Supplemental Material

CBE—Life Sciences Education

Hernandez *et al.*

Supplemental Materials

Student integration into STEM careers and culture: A longitudinal examination of summer

research mentors and project ownership

Project Ownership (I. Hernandez & Woodcock, 2015)

Instructions: The following set of questions ask about the extent to which you engaged in the

following activities in carrying out your research project this summer. To what extent did you

engage in the following?

    1 - Not at all

    2

    3

    4

    5 - To a very large extent

To what extent…

1. did I face challenges that I managed to overcome in completing my research project?

2. did I formulate a hypothesis for the research question?

3. was I in control of my research project?

4. was I responsible for the outcomes of my research?

5. did I choose the topic for my research?

6. did I work independently?

7. did I have opportunities to use my ingenuity and creativity to have input in the project?

8. did I learn to devise solutions to problems in my research?

9. did I design aspects of the research project?

Science Self-Efficacy (Chemers et al., 2011)

Instructions: Please rate your level of confidence engaging in the following tasks. This section assesses your confidence in your abilities to function as a scientist in your area. Indicate the extent to which you are confident you can successfully complete the following tasks. Please select the best answer on the scale from 1 (not at all confident) to 5 (absolutely confident).

      1 - Not at all confident

      2

      3

      4

      5 – Absolutely confident

1. Use technical science skills (use of tools, instruments, and/or techniques).

2. Generate a research question to answer.

3. Figure out what data/observations to collect and how to collect them.

4. Use scientific literature and/or reports to guide research.

5. Develop theories (integrate and coordinate results from multiple studies).

Science Identity (Chemers et al., 2011)

Instructions: Please indicate how strongly you agree or disagree with the following statements. The following questions ask how you think about yourself and your personal identity. We want to understand how much you think that being a scientist is part of who you are. For the purposes of this study when you see the word scientist it is intended to mean a student or professional undertaking research activities in your area of study (e.g. a biologist).

      1 - Strongly disagree

      2 - Disagree

      3 - Neutral

      4 - Agree

      5 - Strongly agree

1. I have come to think of myself as a scientist.

2. I feel like I belong in the field of science.

3. I am a scientist.

Science Community Values (Estrada et al., 2011)

Instructions: Please read each description below and think about how much each person is or is not like you. Indicate how much the person in the description is like you. Use a scale of 1-5 with the following statements.

      1 - Not at all like me

      2 - Not like me

      3 - Somewhat like me

      4 - Like me

      5 - Very much like me

1. A person who thinks discussing new theories and ideas between scientists is important.
2. A person who thinks it is valuable to conduct research that builds the world's scientific knowledge.
3. A person who feels discovering something new in the sciences is thrilling.
4. A person who thinks that scientific research can solve many of today's world challenges.

Role Modeling (Hoyt, Burnette, & Innella, 2012)

Instructions: Please answer the following questions about how much you identify with your summer research faculty-mentor as a role model on a scale from 1 (Strongly disagree) to 5 (Strongly agree).

      1 - Strongly disagree

      2 - Disagree

      3 - Neutral

      4 - Agree

      5 - Strongly agree

1. I identify with the life and accomplishments of my mentor.
2. I identify with the life of my mentor.
3. I identify with the accomplishments of my mentor.
4. I admire my mentor.

Mentoring Satisfaction (Ensher & Murphy, 1997)

Instructions: Please answer how strongly you agree with the following questions about your summer research faculty-mentor.

       1 - Strongly disagree

       2 - Disagree

       3 - Neutral

       4 - Agree

       5 - Strongly agree

1. I effectively used my mentor to help me develop.

2. My mentor met my expectations.

3. I am satisfied with my mentor.

Mentoring Psychosocial and Instrumental Support (Dreher & Ash, 1990; Hernandez et al., 2016)

Instructions: Please answer the following questions about your summer research faculty-mentor. To what extent does your mentor provide each of the following?

    1 - Not at all

    2

    3

    4

    5 - To a very large extent

Psychosocial Support

1. To what extent has your mentor discussed your questions or concerns regarding feelings of competence, commitment to advancement, or relationships with peers?

2. To what extent has your mentor conveyed empathy for concerns or feelings you have discussed with him or her?

3. To what extent has your mentor encouraged you to talk openly about anxieties and fears?

4. To what extent has you mentor shared their personal experiences with you?

Instrumental Support

1. To what extent has your mentor helped you finish assignments/tasks or meet deadlines that otherwise would have been difficult to complete?

2. To what extent has your mentor helped you improve your writing skills?

3. To what extent has your mentor given you challenging assignments that present opportunities to learn new skills?

4. To what extent has your mentor helped you find opportunities that would be beneficial to you professionally or academically?

5. To what extent has your mentor helped you meet people elsewhere?

6. To what extent has your mentor helped you meet other people in your field at the university?

References

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