

Spring 3-22-2017

Mentoring Undergraduate Research Handbook 2nd Edition

Jennifer Hammack

Georgia College & State University, jennifer.hammack@gcsu.edu

Robin Lewis

Georgia College & State University, robin.lewis@gcsu.edu

Rebecca McMullen

Georgia College & State University, mcmullenr@fvsu.edu

Caitlin Powell

St. Mary's University California, cap9@stmarys-ca.edu

Rosalie Richards

Stetson University, rrichar1@stetson.edu

See next page for additional authors

Follow this and additional works at: <https://kb.gcsu.edu/urace>

Recommended Citation

Hammack, Jennifer; Lewis, Robin; McMullen, Rebecca; Powell, Caitlin; Richards, Rosalie; Sams, Doreen E.; and Sims, Jeanetta, "Mentoring Undergraduate Research Handbook 2nd Edition" (2017). *Mentored Undergraduate Research and Creative Endeavors (MURACE)*. 2.

<https://kb.gcsu.edu/urace/2>

This Book is brought to you for free and open access by the Undergraduate Research at Knowledge Box. It has been accepted for inclusion in Mentored Undergraduate Research and Creative Endeavors (MURACE) by an authorized administrator of Knowledge Box.

Authors

Jennifer Hammack, Robin Lewis, Rebecca McMullen, Caitlin Powell, Rosalie Richards, Doreen E. Sams, and Jeanetta Sims

Second Edition

Mentoring Undergraduate Research Handbook

Jennifer Hammack | Robin Lewis | Rebecca McMullen | Caitlin Powell
| Rosalie Richards | Doreen Sams | Jeanetta Sims |
All Authors Contributed Equally



Photography: Georgia College & State University | St. Mary's College
| Stetson University | University of Central Oklahoma

Coauthors College or University Affiliation: Georgia College &
State University | St. Mary's College of California | Stetson
University | University of Central Oklahoma

March 14, 2017 Georgia College & State University. This work is licensed under the Creative Commons Attribution-Non-Commercial-No Derivatives 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.



For PDF version of this book, go to <http://kb.gcsu.edu/urace>

BIOGRAPHIES OF AUTHORS

Jennifer Hammack, JD is associate professor of Justice Studies at Georgia College. She joined the faculty of the Department of Government and Sociology in 2001 and became the University's Pre-Law advisor in 2011. Professor Hammack



is founding faculty coordinator of Georgia College's Pre-Law Society and Mock Trial teams. Her Legal Writing students have assisted with research on cases for attorneys throughout the state. Professor Hammack holds a Master's degree in Criminal Justice as well as a Juris Doctorate from the University of Alabama. Email: jennifer.hammack@gcsu.edu

Robin S. Lewis, MPA, CRA is director of the Office of Grants and Sponsored Projects at Georgia College. She has 18 years of progressive experience in all areas of research administration. She is a board member for Research Administrators Certification Council as well as a Certified Research Administrator (CRA) with a special interest in training students at all levels in grantsmanship. As a founding member of the Undergraduate Research Initiative at Georgia College, Ms. Lewis provides research, expertise, resources, and training to prepare undergraduates for graduate school and the global workplace. Prior to joining Georgia College, Ms. Lewis worked at St. Jude Children's Research Hospital, University of Tennessee Health Science Center and the University of Florida. Email: robin.lewis@gcsu.edu



University of Tennessee Health Science Center and the University of Florida. Email: robin.lewis@gcsu.edu

Rebecca C. McMullen, Ph.D. is interim dean in the College of Education at Fort Valley State University. She continues to serve as a full professor of Teacher Education at Georgia College. Her expertise lies within mentoring teacher candidates, majoring in Special Education. She serves as the councilor on undergraduate research for both the local and national levels. Dr. McMullen is a member of the editorial review board for the *International Journal of Scholarship of Teaching and Learning*. She holds a Bachelor of Science degree in Special Education and Minor in Psychology from Mercer University and a Ph.D. in Learning Disabilities from Georgia State University.



She holds a Bachelor of Science degree in Special Education and Minor in Psychology from Mercer University and a Ph.D. in Learning Disabilities from Georgia State University.

Caitlin Powell, Ph.D. is associate professor of psychology at St Mary's College of California. Before this, Dr. Powell was assistant professor of psychology at Georgia College. The undergraduates she has mentored have presented their award-winning research at local, regional, and national conferences. Dr. Powell has published research regarding effective teaching practices in social psychology, one of her teaching areas, and is currently working to develop open source online materials for teaching research methods and statistics with a collaborative group of psychology faculty through a Teagle grant. Her Bachelor of Science



Her Bachelor of Science

degree was earned from Drake University and she obtained her Ph.D. in Experimental Psychology from University of Kentucky. Email: cap9@stmarys-ca.edu.

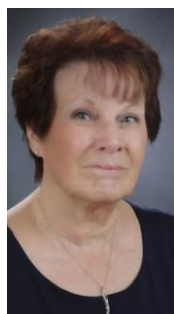
Rosalie Richards, Ph.D. is associate provost for faculty development at Stetson University. At Stetson, she leads all aspects of faculty development and support with a



focus on ensuring academic excellence and innovation and facilitating a learning environment of intellectual vibrancy, personal and social responsibility, success, and significance. A significant component of her portfolio advances experiential learning including undergraduate research and global community engagement. Prior to Stetson, Dr. Richards served as the first Kaolin-Endowed Chair in Science and Georgia Eminent Scholar at Georgia College and was the founding director of the Science Education Center at Georgia College. She has led a diverse portfolio of institutional projects including the STEM

Initiative, the Science to Serve Initiative, and the Institutionalizing Undergraduate Research Initiative. During her tenure at Georgia College, she also served as professor of chemistry and science educator, and conducted research with undergraduate and high school students in porphyrin synthesis, soil quality analysis, and issues in science education. Prior to Georgia College, Dr. Richards was the NASA-NSF Scholar-Teacher in Chemistry and assistant professor of chemistry at Spelman College. She is a consultant/workshop facilitator for the Council on Undergraduate Research. She holds a Bachelor of Science degree in chemistry with physics from the University of the Virgin Islands and a Ph.D. in chemistry from the University of Southern California. Email: rosalie.richards@stetson.edu

Doreen Sams, Ph.D., is the faculty coordinator for Undergraduate Research and Creative Endeavors where she is responsible for implementation and oversight of a



robust university-wide undergraduate research grant program. She is a professor of Marketing in the J. Whitney Bunting College of Business at Georgia College. Dr. Sams mentors undergraduate researchers who have published in marketing, sustainability, and international research. She publishes across disciplines. She is a member of the editorial advisory board member for the Journal of Transformative Learning, editorial review board for the Journal of Marketing Theory and Practices, International Journal of Scholarship of Teaching and Learning, and conducts manuscript reviews for several other journals and conferences

include CUR Quarterly. In 2005, she earned her Ph.D. from the University of South Florida and joined the faculty of Georgia College that same year. Email: doreen.sams@gcsu.edu.

Jeanetta D. Sims, Ph.D., is Assistant Dean in the Jackson College of Graduate Studies and associate professor in the College of Business Department of Marketing at the



University of Central Oklahoma. She teaches courses in marketing and communication, and is accredited in public relations (APR). Dr. Sims is the founder of Diverse Student Scholars, which is an interdisciplinary faculty model of student research engagement nearing its 10th anniversary (see: www.diversestudentscholars.com). She has received university and national awards for her teaching (in 2014, 2012, and 2009) and for her scholarship through winning top paper or merit awards from the university or at national and international conferences in 2017,

2016, 2013, 2012, 2010, 2009, 2008, and 2006. Along with numerous journal article, book chapter, and proceedings publications, she is co-editor of the annual *UCO Transformative Learning Conference Proceedings*, the *Journal of Transformative Learning*, and Developing Workforce Diversity Programs, Curriculum, and Degrees in Higher Education. Email: jsims7@uco.edu

Table of Contents

CHAPTER 1	1
BENEFITS OF UNDERGRADUATE RESEARCH MENTORING	2
Benefits to the Mentor	4
Benefits to the Student	4
Benefits to Higher Education	5
Benefits to a Liberal Arts Institution	5
Benefits to Graduate Programs	6
Benefits to Employers	6
References.....	6
CHAPTER 2	7
WHAT DOES UNDERGRADUATE RESEARCH LOOK LIKE?	9
What is Mentoring? Who are Mentors?.....	9
Mentoring Scholarship Overview	10
Mentoring Philosophies and Related Theories.....	11
References.....	13
Advising for Graduation and Beyond.....	17
Post-Baccalaureate Planning	18
Development of Life Skills.....	18
Presenting Research	19
Academic Advising.....	21
Field-Specific Professional Development.....	22
General Professional Development.....	23
Graduate School Preparation.....	23
<i>Testing, Testing, 1, 2, 3: Tips to Help Mentees</i>	23
<i>When Should Mentees Take the Entrance Test?</i>	24
<i>Should a Mentee Take the Test Again?</i>	24
<i>Picking Programs</i>	25
<i>Letter Writing</i>	26
References.....	26
Ethical Mentoring.....	29
Ethical Research Resources	29
Topics in Ethics	30
<i>Animal Welfare</i>	30
<i>Collaboration</i>	30
<i>Conflicts of Interest and Commitment</i>	30
<i>Data</i>	31
<i>Human Subjects</i>	32
<i>Mentor/Mentee Responsibilities</i>	32
<i>Publication Practices and Authorship</i>	33

<i>Research Misconduct</i>	33
Conclusion	33
References	33
CHAPTER 5	35
INCLUSIVE MENTORING	36
Resisting the Mentorship Process	37
Building Interpersonal Respect and Trust.....	38
Embodying Cultural Responsiveness.....	38
Undergraduate-Specific Considerations	39
References.....	42
CHAPTER 6	44
MENTORING AND WORKLOAD - PART I: MENTORING AND ORGANIZING	
RESEARCH ACTIVITY	45
Why Identifying a Personal Undergraduate Research Plan (PURP) Matters.....	45
What Should be Organized Post-PURP?	47
Conclusion.....	51
References.....	51
CHAPTER 6	52
MENTORING AND WORKLOAD - PART II: MENTORING AND MANAGING	
RESEARCH ACTIVITY	53
Suggestions for Faculty Mentors	53
Conclusion.....	54
References.....	54
CHAPTER 7	55
GROUP AND COHORT MENTORING	56
Example: College of Education Cohort Mentoring.....	57
CHAPTER 8	59
GEORGIA COLLEGE & STATE UNIVERSITY RESOURCES	60
Mission.....	60
Funding Sources for Georgia College & State University	60
<i>Showcase opportunities for Georgia College Student Scholars</i>	61
APPENDICES	i
APPENDIX A: EXTERNAL SOURCES OF FUNDING	ii
APPENDIX B: LIST OF UNDERGRADUATE AND DISCIPLINE-SPECIFIC	
CONFERENCES	vi
Undergraduate Research Conferences and Publications	vi
Discipline Specific Conferences.....	vii
APPENDIX C: SAMPLE POSTER	ix
APPENDIX D: LABORATORY NOTEBOOK INSTRUCTIONS	x
The Principle of Autonomous Replication.....	x

Writing in a Laboratory Notebook	x
The Big Picture.....	xi
APPENDIX E: ACTION RESEARCH ACTIVITY INSTRUCTIONS FOR COMPLETING A FUNCTIONAL BEHAVIORAL ASSESSMENT AND BEHAVIORAL INTERVENTION PLAN FOR CHANGING INAPPROPRIATE CLASSROOM BEHAVIORS.....	xii
APPENDIX F: RESEARCH LAB SYLLABI	xiv
APPENDIX G: STUDENT RESEARCHER SAFETY GUIDE	xvii
APPENDIX H: PROFESSIONAL SKILLS CHECKLIST.....	xxiii
Common Rating Items for Recommendation Letters.....	xxiii
<i>Department of Psychological Science.....</i>	<i>xxiii</i>
APPENDIX I: GRADUATE SCHOOL MENTORING CHECKLIST	xxv
APPENDIX J: LETTER OF RECOMMENDATION FORM	xxvi
APPENDIX K: INTERVIEW CAMPUS GUIDELINES	xxviii
Standard Interview Questions to Be Prepared For.....	xxx
<i>What made you apply to this program? They are trying to assess fit</i>	<i>xxx</i>
<i>What are some of your strengths and weaknesses?.....</i>	<i>xxx</i>
<i>What are your hobbies?</i>	<i>xxx</i>
<i>Can you tell me about your research?</i>	<i>xxx</i>
Stress Questions	xxx
Other Common Questions.....	xxx
Come up with various insightful questions to pose to different people, and take notes on their responses.....	xxx

WHY THIS HANDBOOK?

“How mentoring is defined determines the extent of mentoring found.”¹

There is often a chasm between what is taught in the classroom and what students need to be successful. Mentorship provides a vehicle for provoking greater expectations by students. Mentorship also provides excellent ways to gauge whether or not a student is prepared to be successful in post-baccalaureate endeavors or in the world of work. Unfortunately, mentorship remains a hidden pedagogy in undergraduate education. Institutions that place high value on mentoring build a vital bridge between the traditional classroom and the preparation experience that graduate schools, corporations, businesses, and industry demand.

This handbook contributes to the foundational knowledge on mentoring undergraduates in research. It is intended for faculty, staff, administrators, research assistants, post-doctoral fellows, academic advisors, residential advisors, and anyone engaged in mentoring undergraduates. It is not intended to be a comprehensive handbook, but offers the research base and tips to individuals beginning or engaged in mentoring undergraduates.

This handbook is a work in living document. It provides an overview of the benefits of research mentoring, mentoring theories, a discussion of barriers to mentoring, and potential strategies to overcome obstacles. The varied cadre of authors hail from a diverse groups of institutions.

Georgia College & State University (GC), the State’s public liberal arts university is located in rural central Georgia. GC is rated #4 US News and World Report’s Best Undergraduate Teaching Programs Regional Universities (South) and #9 top Public Schools Regional Universities (South).

St. Mary’s College of California is federally recognized as a minority serving institution with 51.6% students of color. St. Mary’s College is a selective, comprehensive private university that engages the intellect and the spirit with exceptional academics and not a hint of elitism.

Stetson University is a private, nonprofit university with four colleges and schools located across the I-4 corridor in Central Florida, with the primary undergraduate campus located in DeLand and the College of Law, located in Gulfport, Florida.

1 Merriam, S. (1983). Mentors and protégés. *Adult Education Quarterly*, 33(3), 161-174.

The University of Central Oklahoma prepares future leaders in an opportunity-rich environment. Located in Edmond, Central is one of the top public universities in Oklahoma City's thriving metropolitan area. The Military Times ranked UCO #21 among all surveyed four-year colleges and universities in the U.S. on its 2017 "Best for Vets: Colleges" list and is a minority serving institution with 43.3% students of color.

CHAPTER 1

BENEFITS OF UNDERGRADUATE RESEARCH MENTORING



BENEFITS OF UNDERGRADUATE RESEARCH MENTORING

Historically, mentors have been viewed as coaches and advisors. In the apprenticeship model, the mentor's responsibility is to increase the expertise and experience of the novice. When students are effectively mentored in undergraduate research and creative activity, they report ownership of the work, a deep sense of satisfaction, and high levels of self-efficacy.

The landmark Boyer Commission report called for a "reinvented undergraduate education" that would equip and prepare U.S. students to matriculate through robust post-baccalaureate degree programs and succeed in a complex, competitive workforce (Boyer Commission, 1998). In response, undergraduate research has been put forth as a high impact practice essential to developing graduates with the requisite skills to confront 21st century challenges.

In an ideal situation, undergraduate research occurs when a student works closely with faculty members or other another member of the disciplinary community on a high-quality, original research project or creative endeavor. However, resource limitations interrupt this ideal experience for many. Therefore, it is crucial that institutions of higher education harvest the essence and principles of meaningful research experiences (Council of Undergraduate Research, 2012) in order for more students to benefit. Whether students are mentored in a one-on-one approach or in a group environment, undergraduate research mentoring can offer significant benefits.

In the fall of 2015, a survey was conducted with Georgia College faculty members who served as undergraduate mentors. Here's what they had to say when asked how they've benefitted from being a mentor:

"Mentoring makes my job in the classroom easier."

Many students do not fully realize their strengths and weaknesses. Oftentimes students become more self-actualized outside of the classroom because they are in much smaller numbers. Once students have the knowledge and realize what their strengths and weaknesses are, it becomes much easier to guide them in a classroom setting. One undergraduate cohort mentor writes about taking on the responsibility in helping to assure that former students continue to be provided an environment where they are able to be successful, safe, and confident. Mentoring pays dividends across departments, disciplines, and individual cohorts.



"Mentoring makes my job worthwhile."

People in higher education sometimes look at the cup as half-empty. Faculty members spend long-hours teaching huge classes while conducting their research, writing and reading—sometimes for very little pay. Mentoring can reinforce one of the more

qualitative outcomes of a career in academia—the capacity to impact students. Responding to the survey, one professor told the story of receiving a text message from an excited student at 6 a.m. When the student shared news of landing a competitive internship, the professor was reminded of her passion for teaching and leading.

“Mentoring allows me to see things from a student perspective.”

Sometimes university employees can forget what it is like from the student perspective. Mentoring is a worthwhile way to get to know students outside of a traditional faculty/staff role. Once mentor-student relationships are formed, students are more likely to share true insight into their experiences and share their perspectives on issues in the university setting.

“Mentoring allows me to do well because my students do well.”

“I got into medical school today!” Swap “medical school” for any graduate program, post-baccalaureate program, internship opportunity, or job position that students achieve. A role of a mentor is to help them launch so that they can experience greater expectations.



“Mentoring keeps me fresh and anchored.”

Faculty members describe mentoring as a way to buffer them against stagnation. As any academic knows, apathy can be cancerous to scholarly growth as well as to the growth of students. Mentoring students reminds faculty not to “check out” when things are difficult to find but to “lean in” in the midst of administrative and departmental challenges.

Now for some perspectives from Georgia College students - when students were surveyed on how they felt they had benefitted from mentorship, they had the following to say:

“Mentoring helps me make informed career choices. I definitely think [my mentor] gave me a lot of great advice on how to better myself as a researcher and she helped me decide what I want to do in the future. I definitely think the one-on-one interaction was helpful. She gave me a lot of good advice and helped me understand the literature a little bit more.”

“I definitely feel like the relationship added to my future career because I feel like I have a lifelong advisor even after I go off to law school.”

“Mentoring increases my confidence and agency. Well little freshman me, I was completely petrified of my professors, and now I can definitely tell that I am her senior Research Scholar. I can go into her office and talk about my life, talk about more than just research, definitely. She has been a point of contact for other things, too, which is really important. It’s nice to have someone local who you can relate to a little better.”

“Mentoring provides me with support. I think it is having that one point of contact, like someone you know you can go to. It’s just really nice to have that point of contact who’s well connected throughout the campus community.”

“Mentoring created trust. I would consider [my mentor] almost a friend (in addition to a teacher student relationship) and I know she is someone I can count on even after I graduate and even when I am in law school. So I would say that increased greatly.”

“Mentoring challenges me. [I came] into every single project with a challenge that was more than the last and having that expectation that this is going to a bigger and better stage, this could be put on bigger and wider people, just knowing that you’re never going to digress in what you’re doing... was really great.”

