their desired frequency of CFCs with their supervisors, comfort with requesting and responding to CFCs with their supervisors, barriers to initiating CFCs, and the influence of the TPT on initiating student-faculty CFCs. We also asked whether students engaged in other career development behaviors as a result of receiving the TPT.

## 3. Results and Discussion

### 3.1 Respondent Characteristics

About one-third (29/91, 31.9%) of students responded to the TPT pre-survey. We received usable responses from a similar proportion to the post-survey (30/91, 33.0%), and most who responded confirmed they received the TPT (24/91, 26.4%). About half (16/29, 55.2%) of the pre-survey respondents were among post-survey participants. We received usable responses from about one-fifth of the faculty (6/34, 17.6%). Female students made up a slightly lower proportion of respondents in each survey: Fall 2016 (38.9%), the TPT pre-survey (46.1%), and the post-survey (48.0%). Students were mostly not Hispanic (77.8%, 92.6%, and 96.4% for each survey, respectively) and White (66.7% in Fall 2016 and the TPT pre-survey, 60.7% in the post-survey). Students were divided in their degree program stages: half (50.0%) had completed their proposal exams in Fall 2016; a slightly greater proportion had not completed that exam in the TPT pre-survey (55.6%), and slightly less (48.3%) in the post-survey.

### 3.2 Fall 2016 Findings

The purpose of the Fall 2016 study was to assess career-focused mentoring in the department, compare perceptions between the two groups, and find areas for formative improvement. Students were moderately satisfied with their mentoring (measured on a scale from 1 to 5, with 1 being not at all satisfied and 5 being extremely satisfied; mean = 3.4,  $SD = 1.3$ ), but desired greater support in career development. Few (21%) students had the goal of obtaining a faculty position, and desired guidance in pursuing paths into other sectors. Some interview participants did not feel they could initiate conversations with their supervisors about these issues, either out of feelings of safety (seeking nonacademic careers may be penalized), mutually prioritizing research, or that the supervisor's ability to advise them in these areas was limited. Others simply did not know what to ask or how to get started. Meanwhile, faculty supervisors were willing to support students' career

development, but most expected students to initiate conversations about the topic and direct those efforts. In response to this communication disconnect, we concluded that students may need to be provided with explicit cues about when it is appropriate to bring up career development topics, and example questions to guide the conversation when doing so, consistent with extant doctoral education literature [11]. We developed the TPT and its distribution as one means of supporting CFCs in the department.

### 3.2 Pre-Survey Findings

In the TPT pre-survey, we asked students how often they currently have CFCs with their faculty supervisors, how often they want to have such conversations, how often they review their IDPs. Most pre-survey respondents had CFCs once per semester (44.8%) or once per year (34.5%); a few (13.8%) said they never do so. Yet, many indicated they wanted to have CFCs once a semester (34.1%) or once a month (27.6%). In other words, pre-survey respondents wanted to hold CFCs more often than they were. About half (45.0%) of students said they initiated CFCs, and about one-third (35.0%) said their supervisors initiated, while the remaining 20.0% said they both initiated CFCs in the relationship. Pre-survey students were somewhat comfortable requesting CFCs with their supervisors (measured on a scale from 1 to 5, 1 being not at all comfortable and 5 being extremely comfortable; mean = 3.6,  $SD = 0.9$ ) and responding to supervisors' suggestions for such conversations (mean = 3.8,  $SD = 0.9$ ). While holding these conversations, the majority (55.2%) of students said they never review their IDPs, while about one-fifth do so once per year (17.2%) and another one-fifth once per semester (20.7%).

### 3.3 Post-Survey Findings

In the post-survey, we asked all students the same questions as those included in the pre-survey to determine whether reviewing the TPT might have changed their impression of their mentoring needs and comfort in approaching their supervisors at a group level. In this survey, among all students, a substantial majority (70.0%) wanted to meet only once a semester to hold CFCs, and only a few wanted to meet monthly (13.3%). Among those who responded to both surveys, half (9/16, 56.3%) wanted to meet once a semester and one-fifth (3/16, 18.8%) wanted to meet monthly. Overall, students want to hold CFCs with their faculty supervisors less often than in the pre-survey.

In the post-survey, all students were somewhat less comfortable requesting CFCs with their supervisors (mean = 3.2 on a scale from 1 to 5,  $SD = 1.1$ ) and responding to supervisors' suggestions for such conversations (mean = 3.6,  $SD = 1.1$ ). Students who responded to both surveys were slightly less comfortable requesting CFCs than in the pre-survey (mean = 3.4,  $SD = 1.2$ ) and but reported no change in responding to suggestions for CFCs overall

(mean = 3.8,  $SD = 1.2$ ). That the group's overall comfort in approaching and responding to supervisors decreased is a somewhat surprising finding, given the departmental support around this issue, in that some literature suggests having a supportive environment can influence student confidence [16].

