



Undergraduate Research Mentoring Framework

Core Competencies for Effective Mentoring Relationships: **Mentors** ¹

Competencies	Attributes	Example Measurable Learning Objectives	INCLUDES Summit I Collective Input
Research	Developing disciplinary research skills	Teach mentees to design and carry out a research project; Provide opportunities to observe techniques	Provide for the development of logical/critical thinking skills
	Teaching and helping to learn disciplinary knowledge	Identify the knowledge mentees need to be successful in the discipline and guide them in learning that knowledge	
	Developing technical skills	Provide instruction in core disciplinary research techniques	
	Accurately assessing understanding of disciplinary knowledge and skills	Assess mentee learning of disciplinary knowledge and skills and provide feedback and guidance to address gaps	Assessing understanding
	Valuing the practice of ethical behavior and responsible conduct of research	Model the ethical conduct of research and actively engage in conversations with their mentees	Cultivating ethical behavior, Providing Ethics/Responsible Conduct of Research Training
	Developing mentee research self-efficacy	Foster mentees' internalization of their own research success	Fostering independence
	Developing science communication skills, both written and verbal (NEW)	Foster mentee's development of written and verbal communication skills	Poster & Journal author opportunities improve retention ³ ; Methods/results connections
	Interpersonal Skills	Listening actively	Give their undivided attention and listen to both their mentees' words and the emotion behind the words
Aligning mentor and mentee expectations		Establish and communicate mutual expectations for the mentoring relationship	Aligning mentor and mentee expectations; Articulating a mentoring philosophy
Building trusting and honest relationships		Offer honest and open feedback on how the relationship is progressing	
Maintaining effective communication (NEW)		Establish and maintain frequent contact, both face-to-face and electronic, with mentee; respond to mentee in a timely manner	Frequency of student-mentor contact is positively correlated with perceived mentor supportiveness and program satisfaction ³
Psychosocial & Career	Providing motivation and facilitating coping efficacy	Scaffold research work in ways that yield periodic success; celebrate the successes and offer support after failures	
	Developing mentee career self-efficacy	Foster and affirm mentees' career aspirations	Fostering independence
	Developing science identity	Recognize mentees as scientists	
	Developing a sense of belonging	Create a welcoming and inclusive research environment, especially at transition points	Promote camaraderie instead of creating a culture of competition ⁴

(Modified from Pfund, Christine, et al. "Defining attributes and metrics of effective research mentoring relationships." *AIDS and Behavior* 20.2 (2016): 238-248.)



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Competencies	Attributes	Example Measurable Learning Objectives	INCLUDES Summit I Collective Input
Culturally responsive/diversity	Advancing equity and inclusion	Employ strategies for recognizing and addressing issues of equity and inclusion	Talk about/highlight the contributions of a diversity of researchers in the field; Discussion/training about Imposter Syndrome; Success stories
	Being culturally responsive	Effectively negotiate dialogue across diverse dimensions	Foster discussions about assumptions that are based on your personal experiences that might reduce belongingness/accessibility to others
	Reducing the impact of bias	Consider their unconscious biases and regularly check that they are not negatively impacting their own or their research team's behavior	Mentors need not share their gender or race/ethnicity to be effective; Give honest and transparent messages about institutional cultures (Not to say is "ok" but to make mentee aware)
	Reducing the impact of stereotype threat	Recognize, acknowledge, and work to reduce stereotypes that may negatively impact their mentees	Understanding and mitigating stereotype threat
Sponsorship	Fostering independence	Continuously assess mentees' development and design increasingly challenging tasks and projects to advance mentees' independence	Fostering independence
	Promoting professional development	Identify opportunities for mentee professional development and support their engagement in them	Promoting professional development; Prompt student worker to integrate workplace learning w/ academic studies and future plans
	Establishing and fostering mentee professional networks	Introduce and facilitate relationship building between their network of colleagues and their mentees	Helping mentees find a larger mentoring network that includes people with lived, experiences and goals more similar to the mentee's; Workplace learning
	Actively advocating	Promote mentees' work; provide professional support	
Mentoring Models (NEW - Summit 1 Input)	Awareness of general factors that can affect mentor-mentee relationships ⁵	Recognize how one's own attributes may affect mentoring relationships	
	Assessment of mentoring competencies ⁶	Recognizing own mentoring strengths and weaknesses	
	Familiarity with evidence-based mentoring models ^{7, 8, 9, 10}	Determine aspects of different mentoring models that fit individual mentoring style	e.g. Entering mentoring; Relational mentoring, Intergenerational/Tiered mentoring; peer mentoring
Institutional Level (NEW – Summit 1 Input)	Two-year and four-year college partnerships	Seek opportunities for interaction between 2yr & 4yr professors and students	e.g. 2yr/4yr professor paired meetings to discuss teaching and research; 2yr students paired with mentor/research lab at 4yr institution
	Encourage and provide opportunities for external mentoring	Matching mentors with URG students outside their field - to aid with general issues	