Benefits to the Mentor

Mentoring is a mutually beneficial relationship. Mentors benefit by receiving the personal satisfaction of seeing students develop as competent colleagues. Mentor-mentee interactions increase the mentor’s own knowledge, and in institutions that value these relationships, the mentor’s standing within the organization improves. In some cases, mentoring and research productivity are closely associated but may differ from traditional faculty scholarship. Mentorship benefits mentors because it:

1. Broadens interpersonal skills,
2. demands meaningful mentor-mentee interaction,
3. develops and retains future talent,
4. expands skills and knowledge,
5. facilitates productive interactions with diverse students,
6. generates meaningful scholarship,
7. improves and enriches the instructional process, and
8. transfers “academic DNA”.

Benefits to the Student

The mentoring relationship adds to the student’s development within the discipline in ways that classroom instruction alone cannot foster. The student experiences deeper learning through practical application. Close association with a mentor improves professional disposition. Undergraduate research adds value to the student’s career trajectory by increasing student’s credentials for competitive job opportunities and admission to graduate programs (Lopatto, 2010). Other research (Elrod, Husic & Kinzie, 2010; Crowe & Brakke, 2008; Kuh, 2008; Sams, Richards, Lewis, McMullen, Hammack, Bacnik & Powell, 2016) suggests that mentorship benefits students by:

1. Broadening interpersonal skills,
2. challenging thinking in new ways,
3. connecting learning to real-world settings,
4. creating coherent context for challenging curricula,

5. developing innate potential,
6. developing leadership skills,
7. facilitating working with diverse people,
8. improving skills and dispositions,
9. increasing career awareness,
10. increasing learning gains,
11. increasing self-efficacy and self-confidence,
12. promoting transfer of knowledge,
13. providing frequent feedback,
14. requiring responses to novel situations,
15. requiring time on task, and
16. testing hypotheses and strategies.

Benefits to Higher Education

Research contributions achieved through rich faculty-student collaborations reflect positively on the reputation of higher education as a whole. Pedagogies of guided inquiry investigation and creative discovery improve the quality of undergraduate education by offering relevant experiences to students. Academic institutions offering real world, contextual research experiences ensure long-term connections with the future professional. Through undergraduate research, academia can:

1. Create intellectual communities,
2. develop and enhance internal collaborations,
3. enhance and build external partnerships,
4. enhance institutional reputation,
5. increase intellectual capacity and influence
6. strengthen recruitment and retention of students, faculty, and staff, or
7. strengthen the quality of undergraduate education.

Benefits to a Liberal Arts Institution

Many question the value of the liberal arts education in the wake of rising educational costs. Yet, over 80% of Americans embrace the liberal education ideal; they believe that the role of colleges and universities is to prepare individuals to meet the expectations of the professional world, develop responsible citizens, and prepare future leaders of society (Peter D. Hart Research Associates, 2004). Mentoring at liberal arts institutions reinforces the focus on the student as a whole in order to:

1. Confront complex, capacious problems and offer viable solutions,
2. emphasize inquiry and discovery,
3. encourage inclusive collaboration,
4. encourage social learning and responsibility, and
5. offer opportunities to challenge existing paradigms.

Benefits to Graduate Programs

New graduates require hundreds of hours to acclimate to graduate programs if they have not had adequate research preparation at the undergraduate level. Post-baccalaureate programs that accept and matriculate mentored students are more likely to experience:

1. Increased first year retention rates,
2. higher progression to graduation,
3. better student adaptability quotients,
4. increased student productivity,
5. lower resource burden for professional development, and/or
6. reduced student induction time.

Benefits to Employers

Similar to graduate programs, mentored undergraduates entering the workforce save employers significant resources for training and professional development. Students who have been mentored are found to be more productive, experience higher job satisfaction, and increased professionalism and career commitment (Bland, Taylor, Shollen, Weber-Main, & Mulcahy 2009; Fisher, 2013; Peter D. Hart Research Associates, 2007 & 2013). Organizations that hire effectively mentored graduates are more likely to experience:

1. Higher adaptability quotients,
2. higher ethical response,
3. higher retention rates,
4. increased creative/innovative outputs,
5. increased productivity,
6. lower resource burden for basic professional development, and/or
7. reduced induction training time.

Clearly, undergraduate mentorship benefits a broad span of educational and professional stakeholders. But, what exactly does undergraduate mentorship look like? Chapter #2 will propose and explore a framework for constructing a university mentorship program.

References

- Bland, C.J., Taylor, A.L., Shollen, S.L., Weber-Main, A.M., & Mulcahy, P.A. (2009). *Faculty success through mentoring*. Lanham, MD: Rowman & Littlefield Education.
- Boyer Commission on Educating Undergraduates in the Research University (1998). *Reinventing undergraduate education: A blueprint for American Universities*, Menlo Park, CA: Carnegie Foundation for the Advancement of Teaching.

- Available online at -
http://www.niu.edu/engagedlearning/research/pdfs/Boyer_Report.pdf.
- Crowe, M. & Brakke, D. (2008). Assessing the impact of undergraduate research experiences on students: An overview of current literature. *Council of Undergraduate Research Quarterly*, (4): 43-50.
- Council on Undergraduate Research (2012). *Characteristics of excellence in undergraduate research*. N. Hensel, Ed., Available online at -
http://www.cur.org/assets/1/23/COEUR_final.pdf.
- Elrod, S., Husic, D., & Kinzie, J. (2010). Research and discovery across the curriculum. *Peer Review*, 12(2): 4-8.
- Fisher, K. (2013). Marketplace: A college degree sorts job applicants, but employers wish it meant more. *The Chronicle of Higher Education*. Available online at -
<http://chronicle.com/article/The-Employment-Mismatch/137625/#id=overview>.
- Kuh, G.D. (2008). *High-impact practices: What they are, who has access to them, and why they matter*. Association of American Colleges and Universities, Washington DC, Available online at -
http://www.neasc.org/downloads/aacu_high_impact_2008_final.pdf.
- Lopatto, D. (2010). Undergraduate research as a high-impact student experience. *Peer Review*, 12(2): 27-30.
- Peter D. Hart Research Associates (2007). How should colleges prepare students to succeed in today's global economy? *National Poll*. Available online at -
<http://www.aacu.org/leap/documents/Re8097abcombined.pdf>.
- Peter D. Hart Research Associates (2013). It takes more than a major: Employer priorities for college learning and student success. Available online at -
http://www.aacu.org/leap/documents/2013_EmployerSurvey.pdf.
- Sams, D., Richards, R.A., Lewis, R., McMullen, R., Hammack, J., Bacnik, L., & Powell C. (2016). Mentorship as a value proposition (MVP) to the competitive global marketplace: Empirical study. *International Journal for the Scholarship of Teaching and Learning*, 10(2): 7.

CHAPTER 2

WHAT DOES UNDERGRADUATE RESEARCH LOOK LIKE?



WHAT DOES UNDERGRADUATE RESEARCH LOOK LIKE?

Boyer's model (1998) identifies four pillars of scholarship: (1) discovery, which involves the creation of and dissemination of novel ideas within an established field; (2) integration, where research is summarized across disciplines; (3) application, which involves serving one's community and profession; and (4) teaching, where learning theory and mentorship meet. Although the "discovery" arm of scholarship is most often the dominant paradigm, Boyer proposes significant value to educational pursuits when other aspects of scholarship are considered.

The Boyer ethos offers a model for undergraduate research, which takes multiple forms depending on the discipline and the goals—from empirical community service projects to graded classroom activities to intensive creative endeavors and an array of practices in between. Likewise, the outcomes of mentored undergraduate research range in scope from posters (see Appendix C) and oral presentations to works of art, plays and poetry, musical scores, to journal articles, and so forth. The artifacts of research, such as proposals (e.g. research, grant, IRB), surveys, literature reviews, iterative models, etc., are just as important as they demonstrate evidence of scholarship and learning. In addition, a range of methods exist for summarizing and disseminating research, such as implementation of collaborative community-based service projects, multimedia presentations, program reviews, and websites. The definition of mentoring is consistent regardless of the UR methodology.



What is Mentoring? Who are Mentors?

According to Bozeman & Feeney (2007), "The few formal, stipulated definitions provided in the mentoring literature sometimes do not have the coverage or plasticity required for research to move easily to new topics." In their review article, they present an extensive list of definitions of mentoring and mentors. Some common themes emerged: the importance of experience, the sharing of knowledge, the difference in power dynamics, and the notion that mentoring is a deliberate and formal relationship.

Mentoring is...

"...a developmental relationship that involves organizational members of unequal status or, less frequently, peers" (Bozionelos, 2004).

"...an intense long-term relationship between a senior, more experienced individual (the mentor) and a more junior, less experienced individual (the protégé)" (Eby & Allen, 2002).

"...[a relationship that] facilitate[s] junior colleagues' (protégés) professional development and career progress" (Tepper, 1995).

"...a transformational activity involving a mutual commitment by mentor and protégé to the latter's long-term development, as a personal, extra organizational investment in the protégé by the mentor, and as the changing of the protégé by the mentor, accomplished

by the sharing of values, knowledge, experience, and so forth” (Scandura & Schriesheim, 1994).

Mentors are...

“...a more senior person who takes an interest in sponsorship of the career of a more junior person” (Smith, Howard, & Harrington, 2005).

“...individuals with advanced experience and knowledge who are committed to providing upward support and mobility to their protégés’ careers” (Singh, Bains, & Vinnicombe, 2002).

“...a supportive relationship established between two individuals where knowledge, skills and experience are transferred from the mentor to the mentee or protégé” (Chao, 1997).

“... individuals with advanced experience and knowledge who are committed to providing upward mobility and support to protégés’ careers” (Ragins, 1997).

“...a senior, experienced employee who serves as a role model, provides support, direction, and feedback to the younger employee regarding career plans and interpersonal development, and increases the visibility of the protégé to decision-makers in the organization who may influence career opportunities” (Noe, 1988).

“...a person who oversees the career and development of another person, usually junior, through teaching, counseling, providing psychological support, protecting, and at times promoting or sponsoring. The mentor may perform any or all of the above functions during the mentor relationship” (Zey, 1984).

Mentoring Scholarship Overview

Research on the conceptualization of mentoring took off in earnest in the late 1970’s (e.g., Kram, 1980; Levinson, Darrow, Klein, Levinson, & McKee, 1978). However, the dissertation work of Kathy Kram (1980) is considered a seminal piece in business mentoring and her 1983 Academy of Management Journal article (Kram, 1983) is still the most frequently cited publication on mentoring (Bozeman & Feeney 2007). In 1991, Whitely, Dougherty, and Dreher introduced primary mentoring, defined as an intense longitudinal relationship. Scandura (1992) developed measures for the multidimensional construct of mentoring. Chao, Walz, and Gardner (1992) conceptualized two type of mentoring – formal and informal. By 1997, Ragins introduced the concepts of diversity and power relationships into the mentoring literature, and Eby (1997) expanded the Kram theory by focusing on peer mentoring rather than the hierarchical mentor-mentee model. According to Eby, “Mentoring is an intense developmental relationship whereby advice, counseling, and developmental opportunities are provided to a protégé by a mentor, which, in turn, shapes the protégé’s career experiences... This occurs through two types of support to protégés: (1) instrumental or career support and (2) psychological support” (p. 126).

Mentoring is closely related to coaching and apprenticeship. At its foundation, mentoring is the transmission of knowledge from one person to another (Sams, Richards, Lewis, McMullen, Hammack, Bacnik, & Powell, 2016). Therefore, separating the

operationalization of its function from coaching and apprenticeship presents an interesting challenge. As such, since its early roots in the 1980s, there has been limited progress in the development of theory on mentoring as a unique activity. Between 1987 and 1997, more than 500 articles on mentoring were published in education and management alone; yet, the refinement of underlying mentoring philosophy did not significantly change over time. Russell and Adams (1997) proposed that the absence of theory-driven research is the result of small sample sizes and limited samples with the focus on correlations versus causal explanations.

Woven throughout the mentoring literature is the importance of communication between the mentor and mentee towards advancing mentors' pedagogical expertise (Christophel & Gorham, 1995; Kelley & Gorham, 1988; Kearney, Plax, & Burroughs, 1991; McCroskey & Richmond, 1987). Since 1997, the academic literature has focused on modalities of mentoring (how to: e.g., Abdel-Qader, 2004), the stakeholders (the who: e.g., Colucci-Rios & Briano, 2001), and the outcomes of mentoring (e.g., Cox & Andriot, 2009). Consequently, undergraduate research has benefited substantially both from early literature on mentoring and from new knowledge on mentoring undergraduate researchers.

Mentoring Philosophies and Related Theories

Arousal Theory: Arousal theory suggests that people are driven to perform actions in



order to maintain an optimum level of physiological arousal. Mentors rely on arousal theory to explain the role of mentor nonverbal immediacy in the learning process (Christophel & Gorham, 1995; Kelley & Gorham, 1988). In one study, Christophel and Gorham (1995) found that proximity aroused students to direct their attention toward learning the content. In this way, students' motivation to engage in task-related activities was enhanced and deeper student learning was achieved.

Attribution Theory: Attribution theory focuses on the processes by which we construct, interpret, and identify causes of our own behavior and that of others. Kearney, Plax, and Burroughs (1991) used attribution theory to explain students' decisions about resisting their mentor's control attempts. Kearney et al. (1991) found that students selected different strategies for resisting mentors based on their attributions regarding problem ownership – that is, whether students attributed course problems to mentors or to themselves.

Expectancy Learning/Learned Helplessness: This theoretical perspective posits that individuals learn to predict or expect positive or negative outcomes of their own behavior over time. Learned helplessness results when behavioral consequences are random; therefore, are impossible to predict. McCroskey and Richmond (1987) first used this theoretical framework for predicting and explaining communication apprehension, setting the stage for a long line of theoretically informed research on

communication anxiety (e.g., Chesebro, McCroskey, Atwater, Behrenfuss, Cawelti, Gaudino, & Hodges, 1992; Rosenfeld, Grant, & McCroskey, 1995).

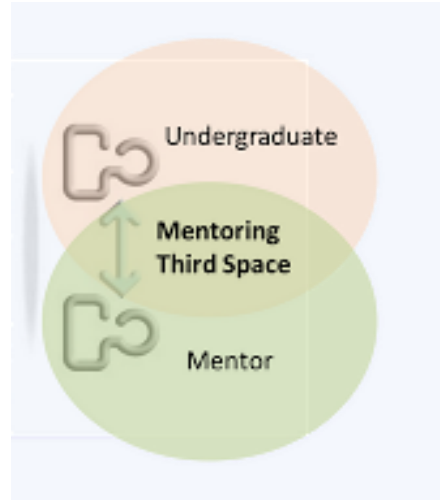
Keller's ARCS model of Instructional Design: Keller's (1983, 1987) ARCS model proposes that mentors who make content relevant to students' lives or goals increase students' motivation to learn. More specifically, Keller contends that four conditions must be met for learning to occur. First, the mentor must gain the student's attention (A). Second, the content must be relevant (R) to students' needs. Third, students must have confidence (C) in their ability to accomplish the task; and fourth, students must be satisfied (S) with the results in their efforts. In one instructional communication study, Frymier and Shulman (1995) found support for Keller's paradigm. Their findings indicated that the more effectively mentors were able to communicate relevance in their instruction that the more motivated students were to learn.

Mentoring Third Space: Successfully mentored research experiences traditionally engage students in a zone of proximal development (Vygotsky, 1978) where a rich mixture of professional and personal development occurs. Students at the outer edge of this zone begin constructing awareness of signature skills and dispositions as a result of observation. Within the zone, students enter a mentoring third space defined by explorations of inner intellect, self-efficacy and meta-cognition. According to Whitchurch (2008), "...as a result of blurring boundaries between activities, what might be described as third space has emerged between professional and academic domains" (p. 384). The mentoring third space (Richards, 2012) is the location where the mentee and mentor become partners and where the integration of knowledge moves the undergraduate into the community of practice where optimized academic dispositions are attained (see Figure 1 below).



Successfully mentored research experiences traditionally engage students in a zone of proximal development (Vygotsky, 1978) where a rich mixture of professional and personal development occurs. Students at the outer edge of this zone begin constructing awareness of signature skills and dispositions as a result of observation. Within the zone, students enter a mentoring third space defined by explorations of inner intellect, self-efficacy and meta-cognition. According to Whitchurch (2008), "...as a result of blurring boundaries between activities, what might be described as third space has emerged between professional and academic domains" (p. 384). The mentoring third space (Richards, 2012) is the location where the mentee and mentor become partners and where the integration of knowledge moves the undergraduate into the community of practice where optimized academic dispositions are attained (see Figure 1 below).

Figure 1: Undergraduate Research Mentoring as Relationship Pedagogy



Socratic Philosophy: Socrates questioned his students in an unending search for truth. He sought to grasp foundational understanding of his students' and colleagues' views by continuously probing until a contradiction was exposed; thus, proving the fallacy of an initial assumption. This approach became known as the Socratic method and is recognized as Socrates' most enduring contribution to philosophy. Pedagogical techniques where an educator engages in questioning versus delivery of content is considered Socratic. The desired outcome is for the student to arrive at an understanding through reflective response or to deeper awareness of the limits of her knowledge. This philosophy is a key to mentoring in which the mentor provides tools and encouragements, guiding the mentee to the answers.

References

- Abdel-Qader, I. (2004). An Undergraduate Research Mentoring Model in Digital Signal and Image Processing. *International Journal of Electrical Engineering Education*, 41(2): 146.
- Boyer Commission on Educating Undergraduates in the Research University (1998). *Reinventing undergraduate education: A blueprint for American universities*, Menlo Park, CA: Carnegie Foundation for the Advancement of Teaching. Available online at - <https://eric.ed.gov/?id=ED424840>
- Bozeman, B., & Feeney, M.K. (2007). Towards a useful theory of mentoring: A conceptual analysis and critique. *Administration & Society*, 39(6): 719-739.
- Bozionelos, N. (2004). Mentoring provided: Relation to mentor's career success, personality, and mentoring received. *Journal of Vocational Behavior*, 64(1): 24.
- Chao, G. T. (1997). Mentoring phases and outcomes. *Journal of Vocational Behavior*, 51(1): 15-28.
- Chao, G.T., Walz, P.M., & Gardner, P.D. (1992). Formal and informal mentorships: A comparison on mentoring functions and contrast with non-mentored counterparts. *Personnel Psychology*, 45(3): 619-937.