The most unexpected finding for this study is that no students reported having a CFC with their supervisors in the 7-week period after receiving the TPT, despite earlier evidence that these meetings were desired and would be beneficial. We asked students to identify factors that served as barriers to their initiating such a conversation overall. The most frequent were not enough time for the student (27.7%), not a high priority for the student (17.0%), not a high priority for the supervisor (14.9%), lack of supervisor time (14.9%), and preferring to speak with someone other than their supervisor (6.4%). A small percentage of students (6.4%) indicated they already held CFCs and did not need support initiating such a meeting.

We then asked students about why they didn't use the TPT specifically in a CFC with their supervisor. Most barriers, from the student perspective, were aligned with IDP strategies and tasks. Several (16.7%) said they did not have an up-to-date self-assessment, and a small proportion (8.3%) were not sure what career paths they were interested in at the time of the survey. Other students indicated that they were already having CFCs with their supervisors (12.5%) or knew what to ask (14.6%), while others said the questions did not fit their situation (12.5%).

As noted, we sought faculty supervisors' perspective on CFCs and the value of the TPT in facilitating mentoring relationships. In alignment with our 2016 findings, faculty post-survey respondents said they were equally comfortable initiating CFCs with the students they supervise (using the same scale as the students' questions; mean = 4.3,  $SD = 0.5$ ) and responding to such requests (mean = 4.3,  $SD = 0.8$ ). Nearly all (5/6, 83.3%) post-survey respondents said they held CFCs with their students, but only one respondent said they did so as a result of receiving the TPT. Three of the five faculty who did so said they initiated the CFCs (60.0%), and the other two faculty (40.0%) said their students did so. These data suggest that faculty remain open to supporting CFCs with the students they supervise.

Despite the low level of CFCs among these respondents, some students appear to be using the TPT to engage in career development behaviors. Those most frequently reported are some that seemed to prevent the CFCs from being initiated: reconsidering overall goals (17.5%); gathering information about career pathways (14.0%); identifying skills to improve upon (14.0%); reviewing skill, interest, and value self-assessments (10.5%); and initiating a CFC with a peer (12.3%).

It may be that the TPT is prompting students to prepare the groundwork for CFCs and meeting the assumptions laid out at the beginning: having a clear sense of one's self, overall goals, and several potential career options to discuss with a supervisor. When asked what would increase the likelihood of their using the TPT in the future, many (40.0%) of all students said a better understanding of their skills, interests, and values, and another third (31.4%) said a better understanding of available career options. A comprehensive interpretation of our study suggests that students may need a good deal of time to prepare for their CFCs, which requires self-assessment, organization, reflection, and planning, all of which are prompted by the TPT and IDP processes.

#### 4. Summary

This study investigated the influence of a simple intervention intended to facilitate career-focused conversations between BME predoctoral students and their supervisors. Students appeared slightly less comfortable in approaching their supervisors after receiving the Talking Points Tool and reflecting on all that is required in preparing for such conversations. Despite interest in meeting with their supervisors in the 2016 study and in the pre-survey, few CFCs took place. Students may yet be engaging in their self-assessment and individual planning activities; some students said they took actions toward that end as a result of receiving the tool. Lack of ongoing self-assessment and planning may act as a barrier to feeling comfortable and ready to initiate conversations with one's faculty supervisor.

We suggest that ongoing departmental and supervisor support of IDP, reflective, and communication processes can ensure positive growth for BME predoctoral students.