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Core Competencies for Effective Mentoring Relationships: **Mentees** ¹

Competencies	Attributes	Example Measurable Learning Objectives	INCLUDES Summit I Collective Input
Research	Developing disciplinary research skills	Develop the skills to design and carry out a research project	Developing logical/critical thinking skills
	Teaching and helping to learn disciplinary knowledge	Seek guidance from their mentors to identify the disciplinary knowledge they need and be receptive to mentor feedback that guides their learning	Learning disciplinary knowledge
	Developing technical skills	Commit to learning and gaining proficiency in disciplinary research techniques	Developing technical research skills
	Accurately assessing understanding of disciplinary knowledge and skills	Self-assess learning of disciplinary knowledge and skills and respond to mentor feedback	
	Valuing the practice of ethical behavior and responsible conduct of research	Model the ethical conduct of research and actively engage in conversations with their mentees	Establishing responsible and ethical research practices
	Developing mentee research self-efficacy	Effectively manage anxiety associated with independently conducting research	Developing independence as a researcher; Developing research self-efficacy
	Developing science communication skills, both written and verbal	Seek opportunities to develop and enhance science communication skills	Poster & Journal author opportunities; Methods/results connections
Interpersonal Skills	Listening actively	Give their undivided attention and listen to their mentors	
	Aligning mentor and mentee expectations	Establish and communicate mutual expectations for the mentoring relationship	
	Building trusting and honest relationships	Offer honest and open feedback on how the relationship is progressing	Establishing and maintaining professional relationships (interpersonal skills)
	Maintaining effective communication	Maintain frequent contact, both face-to-face and electronic, with mentor	Respond to mentor communications in a timely manner
Psychosocial & Career	Providing motivation and facilitating coping efficacy	Acknowledge that research frequently involves setbacks and develop strategies to deal with them	Developing resiliency
	Developing mentee career self-efficacy	Seek opportunities to explore and prepare for a career	Building a sense of self-efficacy
	Developing science identity	Affirm themselves as scientists	Developing research identity
	Developing a sense of belonging	Actively engage and establish relationships with research team members	

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Competencies	Attributes	Example Measurable Learning Objectives	INCLUDES Summit I Collective Input
Culturally responsive/diversity	Advancing equity and inclusion	Identify strategies for recognizing and addressing issues of equity and inclusion	
	Being culturally responsive	Effectively negotiate dialogue across diverse dimensions	Help mentee develop cultural awareness
	Reducing the impact of bias	Recognize unconscious bias, regularly check that it is not negatively impacting their behavior, and address it when they observe it	Honest and transparent messages about institutional cultures (Not to say is "ok" but to make aware)
	Reducing the impact of stereotype threat	Recognize stereotypes associated with their group identity and address them to reduce potentially negative impacts	Understanding and mitigating stereotype threat
Sponsorship	Fostering independence	Push themselves to increase responsibility for and ownership of their research, while asking for support and guidance as needed	
	Promoting professional development	Identify and engage in opportunities to develop the professional skills needed to become a successful scientist	Developing research leadership and mentoring skills; Exploring and pursuing scientific research careers
	Establishing and fostering mentee professional networks	Actively identify and seek ways to meet and establish relationships with potential future colleagues in the discipline	Poster/conference paper author opportunities; attend conferences
	Actively advocating	Report successful outcomes to mentor; Seek out and accept advocacy	
Mentoring Models (NEW - Summit 1 Input)	Recognizing own role in mentoring relationship	Actively seek training to establish and develop relationships with mentors	e.g. Entering Research ¹¹
	Assessment of mentoring competencies	Provide feedback to mentor about mentoring strengths and weaknesses	
	Familiarity with benefits of and engagement in tiered/intergenerational mentoring	Actively seek and participate in tiered/intergenerational mentoring	
Institutional Level (NEW – Summit 1 Input)	Two-year and four-year college partnerships	Seek opportunities for interaction between 2yr & 4yr college students	
	Encourage and provide opportunities for external mentoring	Participate in mentoring relationships with external or informal mentors	

(Modified from Pfund, Christine, et al. "Defining attributes and metrics of effective research mentoring relationships." *AIDS and Behavior* 20.2 (2016): 238-248.)



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References

Ref #	Reference Citation
1	Pfund, C., Byars-Winston, A., Branchaw, J., Hurtado, S., & Eagan, K. (2016). Defining attributes and metrics of effective research mentoring relationships. <i>AIDS and Behavior</i> , 20(2), 238-248. * Additional references and metrics for each attribute in original framework are included in Table 1 of above paper
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