- Chesebro, J.W., McCroskey, J.C., Atwater, D.F., Behrenfuss, R.M., Cawelti, G., Gaudino, J.L., & Hodges, H. (1992). Communication apprehension and self-perceived competence of at-risk students. *Communication Education*, 41: 345-360.
- Christophel, D. M. & Gorham, J. (1995). A test-retest analysis of student motivation, teacher immediacy, and perceived sources of motivation and demotivation in college classes. *Communication Education*, 44: 292-306.
- Colucci-Rios, J.A. & Briano, J. (2001). Sloan Foundation Scholarship Program: Mentoring undergraduates towards doctoral degrees. *Journal of Engineering Education*, 90(3): 295-298.
- Cox, M. F. & Andriot, A. (2009). Mentor and undergraduate student comparisons of students' research skills. *Journal of STEM Education*, 10: 31-39.
- Eby, L.T. (1997). Alternative forms of mentoring in changing organizational environments: A conceptual extension of the mentoring literature. *Journal of Vocational Behavior*, 51(1): 125-144.
- Eby, L.T. & Allen, T. D. (2002). Further investigation of protégés' negative mentoring experiences patterns and outcomes. *Group & Organization Management*, 27(4): 456-479.
- Frymier, A.B. & Schulman, G.M. (1995). What's in it for me? Increasing content relevance to enhance student motivation. *Communication Studies*, 50: 1-12.
- Kearney, P., Plax, T.G., & Burroughs, N.F. (1991). An attributional analysis of college students' resistance decisions. *Communication Education*, 40: 325-342.
- Keller, J.M. (1983). Motivational design of instruction. In C.M. Reigeluth (Ed.), *Instructional Design Theories and Models*. (pp. 383-433). New York: Lawrence Erlbaum Associates.
- Keller, J.M. (1987). Strategies for stimulating the motivation to learn. *Performance and Instruction*, 26(8): 1-7.
- Kelley, D.H. & Gorham, J. (1988). Effects of immediacy on recall of information. *Communication Education*, 37: 198-207.
- Kram, K.E. (1980). Mentoring processes at work: Developmental relationships in managerial careers. *Unpublished Dissertation*, Yale University, Cambridge, MA.
- Kram, K.E. (1983). Phases of the mentor relationship. *Academy of Management Journal*, 26(4): 608-625.
- Levinson, D., Darrow, C., Klein, E., Levinson, M., & McKee, B. (1978). *The seasons of a man's life*, New York: Alfred A. Knopf.
- McCroskey, J.C. & Richmond, V.P. (1987). *Willingness to communicate*, In J.C. McCroskey, & J.A. Daly (Eds.), *Personality and Interpersonal Communication* (129-156). Newbury Park, CA: SAGE Publications.
- Noe, R.A. (1988). An investigation of the determinants of successful assigned mentoring relationships. *Personnel Psychology*, 41(3): 457-479.
- Ragins, B. R. (1997). Diversified mentoring relationships in organizations: A power perspective. *Academy of Management Review*, 22(2): 482-521.
- Richards, R. (2012). "Undergraduate research mentoring," Available online at - <http://www.blogger.com/blogger.g?blogID=1352031052436049626#editor/target=post;postID=2911570489304235294;onPublishedMenu=overview;onClosedMenu=overview;postNum=19;src=postname>.

- Rosenfeld, L.B., Grant, C. H., & McCrosey, J.C. (1995). Communication apprehension and self-perceived communication competence of academically gifted students. *Communication Education*, 44: 79-86.
- Russell, J.E.A. & Adams, D.M. (1997). The changing nature of mentoring in organizations: An introduction to the special issue on mentoring in organizations. *Journal of Vocational Behavior*, 51(1): 1.
- Sams, D., Richards, R.A., Lewis, R., McMullen, R., Hammack, J., Bacnik, L., & Powell, C. (2016). Mentorship as a value proposition (MVP) to the competitive global marketplace: Empirical study. *International Journal for the Scholarship of Teaching and Learning*, 10(2): 7.
- Scandura, T. A. (1992). Mentorship and career mobility an empirical-investigation. *Journal of Organizational Behavior*, 13(2): 169-174.
- Scandura, T. A., & Schriesheim, C.A. (1994). Leader-member exchange and supervisor career mentoring as complementary constructs in leadership research. *Academy of Management Journal*, 37: 1588-1602.
- Singh, V., Bains, D., & Vinnicombe, S. (2002). Informal mentoring as an organizational resource. *Long Range Planning*, 35(4): 389.
- Smith, W.J., Howard, J.T., & Harrington, K.V. (2005). Essential formal mentor characteristics and functions in govern- mental and non-governmental organizations from the program administrator's and the mentor's perspective. *Public Personnel Management*, 34(1): 31-58.
- Tepper, B. J. (1995). Upward maintenance tactics in supervisory mentoring and non-mentoring relationships. *Academy of Management Journal*, 38(4): 1191-1205.
- Whitely, W., Dougherty, T. W., & Dreher, G.F. (1991). Relationship of career mentoring and socioeconomic origin to managers and professionals early career progress. *Academy of Management Journal*, 34(2): 331-351.
- Zey, M.G. (1984). *The mentor connection*, Homewood, IL: Dow Jones-Irwin.

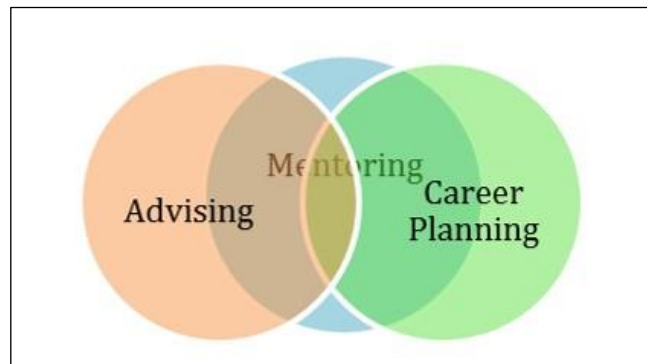
CHAPTER 3
PROFESSIONAL DEVELOPMENT



PROFESSIONAL DEVELOPMENT

Professional, personal, and career development are natural outcomes of the mentoring process. Figure 2 illustrates a simple representation of faculty and staff interactions with students, which often involve a vital combination of academic advising, mentoring, and career planning. Determining the most appropriate combination is student-dependent. The projects students work on, the skills they learn, and the contact that they have with mentors outside of a traditional classroom space all contribute to post-graduation success (Miller, 2002).

Figure 2: Faculty and Staff Interactions



Advising for Graduation and Beyond

Undergraduates desire to attain a degree and realize career ambitions. Advising plays a critical role in achieving these goals and the type of advising may differ depending on the desired outcome. Mentors may find themselves engaged in two types of advising: (1) advising for graduation and (2) advising for success.

A common trend in higher education is the development of professional advising centers with a goal to increase undergraduate retention and graduation rates. Some professional advisers oversee transition functions for students, especially those who have not decided on a major. Others focus on matriculation processes. Is the student taking the appropriate courses in the first year? Does the student have enough science credits to fulfill the degree requirements at the university? How many upper division hours does a student need to earn to graduate? Professional advisers with academic advising focus reduce faculty workload in the role of advising for graduation. On the other hand, some centers advise for success by providing a full range of academic and career planning resources and tools to help students make informed decisions to achieve their academic, career, and life goals.

At institutions where the professional advising resource is scarce, faculty may assume dual roles of advising for graduation and success. When the student receives psychosocial, academic, professional, and career advisement, this might constitute mentoring. Students frequently enjoy advisement from one or more members of the

faculty and staff and the nature of the advisement ranges from personal to academic to professional and combinations of each. However, it is the role of the mentor to evaluate and determine the type of advising required by the student to ensure appropriate advisement occurs from the appropriate source.

Post-Baccalaureate Planning

One mentoring consideration is assessment of a mentee's future planning. What activities can they participate in during their first, second, third, and fourth year to plan their placement? Are they taking advantage of summer months to find opportunities related to their plans? If they have to work, what project or work opportunities are available to provide critical experiences to enhance their talents and skills? Do they have a post-graduation plan? Is a graduate program part of the plan? Is that program similar or dissimilar to the mentor's area of study? Do they wish to enter the job market?

In a Ph.D. mentorship model, the goals of a mentee may deliberately align with that of the mentor in terms of research interest and career choice. In many cases, students enter graduate programs to develop the requisite experiences, skills and dispositions to create their own pathway. A mentor's role will be to provoke, stimulate, and support greater expectations and possibilities by the mentee.

The following list includes some general guidelines and considerations for some of the duties and responsibilities mentorship may encompass.

Development of Life Skills

Goal Setting: It is important that students enter the research environment with "eyes wide open" and receive clear expectations of duties and workload associated with the project (Mickley, Kenmuir, & Remmers-Rober, 2003). Mentors should assist mentees with goal setting.

Communication Regarding Progress: Mentors should have a straightforward conversation about what students can accomplish and improve upon throughout their time in order to better achieve their goals. Mentors should be explicit, creating collaboratively reasonable benchmarks for progress and deliverables that fulfill their standards and expectations. This may involve having conversations that assess the student's need for improvement in certain areas. These conversations can be professional in nature or personal; professional mentoring often intersects with personal issues (Buell, 2010). Providing experiences that foster success will better enable mentors to write honest, positive letters of reference for students. See Appendix H for checklists that can assist students through self-reflection on areas requiring improvement.



Professionalism and Maturity: Mentors should provide experiences for mentees to grow their professional dispositions. What opportunities will they have to interact with peers, faculty, staff, administrators, community members, business, industry/government professionals to showcase their craft? What classroom or research experiences are fostering their communication skills? How often do they have opportunities to work in teams and with people who are different from them (diverse)? Approaching a faculty member for a conversation; dressing professionally; crafting professional e-mails; communicating effectively; giving professional presentations; how to address a professional in the field—these are all acquired skills, and students may need specific (even pointed) instructions.

Leadership Development: In addition to opportunities inherent in the research environment for promoting leadership, mentors should find specific opportunities to enhance leadership in mentees. Peer mentoring, for example, fosters valuable leadership by students. Mentors can identify leadership qualities in mentees and hone these skills by assigning specific tasks and roles.

A Code of Ethics: Mentors should promote ethical behavior in professional environments. Ethical behavior should be scaffolded through implementation of research planning, use of other's work, citation of sources, etc. Mentors should be consistent about their codes of ethics. Students look to their mentors to model ethical behavior. See Chapter 4 for more specific information about ethical mentoring.

Community Service and Engagement: Mentors might encourage students to participate in service learning that uses their skills, talents, and knowledge to serve the community. Mentors should provide as many opportunities as possible for mentees to see their role as productive, socially responsible citizens of community. Community work not only fosters community building but resume-building as well.

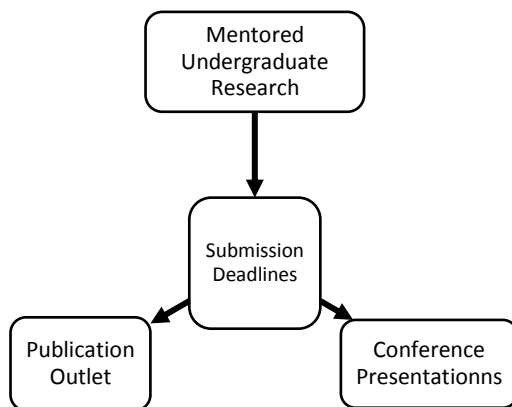
Presenting Research

Facilitating Opportunities: Awareness of opportunities for students to develop their skills or to present their research and creative projects is a key component of facilitating professional development.

Most opportunities have strict deadlines for submission; in some cases, six to eight months before the event. Therefore, timing is critical. For example, how might a specific timeline influence senior students in terms of travel support requirements if no longer enrolled at the institution? Might the opportunity be more prudent for juniors? Mentors should consider options for students at each level of their research development and academic rank (See Figure 3 below). For example, a senior student may be in a position to submit a publication and not a presentation. Often, undergraduate research conferences and smaller regional or statewide conferences have a more reasonable submission deadline for students wishing to present research, meaning that students can have the opportunity to present research without having to complete the project months in advance. In addition, undergraduate research conferences also can

sometimes allow for submission of works in progress, where projects do not have to be completed in full in order to be submitted. This can sometimes be a bit of a gamble, but can be a real boon when a student is in the middle of data collection.

Figure 3: Publication Structure



Chapter 8 offers a list of resources specific to Georgia College for obtaining funding for purposes of presenting student research at conferences and Appendices A and B provide a list of funding and national conferences sources.

Promising classroom projects can sometimes be developed into a conference-worthy presentation – and with adequate planning and preparation, one can make conference presentations a class requirement. Likewise, there can sometimes be much more modest methods of presentation, including formal class presentations and papers, presenting to the client (community partner), presenting work at a department-wide or school-wide “research fair”, or submitting papers for publication in the school journal (i.e. Georgia College’s *The Corinthian*). By being aware of opportunities, or perhaps creating their own in the classroom and department, mentors can give student researchers greater exposure, and act as an ambassador for their work.



Evidence of Research and Creative Endeavor: How can students provide evidence of their work if they have not engaged in a specific showcase or dissemination opportunities (conference presentations, exhibitions, productions, publications, reports)? – A key role of the mentor is to provide students with relevant citations of their work from grants, conference presentations, manuscript submissions, or showcase event to assist the development of their professional materials (statement of purpose, resume, etc.).

Students can sometimes find it difficult to reflect and critically assess their accomplishments while in a research setting. As such, they may not recognize their

development during their time working with the mentor. Helping them articulate their roles, responsibilities, skills, leadership, and professional dispositions acquired as part of their research experience is a worthy exercise, perhaps through the writing of a reflection paper.

Mentors in the field will be familiar with the style resume that students need to use to be the most successful in applying for jobs and/or graduate schools. Since this differs from field-to-field, specific career advisement from a career center or relevant colleague might be useful. Career centers often offer one-on-one counseling, resume workshops, etc.

Academic Advising

Scheduling: So much of being successful in college is balance. Most undergraduates do not realize this, so when they schedule their classes they will oftentimes be more worried about the times and days of the schedule than the balance of the subjects. Mentors should always have their students make a list of strengths and weaknesses and try to balance classes based on that list. For example, if a mentee is strong in math in science and weak in History and English they might consider pairing all math classes with English classes to balance (History and Science). Once core classes are completed it becomes a matter of balancing workload. There are classes within each field that are more work intensive than others; thus, everyone in the field should know which ones they are. Mentors should make sure that a mentee does not take too many of those during any one semester. A personal SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis is often helpful. Once the student identifies his or her personal strengths (e.g., strong analytical skills) and weaknesses (e.g., disorganized) and his or her external threats (e.g., job obligations) and external opportunities (e.g., a conference being offered that aligns with his or her research schedule) he or she will be better able to determine the proper research path for them.

Most mentors want their mentee to experience undergraduate research in some form before they leave the university environment. The question is, what is the best for the student's resume and career plan? The mentor and mentee can decide together upon a list of "must haves" for the mentee's transcript.

Class Selection: Frequently when selection committees are evaluating candidates for places in graduate programs they look at the student's transcript. One of things they consider is how many classes the student took in their field of study and the breadth and variety of class that took in that field. Mentors should encourage students to use their electives wisely, bearing in mind that a key function of a mentor is to ensure that mentees are prepared for be successful in graduate school or in the world of work.

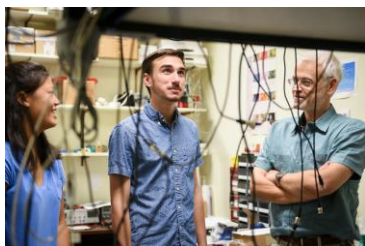
Grade Point Average (GPA): GPA is one of the most important factors to any graduating college student, whether they are applying for a job or applying to professional or a graduate school. Mentees should know that if they do very poorly in a class, they have the option of retaking the class to modify their GPA. Mentors should

also pay close attention to the drop date for classes; if their mentees are doing poorly and have less than the university approved W's (withdrawals from a class), they should suggest that the student drop the class so there is no academic penalty. A few bad grades on a student's transcript can rob a student of a scholarship, a job or the opportunity to go to graduate school.

Field-Specific Professional Development

When students wish to go further in the mentor's particular area of study and pursue an advanced degree, the mentoring process they might receive is often reflective of the mentor's own academic journey. Students may have questions about which graduate programs would be best for them to apply to, and a mentor's advice can be invaluable, as can their professional connections. This is often a much more straightforward mentoring experience, as a student can easily apply their research experience to their application materials.

Mentors should present a balanced view of their chosen field. Certain fields are often confused by outsiders or glamorized by the media, and it can be especially difficult for



you to separate those students who have a serious interest in the field from those with a passing fancy. Although clearly it is important to share a love for the field with all students, ultimately faculty should help each student to find where he or she belongs, even if it is not in a particular field. Sometimes this can be the most difficult part of job. Clearly, in fields that require graduate or professional school students must be able to earn the grades and test scores to get into those schools. Sometimes this means that mentors must be candid with students about their grades and chances in a given field and help them explore other related options.

Mentors are uniquely suited to help mentees learn about their fields to demystify the minefields, the trends, the professional connections, jargon, and how to pick an appropriate graduate program. Mentors should not expect students to know these things intuitively, or to pick them up through osmosis.

Encouraging students to engage in activities with discipline-specific pre-professional programs can also be useful, as upper-classmen can show lower-classmen "the ropes." Pre-professional organizations are important for forming study groups, networking (social and professional), and for learning from peers, as well as providing leadership and service opportunities. Below are some additional questions for mentors to consider:

- Do you see the student in question as having a successful experience in your particular area? If not, what could you do to better help them succeed? Would it serve the mentee better to redirect him or her to an area that would better fit their interests and goals?

- Does your mentee love this subject and really need to be a professional in this field?
- Sharing insights regarding your field (and academia) can provide students with a sense of context and direction. Be open about the employment opportunities available to professionals with your type of degree, as well as what students can expect to experience during graduate school.

General Professional Development

Clearly when discussing a mentee's future, mentors must discuss all of the possibilities. Graduate school is not for everyone. Especially in today's economy, not everyone is ready to make the jump into the great unknown and borrow tens of thousands of dollars to invest in a graduate education they may or may not be able to use. The student loan crisis of 2012 made many students wary to take out more loans, especially with the economy slow to rebound and growth in the job market slow to non-existent. In a bad economic time; however, mentors should talk alternative options for some students like part-time programs that allow students who already have jobs to enhance their worth to keep their job security.

The university's Career Center is also an excellent resource for résumé development, and career advisors can provide additional strategies for discussing research experiences to potential employers.

Unlike graduate programs, not all undergraduate mentees will go on to receive a Ph.D. in the mentor's particular area. (In fact, the majority of them will not!) If a mentee is not planning on going into the mentor's particular area of study, or has decided to go on the job market, the mentor may have to discuss with the mentee about how their experiences doing research can translate to a non-research environment, or another area of study. Generating a list of skills that could be useful in a workplace environment would be one possible approach. Talking with the mentee about how to verbalize their research experience in terms of more general skills such as critical thinking, responsibility, maturity, leadership, and problem solving (Reilly, 1992) can also be useful.

Graduate School Preparation

Testing, Testing, 1, 2, 3: Tips to Help Mentees

Starting with a "Dry Run": This is probably the most over-looked step in the testing process—but the most critical! Students cannot begin to study for a test if they have no idea where their academic weaknesses are. It's a very good idea to require mentees to take the entrance test they are required to take at least once under testing conditions (quiet, no unnecessary breaks, in the morning) without studying as a dry run. If they take the



test more than once, they will get a better idea of the validity of the score. Once there is a base line of the mentees' "natural ability" on the test, mentors can analyze with them what they missed and formulate a personalized study plan and schedule. This is where a pre-professional organization is optimal. Ideally, these organizations will have a study group for each part of the test operating throughout the academic year.

How to Study: All of the entrance tests have their "tricks", whether student is taking the GRE, GMAT, LSAT or MCAT. The common denominators are studying as much as possible and starting as early as possible. If they start early, the study sessions can be smaller and more relaxed; they can develop a routine of studying for their graduate entrance test and work that routine into their college lives. The longer they wait to start studying, the longer the sessions, the more frequent, and the more intense—this leads to unnecessary stress, which leads to lower test scores.