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#### References

- [1] V. Callier, and N. L. Vanderford. "Mission possible: putting trainees at the center of academia's mission," *Nature Biotechnology*, vol. 32, no. 6, pp. 593-594, 2014.
- [2] K. D. Gibbs, J. McGready, and K. Griffin. "Career development among American biomedical postdocs," *CBE-Life Sciences Education*, vol. 14, no. 4, pp. ar44, 2015.
- [3] M. R. Connolly, Y. G. Lee, and J. N. Savoy, "Faculty hiring by sex and race: New evidence from a national survey," in *the Annual Meeting of the American Educational Research Association, Chicago, IL, USA, April, 2015*.
- [4] G. Bosch, and A. Casadevall, "Graduate biomedical science education needs a new philosophy," *mBio*, vol. 8, no. 6, pp. e01539-17, 2017.
- [5] H. Sauermaann, and M. Roach, "Science PhD career preferences: levels, changes, and advisor encouragement," *PloS One*, vol. 7, no. 5, pp. e36307, 2012.
- [6] R. S. Clair, T. Hutto, C. MacBeth, W. Newstetter, N. A. McCarty, and J. Melkers, "The 'new normal': Adapting doctoral trainee career preparation for broad career paths in science," *PloS One*, vol. 12, no. 5, pp. e0177035, 2017.
- [7] L. L. Paglis, S. G. Green, and T. N. Bauer, "Does adviser mentoring add value? A longitudinal study of mentoring and doctoral student outcomes," *Research in Higher Education*, vol. 47, no. 4, pp. 451-476, 2006.
- [8] Y. Sakurai, K. Pyhältö, and S. Lindblom-Ylänne, "Factors affecting international doctoral students' academic engagement, satisfaction with their studies, and dropping out," *International Journal for Researcher Development*, vol. 3, no. 2, pp. 99-117, 2012.
- [9] C.M. Zhao, C. M. Golde, and A. C. McCormick, "More than a signature: How advisor choice and advisor behaviour affect doctoral student satisfaction," *Journal of Further and Higher Education*, vol. 31, no. 3, pp. 263-281, 2007.
- [10] D. F. Feldon, M. A. Maher, M. Hurst, and B. Timmerman. "Faculty mentors', graduate students', and performance-based assessments of students' research skill development," *American Educational Research Journal*, vol. 52, no. 2, pp. 334-370, 2015.
- [11] K. D. Welde, and S. L. Laursen, "The 'ideal type' advisor: How advisors help STEM graduate students find their 'scientific feet'," *The Open Education Journal*, vol. 1, no. 1, 2008.
- [12] L. Lunsford, "Doctoral advising or mentoring? Effects on student outcomes. *Mentoring & Tutoring, Partnership in Learning*, vol. 20, no. 2, pp. 251-270, 2012.
- [13] W. J. Ma, "The stories behind a CV," *Science*, vol. 357, no. 6354, pp. 942, 2017.
- [14] M.V. Sinche, *Next Gen PhD*. Cambridge, MA: Harvard University Press, 2016.
- [15] P. Cardoso, J. R. Silva, M. M. Gonçalves, and M. E. Duarte, "Innovative moments and change in Career Construction Counseling," *Journal of Vocational Behavior*, vol. 84, no. 1, pp. 11-20, 2014.
- [16] R. W. Lent, S. D. Brown, and G. Hackett, "Social cognitive career theory," in *Career choice and development*, S. D. Brown, Ed. San Francisco, CA: Jossey-Bass, 2002, pp. 255-311.
- [17] M. L. Savickas, "Career construction theory and practice," in *Career development and counseling*, S. D. Brown and R. W. Lent, Ed. Hoboken, NJ: John Wiley & Sons, 2013, pp. 147-183.
- [18] C. N. Fuhrmann, D. G. Halme, P. S. O'sullivan, and B. Lindstaedt, "Improving graduate education to support a branching career pipeline: recommendations based on a survey of doctoral students in the basic biomedical sciences," *CBE-Life Sciences Education*, vol. 10, no. 3, pp. 239-249, 2011.
- [19] F. Muindi, and J.B. Keller, "Emerging network of resources for exploring paths beyond academia," *Nature biotechnology*, vol. 33, no. 7, pp. 775-778, 2015.

## Talking Points

*This document suggests talking points that may facilitate career development discussions between a graduate student and their supervisor. These suggestions assume that the graduate student has up-to-date self-assessments of their skills, interests, and values, and has identified some career paths that are aligned with their self-assessments.*

Considering asking your supervisor...	Consider asking your student...
I would like to improve my ability to [skill]. How did you develop skills when you were a graduate student?	What skills do you plan to develop in the next [time period] and what do you plan to do next to develop them? Why is [skill] the most important ability for you to improve upon?
I would like to improve my ability to [skill]. How do you recommend that I develop this skill?	What skills have you developed recently and what methods did you use to develop them? What strategies were most and least effective for you?
I would like to improve my ability to [skill]. What short courses, webinars, workshops, books, websites, etc. do you recommend to develop this skill?	What kind of resources have been helpful to you in the past? What resources do you <u>need</u> to develop your skills?
I would like to learn more about [career path]. How did you learn about career paths when you were a graduate student?	What career paths have you learned about recently and what methods did you use to learn about them? How do these career paths align with your interests, goals, and research focus?
I would like to learn more about [career path]. Do you know any other graduate students who are interested in [career path]? Could you introduce me to someone working in this career?	What do you plan to do next to learn about possible career paths?
I would like to learn more about [career path]. What professional societies, conferences, etc. do you recommend that I engage with in order to learn about this career?	What resources do you have to learn about possible career paths?
I may need to modify my professional development plan. May I work with you to set new goals or objectives for [time period]?	What's getting in the way of your professional development? What problem-solving approaches have been successful for you in the past? Do you need to modify your goals or expectations in order to be successful?