Study Groups: Many college students express that they prefer not to study in groups. In particularly competitive fields this is understandable; faculty pit students against each other and do not encourage collaboration. Mentors need to explain to them in college that many pre-professional and graduate programs hinge on group work. A study group can be a great tool for undergraduates to gain confidence, expand knowledge, and garner innovation in their effort to succeed on entrance tests. Many times students learn more outside that classroom than inside the classroom.

Specialized Study Plan: It is best for every student to know early on what their strengths and weaknesses are and to use those to their advantage. A specialized study plan will focus on utilizing a student's strengths and addressing their weaknesses. If a few students have components of their plans that are similar in certain areas, then encourage group study.

When Should Mentees Take the Entrance Test?

Most entrance tests are offered at least four (4) times or so throughout the year (LSAT): some can be taken at any time (GRE). So what is the best time to take the entrance test for graduate school if a student is seeking admission in the fall semester? A good rule of thumb is to make sure that the student does not earn his or her first score too late in the graduate school application process. Be sure he or she has enough time to retake the test (and get the scores back) comfortably before the deadline to apply for schools.

Should a Mentee Take the Test Again?

This of course depends on a myriad of factors, finances only being one (those tests can be expensive). These are some of the reasons taking the practice tests become so important.

- Is the outcome likely to change? Were there any factors that likely had an effect on the performance of the mentee?

- If the outcome changes, how likely is it to make a significant difference? If the mentee is only likely to improve marginally and that will not be a motivating factor for the admissions board, he or she should not take the test again.
- Do they average test scores or take the highest score? This is something the mentee must know about the schools they are applying to. If he or she takes the test again and the school averages the scores, it might actually be detrimental to getting into graduate school.

LSAT Preparation Example: Of all of the entrance tests, the LSAT might be the exam that people talk about the most. A recent study of the LSAT indicates it might not even be a valid indicator of future student success in law school (there is only a moderate correlation between high LSAT scores and high 1L grades) (Stilwell, Dalessandro, & Reese, 2011). The American Bar Association (ABA) has even considered the possibility of replacing the test (Weiss, 2011). However, almost all school requires that applicants take the LSAT to be considered for admissions. Historically the biggest problem for students taking the LSAT is that it is not a content-based test. The student cannot “study” for the LSAT in the traditional way they study for tests. Since the LSAT measures intellectual ability and not merely knowledge, it makes preparing for the LSAT very difficult.

The Following are Suggestions for Students Planning to take this Test: increase reading in subject matter, intensity, amount, and speed. This will help on the reading comprehension section of the test. Recommend that the mentee take a class in critical and logical thinking (these are very often taught in philosophy departments). This will help in the logical reasoning section of the LSAT. If the university offers a legal research and writing class recommend your mentee take it to help with the writing section of the LSAT. Most students have the hardest time with the logic games. It is suggested that the student attempts to retrain his or her brain on how to think about these scenarios—make them games. Many of the scenarios are very similar to brain teasers. It is a good idea to suggest that the student obtain a book of brainteasers and suggest that the he or she makes it a habit to work through a few several times a week. Once they become commonplace, their brain will retrain itself to think in a more efficient, logical way to solve the puzzle.

Appendix I provides a related checklist that mentors and mentees can complete together as they talk about specific components of preparing for graduate school applications.

Picking Programs

Mentors should assist students in looking at the “big picture” when determining the graduate program of choice. Although the quality of the program is an important factor, mentees often need help assessing other considerations such as:

- Access to things of personal importance churches, schools, theatres and other colleges
- costs
- crime rate
- cultural identity of the city/town
- employment opportunities
- local weather conditions
- national vs. international schools
- proximity to family and/or support system
- region/location
- scholarships
- transportation access/ease
- urban/rural setting

Students may need specific advice about the number of program applications to submit, “red flags” to watch for (e.g. lack of professional accreditation or bad reputation), and other discipline-specific contexts. For example, will the student work with a specific adviser or is the student applying broadly to the program as a whole? Will the student receive the training that will advance their specific career goals? Review résumé drafts, personal statements, and professional e-mails to ensure that they focus on the goals of the specific programs. When interviews are granted, mentors should help mentees prepare for the unknown. (See Appendix K for useful interview guidelines).

Letter Writing

It is important that mentees are aware that simply participating in research does not guarantee they will receive a glowing letter! Mentors should work with students to make sure expectations and standards are clear.

Furthermore, students may be unaware of letter writing protocol. Mentors should ensure that students know a mentor’s personal requirements for requesting a letter – how much time you need, general etiquette when a student is planning to ask for a letter (i.e. “I expect you to make any requests in-person”), and ongoing expectations for what the student will provide his or her letter is being prepared. See Appendix J for some examples of formats for requesting letters of recommendation.

Research mentors have unique insight on mentees’ strengths and weaknesses. Further, they will be in a position to discuss their intellectual capabilities, research skills, leadership, maturity, written and oral skills, and knowledge about the discipline/topic area, and their capacity for advanced work.

References

Buell, C (2010). Models of mentoring in communication. *Communication Education*. 53(1): 2004.

- Mickley, G. A., Kenmuir, C., & Remmers-Rober, D. (2003). Mentoring undergraduate students in neuroscience research: A model system at Baldwin-Wallace College. *The Journal of Undergraduate Neuroscience Education*, 1(2): A28-A35.
- Miller, A. (2002). *Mentoring students and young people: A handbook of effective practice*, London: Kogan Page.
- Reilly, J. M. (1992). *Mentorship: The essential guide for schools and business*, Australia: Hawker Brownlow Education.
- Stilwell, L. A., Dalessandro, S. P., & Reese, L. M. (2011). Predictive validity of the LSAT: A national summary of the 2009 and 2010 LSAT correlation studies. *LSAT Technical Report Series, Law School Admission Council*. Retrieved from <http://www.lsac.org/docs/default-source/research-%28lsac-re-sources%29/tr-11-02.pdf?sfvrsn=2>
- Wiess, D. C. (2011). LSAT Would Be Optional Under Possible ABA Accreditation Change. *ABA Journal*, Retrieved from: http://www.abajournal.com/news/article/lsat_would_be_optional_under_possible_aba_accreditation_change.

ETHICS AND UNDERGRADUATE RESEARCH

Perceptions of the word “ethics” may vary widely across disciplines. An engineer may associate the term with professional codes of ethics (i.e., honesty and integrity), while a biologist may think of working with research animals. A teacher, on the other hand, may connect the term with students, or human subjects. In any field, ethical considerations can make or break a researcher’s reputation and career. It is never too early or too late to introduce ethics. Regardless of the discipline, ethics in all its forms is an important subject to be taught to mentees.

Ethical Mentoring

First and foremost, when engaging in mentoring, there are various considerations that should be in place to promote healthy, appropriate relationships with mentees. Establishing and maintaining clear boundaries between the mentor and mentee is an important initial step in the mentoring process. Likewise, mentors should avoid abuses of power – such as exploitation of a mentee’s time, resources, and work. Mentors should remember that a student’s academic future can be deeply impacted by a mentoring relationship. This level of influence comes with a considerable degree of power, and must be responsibly handled.

Ethical Research Resources

While interacting with research assistants and mentees, it is important to model appropriate and ethical research practices. Having frank and straightforward discussions about falsifying data, plagiarism, misuse of research, and mistreatment of participants or animals can be eye opening for students. While undergraduates may have heard about some of these issues in a classroom, they must internalize and practice the concepts when they implement them as researchers themselves.

Since the America COMPETES act of 2007, the National Institutes for Health (NIH, 2009) and the National Science Foundation (NSF, 2015) have codified ethics under the general label of Responsible Conduct of Research (RCR) within federal research regulations. These organizations have allowed each institution (and by extension, the faculty) to decide the degree of formal training needed in each field for their trainees. Regardless of whether institutions receive external grant funding, there should be policies in place to consistently apply the requirements of RCR to both internally and externally support research.



NSF has provided funding for two resources in this area: Ethics in Science and Engineering National Clearinghouse (Science, Technology & Society Initiative, 2010) at the University of Massachusetts at Amherst, and, in 2015, the Online Ethics Center (see www.onlineethics.org). For biomedical researcher, NIH funded what is now a paid service that started at the University of Miami called the Collaborative Institutional

Training Initiative (CITI, 2016) program. An alternative, housed within the NIH Office of Extramural Research, is the free Protecting Human Research Participants (2016) training. While the free NIH training only applies to researchers who will be working with Human Subjects/IRB, the CITI program offers training in all the areas of ethical training

As of 2015, NSF and NIH have identified the need for trainings that include case studies and group discussion about ethics. To address these needs, there are two excellent resources in the 1995 publication “Moral Reasoning in Scientific Research: Cases for Teaching and Assessment” by Muriel Bebeau, Kenneth D. Pimple, Karen M. T. Muskavitch, Sandra L. Borden, and David H. Smith. First is the website “Ethics Core” from the National Center for Professional & Research Ethics (2013) at nationalethicscenter.org. Second, along with the more global “Ethics Core” resources, the website includes Two-Minute Challenges geared specifically toward undergraduates, making it easy for trainers or mentors to conduct effective discuss ethical case studies.



Topics in Ethics

Animal Welfare

Appropriate training in this topic will include the federal regulations that govern the use of animals in research, along with the manuals that were developed as resources for scientists on the use and care of animals. Upon completion of training, researchers should recognize that the Institutional Animal Care and Use Committee is in place not as a barrier to animal research but a resource. The committee asks questions and reviews the applications to protect not only the animals, but also the researchers and their institutions. It is well understood that animal studies can elucidate medical issues and solutions that will benefit their human counterparts; however, conducting those studies ethically should always be the highest priority.

Collaboration

Some of the greatest scientific discoveries have been borne out of collaboration. In today’s demanding culture, there is more pressure than ever on researchers to “produce,” whether papers or patents. Like other topics, it is never too early to discuss the division of credit, ownership and responsibility. This protects not only the outcomes but also the relationships between the researchers. Much like a pre-nuptial agreement, a written contract between all parties is a practical (though admittedly unromantic) consideration.

Conflicts of Interest and Commitment

This topic covers the areas of finance and time as they relate to any researcher on a project. Finance equals interest; many researchers or their close family members have financial investments in external projects or companies that relate to their research at

their institutions. There is generally nothing wrong with this overlap, as long as the researcher discloses this information to the appropriate individual responsible for monitoring this issue. A well-known example involves psychiatric researchers at a prestigious medical school studying the effects of ADHD drugs. The study outcomes showed that these drugs were beneficial for children with this diagnosis. However, it was later revealed that the pharmaceutical company paid researchers generous honorariums for other services that were beyond the scope of the research. While the outcomes may have been completely valid and helpful for the individuals taking the drugs, the perception was that the researchers were biased because of the money. This situation could have been avoided if they had disclosed the conflict of interest to their institutions so that it could be managed.

The conflict that is hard for researchers to grasp is a conflict of time (or commitment). Most researchers work significantly more hours than the typical worker and scoff at the idea of a 40 hours work week. They often say “I work as much as I need to in order to get everything done,” which includes teaching, scholarship, research, service, etc. However, when receiving funding for research (especially federal funding, or “tax-payer money”), the funder wants to make sure that they are “getting what they are paying for.” To an academic researcher with only one project, this type of concern may seem trivial. However, when funders observe a researcher engaging in two or more concurrent studies, along with teaching and service, the perception may be that the researcher is overcommitted. In these situations, best practice dictates that researchers engage the appropriate official within their own institution to discuss the issue. Elements that can help justify the time commitment might be the support of others, like undergraduate researchers, who are also sharing the burden of the study work; or time of the year, i.e. summer, when there is little or no teaching.

Data

How data is collected, used, managed, stored, and owned are important issues to address and can often lead to confusion. Human and animal subject training will cover the appropriate methods of collection (to do no harm) and how to use, manage, and store data once it is collected. Ultimately, the ongoing protection of the research subject is the highest priority. Ownership is an additional concern, one that may be dictated by institutional policy, lab rules, or individual negotiations between researchers. It is vital that the ownership rules be established early in the study to protect all the researchers involved, especially students. Since students are so thoroughly invested in the work, they may assume that they can use the data at future educational levels, not understanding that the data is owned by the mentor’s lab.



Human Subjects

This is the oldest of the federally regulated ethical concerns. Originating from the Nuremberg Trials and the revelations of the Nazi medical atrocities, many governments were moved through public outcry to establish protections for people involved in research studies. Over the decades, these protections have expanded to include specific subpopulations such as pregnant women, children, and people with disabilities. On a local level, the review of studies is conducted by an Institutional Review Board (IRB). This interdisciplinary committee must review all research involving human subjects' research and approve it before it can begin. While governed by the federal regulations, the requirements for application and review can vary from institution to institution, and certain research (i.e. best practices in a classroom setting, certain class projects) may be exempt; however, these types of exceptions can only be determined by a member of the IRB, usually the chair.



Researchers should keep in mind that the review process can take between two and four weeks or more depending on the complexity of the study or the population being studied. There are also times when revisions are required before final approval can be given by the IRB, which can increase the wait time for mentees' data collection. In light of these considerations, it is recommended that the mentor review the study and application before submission to the IRB. By taking a proactive approach and overseeing IRB submissions, mentors can ensure that a mentee's research proposal meets all of the requirements from the IRB.

Mentor/Mentee Responsibilities

As with any other skill, mentorship must be developed and strengthened over a period of time. Fortunately, there are a number of resources available to help. As with most work environments, some of the trickiest issues arise from interpersonal dynamics. Some people clash from the beginning, while others mesh too well, leading to romantic entanglements. In addition to using one's moral compass, there are workplace rules that govern these situations and professionals from the Human Resource Office to assist. In the end, it is the onus of each person to act professionally and express questions, concerns, and ideas to their mentor/mentee in a timely manner so that they can be dealt with. However, if issues cannot be resolved, it is the right of mentors and mentees to recuse themselves.

Publication Practices and Authorship

As far as authorship, several things must be considered in deciding the proper division of credit between researchers of a project. Most journals or disciplines have policies that state which participants should be listed as the author of a paper. Most journals agree that it should only be a person who made a direct and substantial intellectual contribution to the design of the research, the interpretation of the data, or the drafting of the paper, although specific journals vary in their policies. The list of authors establishes accountability as well as credit. An author who is willing to take credit for a paper must also bear responsibility for its errors or explain why he or she had no professional responsibility for the material in question.



Research Misconduct

Research misconduct can take many forms, including violating human and animal subject regulations, falsifying or fabricating data, and plagiarism. Though a small-minority of researchers (sadly) intentionally engage in misconduct, most researchers find themselves in murky waters out of ignorance or lack of education. There are many gray areas that individuals do not realize are misconduct – self-plagiarism, for example, or the difference between conducting educational research (exempt from IRB review) but then wanting to publish the research (not exempt). It is the mentor's responsibility to make sure mentees receive the needed information so that they understand the nuances of good scientific practice, how to protect themselves, and also appropriate reporting protocol.

Conclusion

Based on the discipline, ethics are dictated by many official groups. Though ethics is indeed a serious topic, there are numerous resources to help mentors provide excellent mentee training. In the end, whether mentors use a subscription site like the Collaborative Institutional Training Initiative (CITI), one of the free sites listed above, or develop your materials in house, there are a variety of options to make sure that mentees get appropriate and timely training.

References

- Bebeau, M.J., Pimple, K.D., Muskavitch, K.M.T., Borden, S.L., & Smith, D.H. (1995). *Moral reasoning in scientific research: Cases for teaching and assessment*, Available at - https://depts.washington.edu/uwbri/PDF%20Files/Moral_Reasoning_in_Scific_Res.pdf
- Collaborative Institutional Training Initiative (2017). *CITI program*, Available at - <https://www.citiprogram.org/>

National Academy of Engineering (2015). *Online ethics center*, Available at - <http://www.onlineethics.org/>

National Center for Professional & Research Ethics, (2013). *Ethics CORE: Collaborative online resource environment*, Available at - <https://nationalethicscenter.org/>

National Institutes of Health (2009). *Update on the requirement for instruction in the responsible conduct of research*, Available at - <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-10-019.html>

National Institutes of Health (2015). *Responsible conduct of research training*, Available at - <https://oir.nih.gov/sourcebook/ethical-conduct/responsible-conduct-research-training>

National Science Foundation (2015). *Responsible conduct of research*, Available at - <https://www.nsf.gov/bfa/dias/policy/rcr.jsp>.

NIH Office of Extramural Research (2016). *Protecting human research participants*, Retrieved from <https://phrp.nihtraining.com/users/login.php>

Science, Technology & Society Initiative (2010). *Ethics in science and engineering national clearinghouse*, Retrieved from <http://www.umass.edu/sts/digitallibrary/>

CHAPTER 5

INCLUSIVE MENTORING



INCLUSIVE MENTORING

While engaging in mentoring practices, it is important for mentors to consider the sort of environment they want to create for potential and current mentees. A couple of key questions are: Is it an environment that encourages inclusivity? How can mentors work to connect meaningfully with mentees who may come from a variety of backgrounds?

- The literature shows significant and particular benefits for women, racial/ethnic minorities, and first-generation college students including increased retention and continuation (Burke, McKeen, & McKenna, 1994; Gonzalez, 2006; Ishiyama, 2007; Whiteley, Dougherty, & Dreher, 1991)
- Ideally, mentoring should be student specific and holistic in nature. Inclusive mentoring recognizes differences as part of the picture.
- Research suggests that socio-emotional support weighs more in importance than expertise support (Campbell & Campbell, 2007; Cruz & Crisp, 2009; Ishiyama, 2007)
- Students with overwhelming amounts of other responsibilities cannot always make research a priority
- Sensitivity must be extended to the changing needs of students throughout the research process

As summarized above, mentorship can be incredibly beneficial for a wide range of students, and can serve as an important tool to reduce performance and power gaps in higher education (Crutcher, 2006). Research also finds that a diverse student body tends to 'raise all boats' – increasing institutional commitment to multiculturalism, leading to greater emphasis on race and gender in faculty research, and improving student performance, retention, feelings of self-confidence, and social responsibility (Villalpando, 1996). The reality of current higher education can pose distinct challenges due to a lack of diversity among faculty, however; many minority college students seek mentorship outside of the college setting as a result (Jackson, Kite, & Branscombe, 1996), and cross-cultural mentorships can be negatively impacted by a lack of cultural sensitivity when it comes to providing feedback (Cohen, Steele, & Ross, 1999).



In the study by Cohen et al (1999), researchers found that when white mentors provided un-buffered criticism, or criticism paired with a description of standards and expectations, black students responded with lower motivation, increased perceptions of bias, increased stereotype threat, and decreased identification with the domain that was criticized when compared to white students. However, when criticism was paired with assurances that the student was capable of meeting those standards, these differences were eliminated. This basic finding can be expanded to other inclusive mentoring relationships, and suggests that a mentee's perception of feedback can sometimes be very different than what a mentor might intend. It also implies that, especially at the start of a cross-cultural mentorship experience, communication and mutual trust can be

especially important to prevent such misunderstanding – and that clear statements of expectations and encouragement can make a world of difference.

Crutcher (2006) recommended three crucial elements to developing a strong cross-cultural mentorship relationship: that mentors be trained in identity development and cultural competencies, and realize that communication, values, and behaviors are cultural constructions rather than universal; that mentors possess good intrapersonal skills – value, virtue, and vision – and express pride and knowledge of their own identity and cultural values; and, lastly, that mentors have a good knowledge of the phases of mentorship, and how important it is to be deliberate and communicative when initiating and terminating a mentorship relationship with someone who comes from a different cultural background.

Table 1: Good Characteristics of Mentors

<p>Male Perspective:</p> <ol style="list-style-type: none"> 1. Expert in Field 2. Accessible 3. Helpful with Project 4. Communicative about Goals and Plans 5. Friendly 6. Personal Concern 	<p>First Generation Students:</p> <ol style="list-style-type: none"> 1. Expert in the Field 2. Accessible 3. Communicative about Goals and Plans 4. Helpful with Project 5. Personal Concern 6. Friendly
<p>Female Perspective:</p> <ol style="list-style-type: none"> 1. Accessible 2. Helpful with Project 3. Expert in Field 4. Friendly 5. Communicative about Goals and Plans 6. Personal Concern 	<p>Continuing Generation Students:</p> <ol style="list-style-type: none"> 1. Expert in Field 2. Accessible 3. Helpful with Project 4. Communicative about Goals and Plans 5. Friendly 6. Personal Concern

Source: (Ishiyama, 2007)

Resisting the Mentorship Process

Faculty often complain that students are unwilling to take their advice, are passive-aggressive, or otherwise exhibit “resistance to mentoring”. This is often interpreted as meaning that the student “does not care,” and is the source of disappointment and resentment on part of the faculty member.

Resistance to being mentored might result from many sources and situations, sometimes including genuine lack of interest on the part of the student. Stereotype

threat is also a well- documented predicament that might make a student skeptical or distrustful of the research mentor. However, other psychosocial issues may induce resistance to being mentored. Mentors should take care to provide an open environment that is welcoming to all students, working on eliminating “micro-aggressions” from the research or creative environment.

It is also important to consider the other side of the coin, which is “resistance to mentoring others”, in which the might-be mentor actually resists mentoring the protégé, or sees mentoring in a very narrow way that inhibits or precludes effective mentoring.

Building Interpersonal Respect and Trust

- Be sensitive to the changing needs of students through the research process
- Communicate that the student’s work is a priority for you
- Create an open environment for questions and informal conversation
- Cultivate approachability and patience
- Offer positive responses: “I like how you approached that problem. Can you discuss your thinking on this one?”
- Provide a physical space for student work and/or set aside office hours specifically for UR consultations
- Provide precise/direct and timely feedback

(Gonzalez, 2006; Watkins, 2005)

Embodying Cultural Responsiveness

- Accept that your way may be right for you, but might not be right for your mentee based on sets of internalized values, ethics and customs.
- Be honest when you examine your own prejudices and stereotypes.
- Differences in culture are opportunities to understand more about the world we all live in and how it has been shaped. This truly is a learning experience that both can learn from.
- It is important to understand the common threads that bind you, for instance a shared vision of reducing poverty can be enough to help start a process of overcoming cultural barriers.
- Remember that our culture is like a well-worn suit; it hangs just right and feels so comfortable that we are often barely unaware of wearing it. When we are wearing a new suit and it feels uncomfortable we may feel uneasy and ‘obvious’. It’s okay to feel like this as long as you understand that your discomfort is because of the ill-ease, which may simply be prejudices coming to the fore for examination.
- Try to identify how common biases can come into being and the history that surrounds these – remember in history there is often no such thing as ‘fact’ simply perspective and it is often written from the perspective of the ‘winner.’
- Consider re-framing: rather than being a challenge that must be overcome, diverse voices and perspectives can be a source of strength in your lab. A variety of points of view can provide new avenues for research.

- Remember – there can be differences in communication and expression that can lead to mistaken impressions – just because a mentee does not express enthusiasm or gratitude as you would does not mean that they are unfeeling!
- Try to avoid making assumptions about your mentee. Why not ask them what they are thinking and feeling? Communication is key.

Undergraduate-Specific Considerations

Mentorship, especially of undergraduates, is crucial for their success. By the time students make it to graduate school they have a very clear life roadmap; many undergraduate students enter their faculty mentor's offices as blank slates. Mentoring undergraduates can be a daunting task, riddled with significant challenges. There are developmental considerations, potential generational conflicts, and resource allocation issues, which threaten to interfere with the success of the mentor-mentee relationship.

Most traditional undergraduates are between the ages of 18-24 years old. Research on the theory of identity development (Chickering & Reisser, 1993) suggests that persons in this age range experience seven factors, later called vectors, of development during college. These are:

- Developing Competence
- Developing Integrity
- Developing Mature Interpersonal relationships
- Developing Purpose
- Establishing Identity
- Managing Emotions
- Moving through Autonomy toward Interdependence

These vectors need not be handled in a specific order nor individually – a student can work on more than one vector at once and frequently will revisit vectors as her experiences lead her to do so to achieve what Chickering and Reisser (1993) call “identity.” However, students must find a way to work through these vectors in some order at least once. Chickering and Reisser (1993) postulated that seven external forces contribute to a student's ultimate identity development – i.e., “who” they are. The seven external factors are: institutional size, institutional objectives, curriculum, teaching, student development programs, friendship and student communities, and (last but not least) student-faculty relationship. Thus, when considering individual research environments, it becomes clear that undergraduate mentors can have a profound impact on a student's ability to develop the factors associated with identity.

Further, for a mentor-mentee relationship to be successful, several obstacles must be overcome. One barrier is the developmental difference between mentor and mentee. A traditional undergraduate aged 18-24, for example, may be developmentally quite different from a tenured faculty member. Therefore, mentors may experience common frustrations with undergraduate mentees, such as:

- Mentees are immature
- Mentees exhibit lack of focus
- Mentees focus on the wrong things
- Mentees lack basic knowledge of the field
- Mentees miss appointments

Similarly, undergraduates may find working with faculty mentors a difficult undertaking. They may report that the faculty mentor is:

- A bad fit for the mentee
- Impatient with questions they deem trivial
- Too busy to mentor properly
- Too formal
- Too narrow-minded to see things in new ways
- Uncaring about the student's personal life

There are portions of mentoring, especially psychosocial mentoring, which may not be as successful due to a mentor and mentee having developmental and generational divides. Here's a list adapted from Baizerman (1994) that illustrates some of the perceived challenges and assumptions that can be present when there are generational and power differences at work between teachers and mentors (who are most often adults 30+ years of age) and students in an undergraduate environment (who are most often adults 18-25 years of age).

1. Mentors know what's best for mentees; mentees know what's best for themselves.

Mentors must "put on the brakes" sometimes and realize that under- graduates are old enough to make decisions for themselves. There may be times where mentors want to parent, or to coerce them into decisions that mentors believe are the best for them. Ultimately, mentees have to be the masters of their own destinies.

2. Mentors have experience and mentees want experience (do not want to be treated like they're idiots).

Part of being a good mentor is showing a student how to do something and then knowing when to get out of the way!

3. Mentors want to take some time and think it over, and mentees want to do it yesterday.

This has to do with the differences in experience. Undergraduates want to spend very little time on the preparation stages of any project; they simply want to begin! Mentors with experience in the field realize that preparation is key to the success of any type of research or project and without good preparation one is doomed to fail.

4. Mentors want to talk (use words) and mentees want to act (do it).

Mentees operate with a language of action and mentors operation with a language of words. Without an interpreter or very patient mentor and mentee this can become an automatic problem. Of course, this is clearly a generational issue as well. We are all aware that as the generation gap grows between mentor and mentee there is a greater possibility for a communication complication. Each generation has its own communicative style and these are not always compatible. For example, methods of communication that were commonplace and comfortable for Generation Xers (telephone, face-to-face) are not the norm for Generations Y or Z.

5. Mentors think about consequences and mentees think about now (or tomorrow or next week).

We know because of our extensive research on the mechanics of the adolescent brain that there are significant differences between the adolescent and the adult brain – and furthermore, that the brain continues to grow and develop through the early 20s. Most traditional college students are developmentally classified as “late-stage adolescents” rather than young adults (Erickson, 1968). The National Research Council's 1999 Forum on Adolescence states that "one (of) the most remarkable findings in neurobiology of the last decade is the extent of change that can occur in the (adolescent) brain..." This indicates (for the first time) that the adult brain and teenage brain are physiologically different.

Giedd, Blumenthal, Jeffries, Castellanos, Liu, Zijgenbos, & Rapoport, 1999 found the most significant changes in the adolescent brain to be in the frontal lobes or prefrontal cortex. It is these areas, among other things, which control impulses, calm emotions, provide an understanding of the consequences of behavior and allow reasoned, logical and rational decision making processes. These “executive functions” do not fully develop until the early twenties.

6. Mentors think they have to be in charge, and mentees want a chance to be in charge.

Undergraduates are experimenting with their place in the world. Since most do not yet have any idea what they want to do, it is to their distinct advantage to “professionally experiment.” Perhaps the best way for students to figure out their permanent destination is if they are allowed to navigate the ship. Students who

research with their mentor, especially if it is student-driven research, will quickly be able to decide for themselves if they have chosen the correct field of study.

7. Mentors can 'hang in there' longer than mentees, who get bored easily and quickly and want a change of task or job.

Undergraduates, especially those new to the research in their perspective fields, must learn the pacing of academics.

Sometimes projects that seem simple in their design take months and/or years to reach completion because of resourcing and staffing issues, IRB complications, funding inconsistencies and the like.

8. Mentors think that it will be too expensive and that mentees do not understand this, while mentees believe that mentors can get the money if they want to.

Just as undergraduates may not understand the pacing of research in their fields, they might not understand the hidden costs associated with research projects as well. Determining the actual cost of a research experiment is a science in and of itself. Workload is an issue that is currently not fully considered when determining costs. Is the faculty member that is researching going to be released from all activities (teaching, mentoring other students, advising, service to the university, etc.) and who is going to pay to have those activities covered?

9. Mentors really do not respect mentees, but expect mentees to respect them.

Respect is truly a two-way street. Many times faculty mentors assume that mentees should respect them automatically yet make mentees earn their respect. What lesson does this teach students? Does this teach mentees that respect is only to be given away based on age? Rank? Or, that they have innate worth?

10. Mentors think that they know how to work on a project with mentees and mentees think they do not know how to work on a project with mentors.

This is simply an issue of the mentor/mentee coming at the issue with differing perspectives or points of view. If we as a university community can train our mentors and mentees to strip themselves of expectations coming into the mentor/mentee relationship this problem will resolve itself. It does help to have past mentees of a faculty mentor discuss the process with a future mentee. This former mentee might even serve as a second resource or mentor for the current mentee, thereby creating a recent mentorship network.

References

- Baizerman, M. (1994). Adolescents and adults: Why working together seems impossible. *The Child Care Worker*, 12(8): 6-8.

- Burke, R. J., McKeen, C. A., & McKenna, C. (1994). Benefits of mentoring in organizations. *Journal of Managerial Psychology*, 9: 22-32.
- Campbell, T., & Campbell, D. (2007). Outcomes of mentoring at-risk college students: gender and ethnic matching effects. *Mentoring & Tutoring*, 15: 135-148.
- Chickering A. W. & Reisser, L. (1993). *Education and identity* (2nd ed.). San Francisco: Jossey-Bass Publishers.
- Cohen, G.L., Steele, C.M., & Ross, L.D. (1999). The mentor's dilemma: Providing critical feedback across the racial divide. *Personality & Social Psychology Bulletin*, 25: 1302-1318.
- Crutcher, B. (2006). *Cross-cultural mentoring: An examination of the perspectives of mentors*. (Electronic Thesis or Dissertation). Miami University, Ohio.
- Cruz, G. & Crisp, I. (2009). Mentoring college students: A critical review of the literature between 1990 and 2007, *Research in Higher Education*, 50: 525-545.
- Erikson, E. H. (1968). *Identity, Youth and Crisis*, New York: Norton.
- Forum on Adolescence (1999). Adolescent development and the biology of puberty. *The National Research Council*, Available at - <http://www.rcgd.isr.umich.edu/garp/articles/eccles99r.pdf>
- Giedd, J. N., Blumenthal, J., Jeffries, N. O., Castellanos, F. X., Liu, H., Zijgenbos, A., & Rapoport, J. L. (1999). Brain development during childhood and adolescence: a longitudinal MRI study, *Nature Neuroscience*, 2(10): 861-863.
- González, C. (2006). When is a mentor like a monk? *Academe*, 92(3): 29-32.
- Ishiyama, J. (2007). Expectations and perceptions of undergraduate research mentoring: Comparing first generation, low income white/Caucasian and African American students. *College Student Journal*, 41: 540-549.
- Jackson, C.H., Kite, M.E., & Branscombe, N.R. (1996). African-American women's mentoring experiences. Paper presented at annual meeting of the *American Psychological Association*, Toronto, Canada.
- Villalpando, O. (1996). *The long term effects of college on chicana and chicano students' 'other oriented' values, service careers and community involvement*. (Unpublished doctoral dissertation). University of California—Los Angeles.
- Watkins, P. (2005). The principal's role in attracting, retaining, and developing new teachers. *The Clearing House*, 79(2): 83-87.
- Whiteley, W., Dougherty, T.W., & Dreher, G.F. (1991). Relationship of career mentoring and socio-economic origin to managers' and professionals' career progress. *Academy of Management Journal*, 34: 331-351.

CHAPTER 6
MENTORING AND WORKLOAD
PART I: MENTORING
AND
ORGANIZING RESEARCH
ACTIVITY



MENTORING AND WORKLOAD - PART I: MENTORING AND ORGANIZING RESEARCH ACTIVITY

Perhaps, the greatest challenge for faculty who are advocates of undergraduate research engagement is the integration of mentorship activities into the busy, already packed schedule of faculty commitments. The solution to this challenge lies in faculty members' abilities to adequately plan for how the integration of undergraduate research works best for them. This chapter introduces and discusses the Personal Undergraduate Research Plan (PURP) developed by Dr. Jeanetta D. Sims, as a faculty approach to undergraduate research engagement and as the central organizing principle for integrating and aligning undergraduate research activity. Through examining PURP, mentors can prepare and structure research engagement in advance while using tools and templates designed to make research integration more efficient.

Why Identifying a Personal Undergraduate Research Plan (PURP) Matters

Faculty members who choose to go on the undergraduate research mentorship journey are making an academic career decision that will require work beyond the typical duties associated with faculty life. This decision should not be made in isolation, because it impacts multiple areas simultaneously. Typically, faculty members weigh undergraduate research engagement amidst the backdrop of departmental, college, and university expectations for teaching, scholarship, and service requirements that are usually associated with tenure and promotion. This means mentors should personally weigh how an undergraduate research program fits within faculty life, fits within academic aspirations, and fits within a particular institutional mission. Institutions can assist or influence a PURP; however, only the mentor herself can sustain a commitment to mentorship over the long haul.

Mentors will need to ask and answer several broader questions concerning their faculty role to identify an individual PURP. Questions to consider include:

1. Out of 100% of your time as a faculty member, what do you anticipate to be the percentage breakdown of how your institution views your commitment to research, teaching, service, and administrative (if applicable) or other work?
2. Out of 100% of your time as a faculty member, what do you anticipate to be the percentage breakdown of how you view your commitment to research, teaching, service, and administrative (if applicable) or other work?
3. Where does your department, college, and/or institution place undergraduate research mentorship engagement (e.g., some consider this as research, others consider it as teaching, many might consider it as service, and still others may consider it a combination of two or more aspects)?
4. How do you see undergraduate research mentorship engagement fitting in to your tenure and/or promotion processes? In other words, where would you place this activity in your dossier if you were submitting it for tenure and promotion today?

5. Given your responses to the previous questions, out of 100% of your time as a faculty member, what is the realistic percentage breakdown that you will devote to research, teaching, service, and administrative (if applicable) or other work? And, what percentage of that time will be associated with mentoring undergraduate research?

Mentors will likely not answer these questions the same way as a host of faculty who engage in mentoring undergraduate research, which is fine. The primary aim is for mentors to use their responses to shape undergraduate research integration and to organize available time that will be devoted to undergraduate research mentoring. Developing a plan up front provides a benchmark for allocating the hours and knowing the placement of undergraduate research engagement that best suits the individual mentor. See Table 2 for examples of how the percentage breakdown and hours available might differ for faculty in research-intensive versus teaching-intensive positions. Though the type of faculty position and the integration of undergraduate research engagement differ, the total number of hours each week devoted to undergraduate research is the same. How this unfolds in each faculty member's schedule would look very different. Faculty Member A's mentored research engagement would likely occur out of the classroom with a significant amount of time spent working with teams of students on multiple research projects through scheduled meetings and deadlines. Faculty Member B's mentored research engagement would likely occur both in and out of the classroom with fewer out-of-class students and thus fewer scheduled research meetings outside of class. Numerous other scenarios exist, particularly with administrative and other appointments, if undergraduate research activity is placed within those faculty commitments. All arrangements have their own unique set of advantages and challenges. Also, mentors should keep in mind that their desired and ideal hours will likely be altered to fewer or more hours as you complete deadlines or make adjustments to meet upcoming deadlines. The benefit of having a PURP is that since mentors know in advance how they wish to handle their time, they can always be reflective and revise plans to best meet the ebb and flow of research projects and the dynamic nature of their needs as a faculty member. The aim here is for faculty to use the PURP to be intentional, deliberate, and realistic about how they wish to integrate mentored undergraduate research into their existing set of faculty commitments.

Table 2: Sample Development of a Personal Undergraduate Research Plan (PURP) for Two Faculty Members in Varying Faculty Positions

Faculty Commitments	Research-Intensive Faculty Position <i>Faculty Member A</i>			Teaching-Intensive Faculty Position <i>Faculty Member B</i>		
	<i>Weekly Allocated %</i>	<i>Weekly Hours Available</i>	<i>Undergraduate Research Weekly Hours*</i>	<i>Weekly Allocated %</i>	<i>Weekly Hours Available</i>	<i>Undergraduate Research Weekly Hours*</i>
<i>Teaching</i>	30%	12	0	60%	24	6
<i>Research</i>	60%	24	12	30%	12	6
<i>Service</i>	10%	4	0	10%	4	0
Total	100%	40	12	100%	40	12

* The number of hours to devote to mentoring undergraduate research and the associated placement of those hours within existing faculty commitments are all personal faculty decisions made through using Dr. Sims' PURP.

What Should be Organized Post-PURP?

Through using the PURP, mentors should now have developed a general direction for how many weekly hours they will devote to undergraduate research as well as where these hours will be placed in their personal schedules. What follows next are a series of tips, tools and templates that can make the work of integration a bit more organized and easier. All of the templates provided were created by Dr. Jeanetta Sims and are used in her Diverse Student Scholars program, which is an interdisciplinary, predominantly undergraduate research program that she founded (see Sims, Shuff, Lai, Lim, Neese, Neese, & Sims, in press, for more information on Diverse Students Scholars, which is housed in the College of Business at the University of Central Oklahoma). The impact of the Diverse Student Scholars program from a qualitative perspective has been shared in several presentations and publications (Sims, Anderson, & Murray, 2012; Sims, Anderson, Neese, & Sims, 2013; Sims, Le, Emery, & Smith, 2012; Sims, Le, Smith, 2011).

Know Your Goals: It is a very different arrangement to mentor a group of in-class students to complete an on-campus showcase poster presentation than it is to mentor research assistantships through completion of a multi-phase research project with a finished manuscript for national conference presentation submission. Both sets of activities can result in a co-authored presentation and occur in a single semester; however, the latter will likely result in a more intense semester. Organization begins with knowing what needs to be achieved in the available time you have committed for the semester, the summer, or the academic year. Make a decision about the set of goals you wish to accomplish for each category of mentored undergraduate research activity, and keep these overall goals in mind as you progress through the semester, summer, or academic year.

Identify Available Research Opportunity Outlets and Associated Deadlines: Related to, but different than knowing your goals, is your ability to understand which opportunities will mesh with the timing of your undergraduate research engagement projects. Which undergraduate research venues, conferences, or submission deadlines are forthcoming that you could realistically meet? What disciplinary conferences are

potential fits for projects that you and your students might be pursuing? And, what are the deadlines associated with those conferences? Typically, conference due dates are fairly routine in that they occur early October, mid-December, late March, and so on. If you will identify the dates associated with these research outlets, you can begin each semester with potential target deadlines on the radar for you and your team.

Craft a Timeline for Each Project: If your goal is to have a national conference submission at the end of the academic year, you will need to have a timeline with monthly deadlines that represent the assigned tasks to be completed during each interval of the research pipeline process for that project. If additional research project timelines are completed using the same template for other projects, you can easily view an at-a-glance status of undergraduate research activities. See Figure 4 for sample timelines associated with two Diverse Student Scholars student projects for the 2015-2016 academic years.

Figure 4: Diverse Student Scholars Sample Research Timelines

Month	Atoya - Research Activities	Jalea- Research Activities
Aug 15	Research relevant articles about African American female perceptions about technology, as well as relational dialectics and racio-ethnic and gender research related to the digital divide.	Modify IRB application to get approval to include Latinas for participant recruitment.
Sep 15	Research additional articles; Finalize literature review and begin working on IRB application.	After IRB approval, begin preliminary contacts for participant recruitment and scheduling interviews. Prepare consent materials and interview documents.
Oct 15	Finalize interview protocol and finalize the IRB and submit for approval. Begin writing prospectus. After IRB approval, begin participant recruitment and schedule personal interviews.	Conduct 5 interviews with digital uploading of interview recordings.
Nov 15	Conduct 4 personal interviews.	Transcribe interviews and begin recruitment to schedule the next 5 with digital uploading of interview recordings.
Dec 15	Conduct 6 personal interviews.	Transcribe interviews and begin recruitment to schedule the next 5 interviews with digital uploading of interview recordings.
Jan 16	Conduct 5 personal interviews. Work with Faculty Mentor to identify student to assist with transcribing interviews. Submit abstract for 2016 Oklahoma Research Day.	Transcribe interviews and begin recruitment to schedule the next 5 with digital uploading of interview recordings. Submit poster abstract for 2016 Oklahoma Research Day.
Feb 16	Conduct 5 personal interviews. Begin transcribing interviews.	Complete Oklahoma Research Day poster. Apply for new RCSA grant that can fund the continuation of this program of research. Consult with Faculty Mentor to select a team and begin data analysis/coding.
Mar 16	Continue transcribing personal interviews. Begin to analyze interview transcripts for common themes and dialectical tensions. Present project poster at the 2016 Oklahoma Research Day.	Submit preliminary research for presentation at the 2016 National Communication Association conference; Present project poster at the 2016 Oklahoma Research Day.
Apr 16	Finalize transcribing interviews. Finalize analyzing interview transcripts for common themes and dialectical tensions and write results. Submit final manuscript to a journal for publication.	Continue with data analysis and analyzing interview transcripts for common themes and dialectical tensions. Work will likely continue with my Faculty Mentor into the fall.



Secure Copies of Schedules: If the bulk of your PURP will be integrated outside of the classroom, you will need to coordinate the availability of the students you select to work with you into your available schedule. See Figure 5 for a sample schedule that all students in the Diverse Student Scholars program complete at the beginning of each semester. Having students complete their schedule for the semester when they express interest in working with you can help you select students whose availability matches

your schedule as well as the schedule(s) of other students who will be working on the same project(s). The individual student schedules can be combined to create an “All Research Assistant Schedule” (RA) if desired that can assist you in scheduling data collection for research projects as well. See Figure 6 for a sample “All RA Schedule” that was used for a multi-phase research project.

Figure 5: Diverse Student Scholars Sample RA Schedules

Fall 2015 Schedule					
Ashley Neese - 7 hours (5-RCSA & 3 TL Scholar)					
	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 AM					
8:30 AM					
9:00 AM		Yellow		Yellow	
9:30 AM		Yellow		Yellow	
10:00 AM		Yellow		Yellow	
10:30 AM		Yellow		Yellow	
11:00 AM		Yellow		Yellow	
11:30 AM					
12:00 PM					
12:30 PM	Yellow		Yellow	Yellow	Yellow
1:00 PM	Yellow		Yellow	Yellow	Yellow
1:30 PM	Yellow		Yellow	Yellow	Yellow
2:00 PM	Yellow		Yellow	Yellow	Yellow
2:30 PM					
3:00 PM					

Fall 2014 Schedule					
LeeAnn Floyd					
	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 AM	Yellow	Yellow	Yellow	Yellow	Yellow
8:30 AM	Yellow	Yellow	Yellow	Yellow	Yellow
9:00 AM	Yellow	Yellow	Yellow	Yellow	Yellow
9:30 AM	Grey	Yellow	Grey	Yellow	Yellow
10:00 AM	Grey	Yellow	Grey	Yellow	Yellow
10:30 AM	Grey	Yellow	Grey	Yellow	Yellow
11:00 AM	Grey	Yellow	Grey	Yellow	Yellow
11:30 AM	Yellow	Yellow	Yellow	Yellow	Yellow
12:00 PM	Grey	Yellow	Grey	Yellow	Yellow
12:30 PM	Grey	Yellow	Grey	Yellow	Yellow
1:00 PM	Grey	Yellow	Grey	Yellow	Yellow
1:30 PM	Grey	Yellow	Grey	Yellow	Yellow
2:00 PM	Grey	Yellow	Grey	Grey	Yellow
2:30 PM	Grey	Yellow	Grey	Grey	Yellow
3:00 PM	Grey	Yellow	Grey	Grey	Yellow
3:30 PM	Grey	Yellow	Grey	Grey	Yellow
4:00 PM	Grey	Yellow	Grey	Grey	Yellow
4:30 PM	Grey	Yellow	Grey	Yellow	Yellow
5:00 PM	Grey	Yellow	Grey	Yellow	E24
6:00 PM	Grey	Yellow	Grey	Yellow	Yellow
7:00 PM	Grey	Yellow	Grey	Yellow	Yellow
8:00 PM	Yellow	Yellow	Yellow	Yellow	Yellow
9:00 PM	Yellow	Yellow	Yellow	Yellow	Yellow
10:00 PM	Yellow	Yellow	Yellow	Yellow	Yellow



Figure 6: Diverse Student Scholars Sample All RA Schedule

Fall 2014 Schedule					
All RA Schedule					
	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 AM	Ashley, LeeAnn, Angelia, Sarah	Sarah, Ashley, Jalea, LeeAnn, Oon Feng, Jimmy	Sarah, Ashley, Jalea, LeeAnn, Angelia, Jimmy, Oon Feng	Sarah, Ashley, Jalea, LeeAnn, Oon Feng, Jimmy	Sarah, Ashley, Jalea, LeeAnn, Oon Feng
8:30 AM	Ashley, LeeAnn, Angelia, Sarah	Sarah, Ashley, Jalea, LeeAnn, Oon Feng, Jimmy	Sarah, Ashley, Jalea, LeeAnn, Angelia, Jimmy, Oon Feng	Sarah, Ashley, Jalea, LeeAnn, Oon Feng, Jimmy	Sarah, Ashley, Jalea, LeeAnn, Oon Feng
9:00 AM	LeeAnn, Angelia, Sarah	Sarah, Ashley, Jalea, LeeAnn, Oon Feng	Sarah, Jalea, LeeAnn, Angelia, Jimmy, Oon Feng	Sarah, Ashley, Jalea, LeeAnn, Oon Feng	Jalea, LeeAnn, Oon Feng, Sarah
9:30 AM	Angelia, Oon Feng, Sarah	Sarah, Ashley, Jalea, LeeAnn	Sarah, Jalea, Angelia, Jimmy, Oon Feng	Sarah, Ashley, Jalea, LeeAnn	Jalea, LeeAnn, Oon Feng, Sarah
10:00 AM	Angelia, Oon Feng, Sarah	Sarah, Ashley, Jalea, LeeAnn	Sarah, Jalea, Angelia, Jimmy, Oon Feng	Sarah, Ashley, Jalea, LeeAnn	Jalea, LeeAnn, Oon Feng, Sarah
10:30 AM	Angelia, Oon Feng, Sarah	Sarah, Ashley, Jalea, LeeAnn	Sarah, Jalea, Angelia, Jimmy, Oon Feng	Sarah, Ashley, Jalea, LeeAnn	Jalea, LeeAnn, Oon Feng, Sarah
11:00 AM	Angelia, Oon Feng, Sarah, LeeAnn	Atoya, Sarah, Jalea, LeeAnn, Ashley	Atoya, Sarah, Jalea, Angelia, Jimmy, Oon Feng, LeeAnn	Atoya, Sarah, Jalea, LeeAnn, Ashley	Jalea, LeeAnn, Oon Feng, Sarah



Schedule Weekly Meeting Times: Scheduled time is the “secret” for advancing research in the Diverse Student Scholars program. All individuals associated with a research project will meet at least once weekly to report on completed work and learn assignments for the following week’s work. If a student works on multiple research projects, that particular student will attend at least two weekly scheduled meetings. These meetings can take place in person or via conference call (for veteran RAs). The success of mentored projects in terms of successful completion rates are directly associated with the frequency and quality of scheduled weekly meetings. If research engagement is completed within the classroom environment, scheduled time should exist within the course calendar for mentored team meetings.

Create Uniform Templates: A final suggestion for organizing mentored undergraduate research activity is to provide students with the same templates for completing research work. This enables students to never, “start from scratch” as they work to complete research narratives, posters, and proposals; they can tweak aspects of the template while simultaneously seeing how they are making progress in their work. Plus, over time templates provide you with a host of sample approaches once your students have used your templates through the years. Templates can be created for developing research abstracts, writing literature reviews, developing project narratives, creating poster

presentations, etc. The more students you mentor, the greater benefits you reap from the use of uniform templates.

Conclusion

The Diverse Student Scholars program was developed as a faculty member's personal contribution to the Academy. Mentors can be wise and proactively plan up front in establishing how best to fit undergraduate research mentoring activities into their faculty life. Mentors should use the PURP to know their own desired level of commitment based on the type of position and the institution where they reside.

References

- Sims, J. D., Anderson, P., & Murray, A. (2012). First-generation student research engagement: What are they learning and why does it matter. *Marketing Management Association Fall Conference Proceedings*, 234-235.
- Sims, J. D., Anderson, P., Neese, S., & Sims, A. (2013). Enhancing student cognitive, affective, and behavioral development through undergraduate research. *Marketing Management Association Fall Conference Proceedings*, 134-135.
- Sims, J. D., Shuff, J., Lai, H-L., Lim, O. F., Neese, A., Neese, A., & Sims, A. (in press). Diverse Student Scholars: How a faculty member's undergraduate research program can advance workforce diversity learning. In C. L. Scott & J. D. Sims (Eds.), *Developing workforce diversity programs, curriculum, and degrees*. Hershey, PA: IGI Global.
- Sims, J. D., Le, J., Emery, B., & Smith, J. (2012). Beyond the quantitative headcount: Considering the un-captured qualitative impact of engaging undergraduate students in research. *Council on Undergraduate Research Quarterly*, 32(3): 23-27.
- Sims, J. D., Le, J., & Smith, J. (2011). Advancing the research pipeline: Enlisting undergraduate students in faculty co-authored research. *Marketing Management Association Fall Conference Proceedings*, 238-239.

CHAPTER 6
MENTORING AND WORKLOAD
PART II: MENTORING
AND
MANAGING RESEARCH ACTIVITY



MENTORING AND WORKLOAD - PART II: MENTORING AND MANAGING RESEARCH ACTIVITY

As stated in the previous section, establishing PURP is key to developing a well-defined plan for faculty mentors engaged in undergraduate research (Sims, 2017). It allows mentors to determine how they will distribute workload time when planning for teaching, scholarship, and service. In addition to a tightly-aligned plan, faculty mentors must know how to manage their workload time. This section provides evidence-based strategies that will help manage mentoring workload and minimize burnout (Coker & Davies, 2009; Horowitz & Christopher, 2013; and Pita, Ramirez, Joacin, Prentice, & Clark, 2013). Therefore, while Part I focused on mentoring and organizing a workload plan, Part II of Mentoring and Workload focuses on mentoring and workload management.

Suggestions for Faculty Mentors

Start Mentoring Research Early: Involve students early establishes research programs that are designed for sustainability over time. Some institutions encourage students to engage in undergraduate research during their freshman year, while others wait until their senior year. Researchers argue that if students begin early in their college careers, they will be around long enough to become peer mentors and assist faculty mentors. Faculty mentors must avoid training later at institutions only to watch their students graduate and not engage in extensive research. Creating a system of peer mentors can help reduce the likelihood of a few faculty mentors left to mentor many students at one time (Coker & Davies, 2009).

Help Beginning Researchers See Themselves as Scholars: Opens lines of communication are needed and attention to psychosocial aspects such as increasing confidence through a variety of means is critical to forming mentor-mentee relationship. As stated previously in chapter five, faculty mentors must be culturally responsive and willing to carve out time during the workday to invest in this relationship building process. Activities such as scheduling an on-campus breakfast, lunch, or coffee break meeting may be feasible since this time is typically a part of the work (Horowitz & Christopher, 2013).

Embrace Curriculum Integration: Mentors might consider embedding research within existing courses (Pita, Ramirez, Joacin, Prentice, & Clark, 2013). In many cases, different kinds of mentoring are needed depending on the stages of mentees. Assuming more than one year of engagement in undergraduate research, the first year typically involves transition and adjustment and the period, which students focus on engagement in the community and fitting in as a scholar (Horowitz & Christopher, 2013). All mentees in this stage rely on their mentors to help learn and apply research ethics. Ethics courses will include this training and no additional mentoring outside of class is needed. The same holds true when mentoring students to pass comprehensive exams for their particular disciplines. Horowitz & Christopher, 2013 refer to this as second-stage mentoring since it occurs after learning rules and procedures for the discipline. It involves practical research and coursework mentoring that prepares mentees for the

passing of exams unique to various disciplines. Training student researchers within the paradigm of curriculum integration is time efficient and advantageous for everyone. Mentors can increase research productivity as one of the main course requirements while mentees learn both course content and how to research effectively.

Become Familiar with Resources: Mentors should familiarize themselves with a variety of resources related to the typical needs of students and the community. Establishing a list of resources will save time and establish a systemic pattern over time. Needs pertaining to students might include degree planning, career counseling, and counseling about graduate programs of study. Examples include speakers from the Career Affairs Office where mentees learn interviewing techniques, conference presentations, and resume writing (Coker & Davies, 2009).

Increase Awareness of Community Needs: The community can provide hands-on resources and serve as effective lab experiences. Coker & Davies (2009) argue that mentors can provide hands on supervision alongside when possible in the lab. It is during this time the mentor can give clear instruction, is accessible to listening, and can answer questions. This type of real-world mentoring allows learning to take place and allows the mentor to save time by responding immediately and not having to respond in writing later.

Conclusion

Engagement in early undergraduate research has the potential to contribute to the development of student mentors that can reduce the likelihood of faculty mentors mentoring many students at one time (Coker & Davies, 2009). Forming culturally responsive, mentor-mentee relationships can help mentees experience a change of consciousness in their ability to engage in undergrad research. This change can motivate them to engage in future research. Training student researchers within the integration of, embedded curricula is time efficient and does not require long hours of outside research time. Moreover, real-world lab mentoring is also advantageous. It allows the faculty mentor to mentor alongside the mentee and save time by responding immediately, alleviating the need for written responses at a later time. In order to reduce faculty workload, faculty mentors must consider employing these strategies. The next chapter provides such strategies.

References

- Coker, J. & Davies, E. (2009). Ten time-saving tips for undergraduate research mentors. *Journal of National Resources and Life Sciences Education*, 35: 110-112.
- Horowitz, J. & Christopher, K. B. (2013). Issues related to mentoring undergraduate research and availability. *Innovative Higher Education*, 38: 106-116.
- Pita, M., Ramirez, C., Joacin, N., Prentice, S., & Clark, C. (2013). Five effective strategies for mentoring undergraduates: Students' perspectives. *Council for Undergraduate Research Quarterly*, 33(3): 1-5.

CHAPTER 7

**GROUP
AND
COHORT MENTORING**



GROUP AND COHORT MENTORING

As stated in Chapter Six Part II mentors can increase research productivity while mentoring occurs in in the classroom, or in a group. Programs that see issues with faculty mentors may decide to implement peer mentorships programs. Peer mentorship programs pair similarly minded (and aged) mentors and mentees in hopes they will learn from each other in the collegiate setting.

This paradigm seems to be very helpful for some mentees as they have reported that there are many questions they would not be comfortable asking a faculty mentor. For the purposes of this handbook, peer-to-peer mentoring encompasses students with the same status, i.e., both are underclassmen (freshmen and sophomores) or upperclassmen (juniors or seniors). Peer-to-peer mentoring has shown great success in some areas, especially in those related to social situations like a feeling of belonging and inclusiveness (Weresh, 2010).



Cross-age mentorship is an idea that has been used in the elementary school setting for quite some time (Karcher, 2005). The premise is that students want to emulate people who are slightly older than themselves. Peer-to-peer mentoring is successful; however, if the peer were slightly older, it might be even more successful. With undergraduates in particular, this mentorship pairing can be especially beneficial. Upperclassmen clearly have a fresh, recent perspective on what lowerclassmen have gone through and this enables them to give advice that faculty mentors might not be able to give.

Function. Group Mentorship can operate in much the same way as a traditional mentor/mentee relationship. It is designed for one mentor to serve as a guide for a group of students with the same interests and is particularly useful in smaller schools in programs without the resources to have traditional mentor/mentee relationships. Although some might think that this type of mentorship is not as rewarding for the mentee as the traditional model, sometimes it proves to be more effective because it provides both faculty and peer mentoring simultaneously. Within the group mentorship, novice and expert mentees often engage in peer mentoring. Studies have shown that peer mentorships within groups (specifically cross-age peer mentorship if you can count upperclassmen and underclassmen in that category) can be more effective in certain areas than traditional mentor/mentee relationships.



Benefits. Unfortunately sometimes faculty overextend themselves. No one can really know when entering into a mentor relationship exactly how much time it will require. Mentees are like snowflakes, no two are alike; therefore, no two mentorship relationships are alike. As stated in chapter six, to prevent burnout on the part of

involved faculty, group mentorships can be very helpful. We suggest that the group maintain some secure way to communicate frequently and easily. Many groups use closed, private Facebook groups to communicate. The information is disseminated in a timely manner, anyone in the group can ask questions or add to an ongoing conversation, and they can swap information instantly.

Example: Mock Trial. Georgia College has a fairly large Pre-Law Society for the relative size of its student body. At any one time there are approximately 65-75 people who are involved in this organization. Mock trial (approximately 18-20 students) is an academic team maintained by the society, has a Facebook group. There is only one Mock trial coach for both teams (all of the students). The coach meets with the team throughout the week, but as they have questions, they post them on the Facebook group. If they can be answered by another member of the team(s) they are—if not, the coach will answer them as soon as possible.

Example: College of Education Cohort Mentoring

The Early Childhood, Middle Grades, and Special Education cohort programs require action research in senior coursework. This type of research has been defined as the attempt by teachers to study and improve their practice as a result of classroom experiences (Connelly & Clandinin, 1988).

Numerous studies have indicated that practicing teachers conducting action research as part of their graduate education programs can improve teaching and enhance student learning (Burnaford & Hobson, 1995; Johnson & Button, 2000; Sax & Fisher, 2001). Action research requires all senior cohort students to evaluate their placements. They reflect on improvements that need to be made. This process starts with questioning and reflecting on the effectiveness of various methods implemented with P-12 students who demonstrate the lack of progress with academics or behavior. The first step in the action research cycle is problem formulation. Once problems are identified, cohort students investigate the effectiveness of evidence-based practices that could possibly be implemented to improve behaviors or academics of individual students or groups of students. Following intense investigations of alternatives cohort students select the most practical and effective interventions for their placement settings. Once methods are selected, final questions are defined.

In addition to determining the final questions, cohort students then develop methods of implementing and measuring progress or the lack of it. These methods must include pre-tests or documentation over a week of the present level of performance. Once baselines are established cohort students provide well-documented lists of intervention procedures over several weeks. The time required to implement and collect data will vary. Post-tests are administered following several weeks of interventions, which lead towards the analyses of data collected. This is where cohort students identify various themes, issues, or patterns. This is followed by reflection over the results and the development of conclusions based upon the data's results. All of these steps are reported in research reports, presentations, and even publications.

In the College of Education, all cohort students are required to complete action research projects under the direction and guidance of mentor leaders. These individuals are responsible for periodically meeting, monitoring progress, and giving advice related to the research process. Mentor leaders are also responsible for cohorts maintaining confidentiality and making sure that each project is approved through IRB.

Programs in the College of Education maintain their own specific requirements for evaluating studies and mentors in each program ensure that policies are followed precisely.

References

- Burnafor, G. & Hobson, D. (1995). Beginning with the group: Collaboration as the cornerstone of graduate teacher education. *Action in Teacher Education*, 17: 67-75.
- Connelly, M.F. & Clandinin, J.D. (1988). Studying teachers' knowledge of classroom: collaborative research, ethics, and the negotiation of narrative. *The Journal of Educational Thought*, 22(2): 269-282.
- Johnson, M.J. & Button, K., (2000). Connecting graduate education in language arts with teaching context: The power of action research. *English Education*, 32, 107-126.
- Karcher, M. J. (2005). *Cross-age peer mentoring*. In D. L. DuBois, & M. J. Karcher (Eds.), *Handbook of Youth Mentoring* (pp. 266-285). Thousand Oaks, CA: Sage Publications.
- Sax, C. & Fisher, D. (2001). Using qualitative action research to affect change for professional education. *Teacher Education Quarterly*, 28: 71-80.
- Weresh, M. (2010). I'll start walking your way, you start walking mine: Sociological perspectives on professional development and influence of generational differences. *South Carolina Law Review*, 61.

CHAPTER 8

GEORGIA COLLEGE RESOURCES



GEORGIA COLLEGE RESOURCES

As a case study, Georgia College is a mid-sized public liberal arts college located in rural central Georgia. The institution is the liberal education flagship of the Georgia system. There are approximately 5,900 undergraduates currently enrolled, and the student/faculty ratio is 17 to 1.

Mission

As the state's public liberal arts university, Georgia College offers undergraduate programs of study to talented and motivated students in a residential college setting. Georgia College also provides, at multiple locations, graduate and professional studies that support the needs of the region and create pathways to individual success and personal fulfillment. Its academically engaging, student-centered programs often take learning beyond the traditional classroom and develop the intellectual, professional, and civic skills and dispositions that enable graduates to thrive in an information-intensive and diverse global society. Through its teaching, research, and service, Georgia College enriches the lives of students and their local and global communities.

Funding Sources for Georgia College

Proposal writing is an invaluable skill for both faculty and students to acquire during their time at Georgia College. Writing for grants is uniquely different from the style used for academic papers and like any skill, must be practiced to perfect. In addition to practical skill development, funding will make undergraduate research more feasible and improve graduate school admissions for students through fellowships. There are a number of internal and external funding opportunities available for the faculty and students. To see a list of opportunities, look to Appendix A.

Mentored Undergraduate Research & Creative Endeavors (MURACE) was created to build a culture of undergraduate research across disciplines. MURACE is responsible for the annual Student Research Conference, liaison with the Council for Undergraduate Research (CUR), and funding undergraduate research activities, including the following opportunities:

- [MURACE Implementation Grants](#), \$7,500. To support academic programs and departments that have made progress in integrating undergraduate research across the curriculum, but need additional support to deepen their activities.
- [MURACE Planning Grants](#), \$5,000. To support academic programs and departments that want to integrate undergraduate research across the curriculum, but need to develop a plan of action.
- [MURACE Student Individual Travel Grant](#), Up to \$500 per conference with no more than \$1,000 per academic year. To support undergraduates whose papers/projects have been accepted at national, regional, or state research conferences.
- [MURACE Summer Research Grant](#), \$5,000. To support faculty-student research to pursue original scholarship projects or creative endeavors (i.e. substantial contribution and co-authorship with faculty mentor or one's own personal research project) under the mentorship of a faculty member or become part of a faculty scholarship project. Student researchers will receive a \$2,500 stipend and the faculty mentor receives \$2,000 to

\$3000 depending on the number of students mentored. An additional \$500 can be used for materials, equipment, travel, or other research related expenses.

- Center for Teaching & Learning – on behalf of the Office of Academic Affairs, conducts a semiannual competition for Faculty Research Grants. These grants are for full-time faculty to conduct scholarship, with priority given to working with student over individual scholarship. Funding may not be used for personnel costs.

[Student Green Fee](#) - The Georgia College Student Green Fee was initiated in 2010 to develop collaborative research between students, staff and faculty that will make our campus more sustainable and promote sustainable practices in our community.

[Student Technology Fee Grants \(STF\)](#) – Technology fees are charges to all students at Georgia College and are used to support and supplement normal levels of technology spending. The focus of student technology fees should be on technology related to either academic outcomes or instructional objectives and should be used for the primary benefit of students by:

- Directing expenses to assist students in meeting educational objectives of their academic programs;
- Leveraging with other funds to yield greater resources for students; (Technology fee revenues may be combined with another fund source(s) to make purchases that will enhance technological resources provided to students).

Showcase opportunities for Georgia College Student Scholars

Appendix B includes a list of national and regional conferences for undergraduate research, as well as discipline specific conferences. In addition to presenting research at national and international research conferences, students have access to regional, statewide, and local conferences.

[Conference of Research Experiences for Undergraduates Student Scholarship](#) – This conference is for students who demonstrate the successes of the REU program in general either through broadening participation, encouraging undergraduates to pursue scientific and technical careers, or outstanding research accomplishments.

[COPLAC Southeast Regional Undergraduate Research Conference](#) - Students at COPLAC institutions have the opportunity to present the results of their undergraduate research at regional conferences where they can meet and discuss their work with peers and faculty members. Undergraduate research projects span the disciplines and afford students the prospect of intellectual engagement beyond the formal classroom setting.

[CUR Posters on the Hill](#) - It is increasingly important that the undergraduate research community works to ensure that those in the U.S. Congress who provide funding for research and education have a clear understanding of the programs they fund and why these programs are important.

[CUR Undergraduate Journal Clearinghouse](#) - This website lists journals of professional organizations, academic journals and institutional publications that accept submission from undergraduate researchers.

[CUR Undergraduate Presentation Opportunity Clearinghouse](#) – This site lists a variety of opportunities by discipline or region that Undergraduate Research students can present their work.

[CUR Undergraduate Research Highlights](#) - a database that consists of brief descriptions of recent (past six months) peer-reviewed research or scholarly publications in scholarly journals. These publications must be in print and must include one or more undergraduate co-authors. Highlights selected for inclusion are published in the CUR Quarterly either in print or included in CURQ on the Web.

[Georgia Undergraduate Research Conference](#) - a colloquium designed to showcase the depth and breadth of creative scholarship occurring throughout the southeast. This conference is for undergraduate researchers in all disciplines and provides a venue for students to present their work to a wide audience and encourages all to become active in professional conferences.

[Metamorphosis](#) - First published in 2009, Metamorphosis features scholarly and creative work at COPLAC member institutions across the United States and Canada. The journal is interdisciplinary by design, highlighting work in the natural sciences, social sciences, humanities, arts and professional programs.

[National Conference on Undergraduate Research](#) - The mission of the National Conference on Undergraduate Research (NCUR) is to promote undergraduate research scholarship and creative activity done in partnership with faculty or other mentors as a vital component of higher education.

[Georgia College Student Research Conference](#) - Student Research in this context is interpreted as any scholarly or creative activity ranging from scientific experimentation, to service-learning, to literary criticism, to case-study design, to artistic expression, and so on. As such, students from all disciplines are invited to submit their work to be showcased at the GC Student Research Events.

[The Corinthian](#) - The Journal of Student Research at Georgia College since 1999 - This scholarly journal, published every spring, recognizes student achievement in research by providing publishing opportunities for undergraduate and graduate GC students from all disciplines.

[The Peacock's Feet](#) – First published in 1977, The Peacock's Feet is a yearly journal published by Georgia College, and showcases the literary and artistic talents of people from Georgia College and beyond. This journal includes some of the finest stories, poems, and art the school has to offer. The Peacock's Feet takes art and literary submissions every year up until December.

[Women's Studies Student Symposium](#) - This event aims to bring together young scholars from across disciplines at Georgia College and beyond for a day of intellectual and creative exchange centered on issues pertaining to Women and Gender. Research papers and creative projects such as fiction, poetry, posters and artwork relating to the Women and Gender from a national or global perspective, are welcome.

APPENDICES



APPENDIX A: EXTERNAL SOURCES OF FUNDING

Author Note: If the hyperlink does not work, Google the title.

External Federal Funding

Air Force Office of Scientific Research

- [Research Interests of the Air Force Office of Scientific Research](#)

Bureau of Educational and Cultural Affairs

- [Open Competition for Professional Fellows Program](#)

Bureau of Justice Assistance

- [BJA Second Chance Act Adult Mentoring and Transitional Services for Successful Reentry Program](#)
- [BJA Visiting Fellows Program](#)

Department of Commerce/National Oceanic and Atmospheric Administration

- [Chesapeake Bay Summer Internship Program](#)
- [EPP/MSI Undergraduate Scholarship Program](#)
- [Ernest F. Hollings Undergraduate Scholarship Program](#)
- [Geosciences Bridge Program](#)
- [LiMPETS Network](#)
- [National Centers for Environmental Prediction Summer Student Intern Program](#)
- [Sea Grant Dean John A. Knauss Marine Policy Fellowship](#)

Department of Education

- [Office of Special Education and Rehabilitative Service \(OSERS\): National Institute on Disability and Rehabilitation Research \(NIDRR\): Research Fellowships Program](#)

Department of Energy

- [Nuclear Energy University Programs - Fellowship and Scholarship](#)
- [Office of Science/Office of Workforce Development for Teachers and Scientists \(WDTS\) - Science Undergraduate Laboratory Internship \(SULI\) program](#)

Department of Transportation

- [Dwight D. Eisenhower Fellowship Program](#)

Environmental Protection Agency

- [EPA Greater Research Opportunities \(GRO\) Fellowships For Undergraduate Environmental Study](#)

NASA Headquarters

- [ROSES: Fellowships for Early Career Researchers](#)
- [Experimental Program To Stimulate Competitive Research - EPSCOR](#)
- [Langley Aerospace Research Summer Scholars \(LARSS\) Program](#)

National Institute of Food and Agriculture

- [Agriculture and Food Research Initiative \(AFRI\): NIFA Fellowships Grant Program](#)

- [Agriculture and Food Research Initiative - Childhood Obesity Prevention](#)

National Institutes of Health

- [Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral MD/PhD and Other Dual Doctoral Degree Fellows \(Parent F30\)](#)
- [Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral Fellows \(Parent F31\)](#)
- [AHRQ Individual Awards for Postdoctoral Fellows \(F32\) National Research Service Awards \(NRSA\)](#)
- [Ruth L. Kirschstein National Research Service Awards \(NRSA\) for Individual Senior Fellows \(Parent F33\)](#)
- [Short-Term Research Education Program to Increase Diversity in Health-Related Research \(R25\)](#)

National Institute of Justice

- [NIJ Graduate Research Fellowship Program](#)
- [Research on Teen Dating Violence in Understudied Populations: Postdoctoral Fellowship FY 2013](#)
- [Building and Enhancing Criminal Justice Researcher - Practitioner Partnerships FY 2013](#)

National Institute of Standards and Technology

- [Graduate Student Measurement Science and Engineering \(GMSE\) Fellowship Program](#)
- [Measurement Science and Engineering \(MSE\) Research Grant Programs](#)
- [Summer Undergraduate Research Fellowship \(SURF\) NIST Boulder Programs](#)
- [Summer Undergraduate Research Fellowship \(SURF\) NIST Gaithersburg Programs](#)

National Science Foundation

- [Research Experiences for Undergraduates \(REU\)](#) – database of sites by discipline, keyword or location
- [NSF/FDA SCHOLAR-IN-RESIDENCE AT FDA](#)
- [Documenting Endangered Languages](#)
- [Grant Opportunities for Academic Liaison with Industry](#)
- [Robert Noyce Teacher Scholarship Program](#)
- [Education and Special Programs](#)
- [Workforce Program in the Mathematical Sciences](#)

Office of Naval Research – Educational Activities for Undergraduate and Graduate students

- [Naval Research Enterprise Intern Program \(NREIP\)](#): This 10-week intern program is designed to provide opportunities for undergraduate and graduate students to participate in research, under the guidance of an appropriate research mentor, at a participating naval laboratory.
- [Science, Mathematics and Research for Transformation \(SMART\)](#): The SMART Scholarship for Service Program has been established by DoD to support undergraduate and graduate students pursuing degrees in science, technology, engineering and mathematics disciplines.

US Agency for International Development

- [Health System Strengthening Project](#)

- [Leadership Initiative for Good Governance in Africa \(LIGGA\) Annual Program Statement \(APS\)](#)

US Department of Agriculture

- [Roman L. Hruska U.S. Meat Animal Research Center](#)

State Department

- [Young Turkey / Young America: A New Relationship for a New Age](#)

Council on Undergraduate Research

- [Student Research Opportunities](#)

Discipline Specific Funding

- [American Association of Medical Colleges](#): Summer undergraduate research programs in medicine
- [American Economic Association](#): Summer Study, Research, and Presentation Opportunities
- [American Physiological Society](#): The society provides fellowships and awards to encourage excellence in physiology education
- [American Psychological Association](#): Summer Science Fellowship
- [American Psychological Society](#): Student grant program
- [American Society for Microbiology](#): Opportunities for UGR fellowships and student travel grants
- [American Society for Microbiology](#): This organization offers fellowships for underrepresented students for summer research programs
- [American Society of Plant Biologists](#): Summer Undergraduate Research Fellowship
- [Annie's Homegrown Inc.](#): Sustainable Agriculture Scholarships
- [Beta Beta Beta](#) Foundation Research Scholarship Application: to support undergraduate research by awarding cash scholarships annually to students conducting student research
- [Botanical Society of America](#): Opportunities for UGR research awards and student travel grants
- [Emergency Nurses Association Foundation](#): Undergraduate Scholarships
- [Fast Web Free Scholarship Search](#): Link to a list of national scholarships available to undergraduates
- [Geological Society of America](#) (GSA): Student travel grants
- [Institute for International, Comparative, and Area Studies](#) (IICAS): The institute offers research and travel grants primarily in the social sciences and humanities
- [McNair Program](#): This program is open to low-income, first generation college students and underrepresented minorities
- [National Strength and Conditioning Foundation](#): Student research grants and scholarships
- [National Wildlife Federation](#): Campus ecology programs
- [Psi Chi](#), the National Honor Society in Psychology: Numerous awards & grants
- [Society for Integrative and Comparative Biology](#): This scholarship provides assistance to students to take courses OR to carry on research on INVERTEBRATES at a marine, freshwater, or terrestrial field station
- [Society of Physics Students](#): The SPS summer internship program offers 10-week positions for undergraduate physics students in science research, education and policy with various organizations in the Washington, DC area. All internships include paid housing, a competitive stipend, a commuting allowance, support to attend a national

physics meeting in the year following the internship, and transportation to and from Washington, DC.

- [Strauss Foundation](#): Research fields eligible for funding include health, education, law, the environment, and more
- [UNCF/Merck Science Initiative](#): Scholarships and fellowship at the undergraduate, graduate or postdoctoral levels in a life science, physical science or engineering program

UGR Student Opportunities at Federal Agencies

- Centers for Disease Control and Prevention, [Career Training Fellowships](#)
- Centers for Disease Control and Prevention, [Public Health Training Fellowships](#)
- Department of Energy, [Science Undergraduate Laboratory Internships](#)
- Environmental Protection Agency, [Fellowships and Scholarships](#)
- National Aeronautics and Space Administration, [Undergraduate Student Research Program](#)
- National Institutes of Health, [Other Summer Programs @ The NIH](#)
- National Institutes of Health, [Summer Internship in Biomedical Research](#)
- National Institutes of Health, [Undergraduate Scholarship Program](#)
- Smithsonian Institution [Internships](#) *please note this is a great opportunity for all disciplines

APPENDIX B: LIST OF UNDERGRADUATE AND DISCIPLINE-SPECIFIC CONFERENCES

Undergraduate Research Conferences and Publications

[Conference of Research Experiences for Undergraduates Student Scholarship](#) – This conference is for students who demonstrate the successes of the REU program in general either through broadening participation, encouraging undergraduates to pursue scientific and technical careers, or outstanding research accomplishments.

[COPLAC Southeast Regional Undergraduate Research Conference](#) - Students at COPLAC institutions have the opportunity to present the results of their undergraduate research at regional conferences where they can meet and discuss their work with peers and faculty members. Undergraduate research projects span the disciplines and afford students the prospect of intellectual engagement beyond the formal classroom setting.

[CUR Posters on the Hill](#) - It is increasingly important that the undergraduate research community works to ensure that those in the U.S. Congress who provide funding for research and education have a clear understanding of the programs they fund and why these programs are important.

[CUR Undergraduate Journal Clearinghouse](#) - This website lists journals of professional organizations, academic journals and institutional publications that accept submission from undergraduate researchers.

[CUR Undergraduate Presentation Opportunity Clearinghouse](#) – This site lists a variety of opportunities by discipline or region that undergraduate research students can present their work.

[CUR Undergraduate Research Highlights](#) - a database that consists of brief descriptions of recent (past six months) peer-reviewed research or scholarly publications in scholarly journals. These publications must be in print and must include one or more undergraduate co-authors. Highlights selected for inclusion are published in the CUR Quarterly either in print or included in CURQ on the Web.

[GURC](#) - a colloquium designed to showcase the depth and breadth of creative scholarship occurring throughout the southeast. This conference is for undergraduate researchers in all disciplines and provides a venue for students to present their work to a wide audience and encourages all to become active in professional conferences.

[Metamorphosis](#) - First published in 2009, Metamorphosis features scholarly and creative work at COPLAC member institutions across the United States and Canada. The journal is interdisciplinary by design, highlighting work in the natural sciences, social sciences, humanities, arts and professional programs.

[National Conference on Undergraduate Research](#) - The mission of the National Conference on Undergraduate Research (NCUR) is to promote undergraduate research scholarship and creative activity done in partnership with faculty or other mentors as a vital component of higher education.

Discipline Specific Conferences

[ACS \(American Chemical Society\) National Conference](#) - ACS Meetings organizes two of the most respected scientific meetings in the world. Our National Meetings offer scientific professionals a legitimate platform to present, publish, discuss and exhibit the most exciting research discoveries and technologies in chemistry and its related disciplines. Furthermore, our national meetings facilitate networking opportunities, career development and placement, and provide companies an opportunity to exhibit products and services to a targeted audience.

[American Anthropological Association Annual Conference](#) - Anthropologists have long been engaged with diverse publics and with other social sciences. The influence of anthropological methods, concepts and research is growing, as witnessed by the fact that over half of us are now employed outside the academy. Our journals are experimenting with new formats to link research to contemporary concerns. We engage with rapidly changing media technologies to reach diverse audiences and explore different pathways to activism, collaboration, and scholarship. By locating the human at the center of its inquiry, anthropology through all of its fields provide crucial methodological and political insights for other disciplines.

[American Economic Association \(AEA\)](#) - Several economics associations invite undergraduates to present essays at their annual meetings and some award prizes for the best essay. Other organizations invite participation by undergraduates and provide summer and other opportunities for college students to pursue their interest in economics.

[American Physical Society](#) - Students are invited to various professional sessions including a chance to participate in an open discussion with a panel of working physicists representing diverse career paths—national lab research, science policy, and industry.

[American Psychology Association](#) – annually the APA holds a national conference that welcomes students.

[American Public Health Association Annual National Student Meeting](#) - The purpose of this meeting is to bring students together to discuss innovative advancements in public health. Professionals along with student group leaders have been invited to speak about health issues, wellness and prevention, and professional development

[Association Psychology Science](#) - The Society for a Science of Clinical Psychology (SSCP) hosts an annual student poster session at the APS Annual Convention and the APS Student Caucus sponsors two research award competitions for students each year at the convention: the Student Research Award and the RISE Research Award.

[Council for Exceptional Children](#) - The Council for Exceptional Children (CEC) works to improve the educational success of children and youth with disabilities and/or gifts and talents.

[Middle Georgia Diversity Conference](#) - The Student Diversity Conference Committee is soliciting proposals from students and faculty for presentation sessions or poster sessions. Diversity issues may include topics such as race, ethnicity, gender, ESOL, sexual orientation, special needs, and socio-economic impacts on education. Conference is coordinated through Fort Valley State University and Georgia College & State University; therefore, the link is updated yearly.

[National Undergraduate Literature Conference](#) - The NULC is your opportunity to present your best critical and creative work to an audience of like-minded students from campuses across the country. You'll also hear some of the most important writers in contemporary literature.

[National Women's Studies Association](#) - NWSA's annual conference regularly draws more than 1,500 attendees and is the only annual meeting in the US exclusively dedicated to showcasing the latest feminist scholarship.

[NOBCCChE](#) - The National Organization for the Professional Advancement of Black Chemists and Chemical Engineers: NOBCCChE (pronounced No-be-shay) was incorporated in 1975. NOBCCChE's Mission is to build an eminent cadre of people of color in science and technology

[Southeast Conference for Undergraduate Women in Physics](#) - SCUWP's goal is to help undergraduate women continue in physics by providing them with the opportunity to experience a professional conference, information about graduate school and professions in physics, and access to other women in physics of all ages with whom they can share experiences, advice, and ideas. Our program includes research talks by faculty, panel discussions about graduate school and careers in physics, presentations and discussions about women in physics, laboratory tours, student research talks, a student poster session, and several meals during which presenters and students interact with each other.

[Southeastern Psychology Association](#) – This is an annual meeting that includes many sessions and events for undergraduates. Student Research Paper Awards and the Psi Chi Undergraduate Research Program are just two of the specific events among the professional sessions available.

[The Congress on Research in Dance Conferences](#) - This conference invites a reflection on the impact that these developments are having on dancers and dances, and the ways in which practitioners and scholars understand dance practices in political, cultural, and historical terms. Pursuing these reflections, the Society of Dance History Scholars (SDHS) and Congress on Research in Dance (CORD) will hold a historic joint conference that also commemorates the 20th anniversary of the Ph.D. in Critical Dance Studies at the University of California, Riverside. Papers, panels, roundtables, and non-conventional forms of presentations (including performative papers, performances, and workshops) might examine how dance and choreographic attention to movement, flows, stops, pauses, turns, improvisation, and the like inform us

[Undergraduate Literature & Creative Writing Conference](#) - Undergraduates from Susquehanna and other universities around the country share their scholarly and creative work at this annual conference. Panels of three or four students are organized around various literary themes and cultural issues. After reading their work aloud, student panelists and the audience of aspiring writers, teachers, and scholars join in a discussion.

INTRODUCTION

In this section, the goal is to provide some background for your topic, and then to present your research idea and hypotheses in a straightforward and concise manner. (approx. 250 words) You should include the following.

Background research

Provide a context for your particular topic by briefly discussing previous research. It should be concise – about 3-4 sentences is ideal. You should cite sources from peer-reviewed journals (or other appropriate sources) while discussing relevant background research. Use APA 6th edition guidelines when citing sources.

It is not appropriate to use direct quotes from other sources in a poster. Space is at a premium, so think about simple summaries of background research rather than detailed descriptions (i.e., "Previous research has demonstrated..."). Keep in mind that the people reading your poster very well may not be familiar with your area of research, so make the poster as readable and to-the-point as you can.

Research question

Provide the main point of the research you are presenting. What is the purpose of your study? Try and keep this part simple and straightforward.

Hypotheses

Present the specific pattern of results you hope to find in your study. If you have multiple hypotheses, use bullet points or numbers to keep them distinct. Your poster may only be presenting part of a study, or only some of the study's hypotheses. Make sure that you avoid sidebars or extraneous and potentially confusing information.

METHOD

In this section, the goal is to provide relevant information about your participants (if human research) / subjects (if animal research), research design/conditions, and procedure.

Participants/Subjects

If working with a human population, identify the number of participants, as well as other relevant demographics. Typically, it is appropriate to identify how many males and females were participants, as well as the mean age of participants, and any other demographic information that is pertinent to the research question. If working with a non-human population, identify species, and, if possible, the number of subjects of each gender.

Materials & Design

Identify the various conditions in your study, as well as the study's basic design. Was it repeated measures? Between-participants? Were the groups randomly assigned? In addition, identify the various measures participants completed. If a measure is commonly used, you should provide the name of the measure. If the measure was created by you for the purposes of the study, briefly describe the measure and provide one or two sample items. It is also appropriate to provide indicators of reliability for the measures (i.e., Cronbach's alpha). You can also briefly describe any other relevant materials. It is also appropriate to include pictures of your stimuli.

Procedure

Briefly describe the procedure of the study. What did each condition/participant experience during the study? Try to avoid unnecessary information that may not be central to the research question.

RESULTS

The purpose of this section is to briefly summarize your results. Identify which tests were performed on the data (t-tests? One-way ANOVA? Chi-Square?), and report all relevant statistics, including degrees of freedom, mean and standard deviation values for the various groups, p-values, and effect sizes. It is also appropriate to include one or two figures.

Sample Stimuli/ Table/Figure Here

illustrating your results. Use APA style formatting for any figures. Your study's results section should reflect your hypotheses. If you specify that you are expecting a certain pattern in your hypotheses, test that pattern and report it in your results section. If presenting a study proposal, present expected pattern of findings rather than actual findings.

DISCUSSION

The purpose of this section is to address the following (approx. 200 words):

Summary of results

Briefly summarize your results and address whether your hypotheses were supported.

Implications/Future research

Use your discussion section as an opportunity to briefly discuss the broader implications of your study, and future research. What can be learned from the study? What other research can this study generate? What is the "next step"?

REFERENCES

You can provide all references cited in the poster formatted using APA style. This is optional, if there is enough room on the poster.

Provide the e-mail information for the first author.

APPENDIX C: SAMPLE POSTER

APPENDIX D: LABORATORY NOTEBOOK INSTRUCTIONS

The Principle of Autonomous Replication

The goal of writing in a laboratory notebook is to create a record that anyone can use to perform the same procedures and obtain the same results—using only your laboratory notebook. This is known as “the principle of autonomous replication.”

Indications that you have fulfilled the requirements for the principle of autonomous replication include:

- Drawings, figures, and tables are encouraged. They must contain enough information that another scientist can interpret them without extensive reference to the text.
- Jargon, personal shorthand, and personal abbreviations should be kept to a minimum (unless you have a list of abbreviations in the notebook).
- The level of detail should be high enough that you can go back at any time and troubleshoot your procedures if, for some reason, a procedure does not work or yields questionable results.

Writing in a Laboratory Notebook

This is an outline of the minimum information required in a laboratory notebook. *Italicized portions are suggestions.* You may, however, want to arrange and organize your notebook in your own way. You must write in your lab notebook as you perform the procedure. Your memory is not reliable. Experiments without sufficient documentation must be discarded. The results cannot be disseminated!

- **Date:** Date each page of the notebook. It is imperative that you record everything in your notebook as you do it.
- **Aims and Purpose:** This is a thumbnail sketch of the reason you are performing the protocols and experiments for the day. It should stand alone as your rationale. In other words, anyone should be able to open your notebook to any experiment and understand the “why” of the laboratory work performed. *State (or restate) any hypothesis or expected results here. This acts as a framework from which you can build your analysis (below).*
- **Materials:** All materials should be listed. This helps you, and anyone reading the notebook, repeat procedures with the same supplies.
- **Procedures and Protocols:** This should be a comprehensive, accurate, and detailed step-by-step accounting of your procedure. Even if you are repeating a protocol without any changes, write out the exact steps.
- **Results:** The description of any results must be comprehensive and accurate. Primary data (numerical values, photographs, printouts, and all observations) should be listed first. Anything taped into the notebook must be dated and initialed. Primary data can later be sorted or organized into tables, graphs, charts, or diagrams. Any reader should be able to read the results of an experiment and know exactly what happened.

- **Analysis and Interpretation:** An objective and balanced analysis must be documented in the laboratory notebook. Even if the results indicate a simple “yes” or “no” answer, it is important to state that in this section. Report any unexpected findings or problems during the course of the experiments. This can act as a rationale for additional experiments, for changing the protocol or materials, or for changing the path that your research has been following. Interpretation of data can sometimes be subjective, but your reasons for a particular interpretation *must* be stated here.
- **Future Plans:** Based on your interpretation of the data, you should end each experiment or day of recording in your notebook with a short outline of your next step or steps. *The rationale for this should be clear in your “analysis” section and does not necessarily have to be restated.* This will lead you and the reader into the next procedure with a clear idea of the short- and long-term goals of your work.

The Big Picture

When scientific data are published, the source of the data (namely, the laboratory notebook) belongs to, and must be retained by, the laboratory for *at least seven (7) years*. The notebook should, therefore, be a document that can be read and understood for years to come even if, and especially when, science moves on from the point of discovery outlined in the notebook.

It is a good idea to number and initial each page as you complete your write-up.

APPENDIX E: ACTION RESEARCH ACTIVITY INSTRUCTIONS FOR COMPLETING A FUNCTIONAL BEHAVIORAL ASSESSMENT AND BEHAVIORAL INTERVENTION PLAN FOR CHANGING INAPPROPRIATE CLASSROOM BEHAVIORS

- **Data Collection Project (50 points):** Choose a student in your class(es) who is exhibiting behavior that interferes with his/her learning or the learning of others. Using the most appropriate recording technique, collect and graph baseline data (minimum of five data points) on the behavior. Provide the following information in the written presentation and attach raw data sheet(s).
 - Student Background and Description,
 - operational definition of target behavior,
 - rationale for selection of behavior,
 - alternative behavior identified (“fair pair”),
 - data collection method used,
 - rationale for selection of data collection method,
 - baseline graph, and
 - behavioral objective for increasing incompatible/alternative behavior
- **Group Contingency (25 points):** Develop a group contingency plan that increases the alternative behavior identified in Assignment #3. Use the baseline data collected for Assignment #3. Implement the group contingency and continue to collect data for five days. Be sure to collect data on the same behavior and using the same method as you did in Assignment #3. Submit a paper describing the contingency and providing the results. In the narrative, identify the type of contingency used (i.e., independent, dependent, interdependent). Be specific in describing how you established the contingency, presented it to the students, and collected data (appropriate format and system). Speculate on how you might modify the contingency if it was not effective or could start to fade the contingency if it was effective. Provide the baseline and implementation data on the same graph with phase change indicated.
- **Functional Behavioral Assessment (50 points):** Select a student who demonstrates behavior that interferes with his/her learning or the learning of others. Make sure that an operational definition of a target (problem) behavior is written. Then collect at least 5 days of function-specific data about the antecedents, consequences and student’s reactions to the consequences for the target behavior. Collect sufficient data to allow you to confidently determine the function of the behavior (you may need more than 5 days). Use the ABCD forms provided in class to capture these data. Attach these raw data sheets when submitting the assignment. Complete and attach the assessment summary sheets for systematically analyzing the data. Write a relationship statement (hypothesis) about the function(s) of the target behavior. Explain how you came to that conclusion. Make references to specific data that were collected to support your conclusion.
- **Behavior Intervention Plan (100 points):** Develop a BIP based on the function identified for the target behavior in Assignment #5. Collect 5 days of baseline data on the behavior (may be able to use some/all/part of the data collected in Assignment #5 for baseline).

Then, specify and implement five (5) antecedent modifications. Simultaneously, meet with the student to discuss an individualized reinforcement-based intervention (DRA) that can be used to increase the opposite of the target behavior (“fair pair”). In the write-up, you will

describe exactly what you did to intervene, what the contingency was, and how often you reinforced the alternative behavior. Plan ahead for what you will do when the inappropriate behavior occurs (e.g., how will you handle an extinction burst?).

Starting with the first day of implementation, collect five days of intervention data. Graph both baseline and intervention phases. Be sure to label the graph appropriately (at least five data points in the baseline phase and at least five data points in the intervention phase).

Compute the percent of change that occurred as a result of the BIP. (Percent of change is computed by: 1) subtracting the mean of the intervention data from the mean of the baseline data; 2) divide the result by the baseline mean; 3) multiply by 100.)

In the write-up, discuss the effectiveness of your intervention and what you would do differently next time (and why). Refer to the rubric for additional guidance for preparing the project. Remember to attach raw data.

APPENDIX F: RESEARCH LAB SYLLABUS

PSYC 3999, 4999, 4990: Advanced Research Topics

Instructor:

Office Hours:

Office:

E-mail:

Phone:

Prerequisites: Permission of the instructor

Weekly Lab Meeting: Once a week, we will get together as a lab. We'll use this opportunity to discuss current research, cover advanced research topics through a combination of lecture and discussion, and discuss how any current research projects are coming along.

Weekly Team Meeting: Once a week, you will meet with me in my office in smaller groups. These groups will develop and work on research projects throughout the semester. We will be working on both lab research (in my area of social comparison and social emotions), and other social psychology research that individuals will develop. If you are a 3999 or a non-capstone 4999, you will help out with senior projects, and work on one of the lab research projects we'll all be doing together. During the first half of the semester, time will be spent generating pilot data materials, developing new study procedures, and writing proposals for the IRB. During the second half of the semester, we will work to collect and analyze data.

Capstone: The senior capstone for research is now designated as a 4990. If you are taking a capstone with my lab, you must inform me if you plan to complete this capstone in the fall or spring semesters. A capstone project will involve several components:

- You will be primarily in charge of developing an IRB proposal based on an original idea,
- you and your labmates will collect data, and
- you will analyze the data and present it in one of two forms: either as a poster during the semester poster presentations, or written up as an APA style paper. In addition, you will present your findings in an oral capstone presentation at the end of your designated semester.

Students that are taking research with me in the fall who plan to finish their capstone in the spring will be designated as 4999 for fall and 4990 for spring. During the fall semester, you will work with me to develop your capstone project.

Running Sessions: During the course of the semester, will be asked to commit to three hours a week to run participants. I will try and make this as equitable as possible, and will make sure that it is a time commitment that works with your school and extracurricular schedules. If you want to run participants for more than three hours a week (especially if it is your own project!), that is fine.

Journal Readings: One of the goals of this class is to explore the variety of Social Psychology research that is currently being published in the field. To that end, you'll be reading one journal article from a current social psychology publication each week, talk about it in your weekly journal entry, and present a brief summary of it to the rest of the lab. There is a list of Social

Psychology journals below that you can choose from. Most of these journals are published monthly, so you should have no difficulty finding new material each week.

I expect you to draw from the most recently available edition of each journal in question – so if the most current issue of JPSP is from January 2011, I expect you will look at that issue for an article that interests you. Most of the journals listed below have articles that are accessible online in PDF form. Some of the journals have a 1-year or 6-month delay – so the most currently accessible issue in September 2012 may be from December 2011 or August 2012. I do not mind, as long as you use the most current issue of that periodical that you can access. Finally, three of the journals are available only in hard copy form at GC&SU's library.

I suggest you look up the most recently available issue from a journal, and read all the titles/abstracts of that issue. Find one that covers a topic that looks like it might be interesting to you, and see what you think about it. Please read the ENTIRE article – not just the abstract.

I anticipate that some of the articles might be tough for you to work through. If you are having extensive problems, you can always chat about the article with me, before lab, or you can switch to another less hairy study.

Here are the journals you can use:

- Journal of Personality and Social Psychology (online)
- Personality and Social Psychology Bulletin (online)
- Journal of Experimental Social Psychology (GC&SU library)
- Journal of Research in Personality (GC&SU library)
- Social Psychology Quarterly (online, but 1 year delay)
- Journal of Applied Social Psychology (GC&SU library)*
- Basic and Applied Social Psychology (online, but 1 year delay)*
- Journal of Applied Psychology (online)*
- Cognition and Emotion (online)
- British Journal of Social Psychology (online, but 6 month delay)
- European Journal of Social Psychology (online, but 6 month delay)
- Social Neuroscience (online, but 1 year delay)

*If you are interested in I/O Psychology, these journals might be useful for you to explore.

Log entries: Each week, you need to write a log entry that discusses your weekly reading answering the questions below, as well as the progress of the research projects that you are working on. You can use this as an opportunity to expand on lab meetings, to discuss issues you may have experienced while running subjects or developing materials, etc. I anticipate these log entries to be about 1 page long. Log entries are due at each weekly lab meeting, and can be submitted in "hard copy" form at the meeting. **NOTE:** If a Friday lab meeting is cancelled or you must be absent, you are still expected to submit a log entry for the week, either through e-mail or placed in the box outside of my office.

Questions to Answer About Weekly Reading in Log Entry:

- What is the main hypothesis studied in the paper?
- What is the basic procedure of the studies presented in the paper?

- Can you briefly summarize the main findings of the study?
- According to the Discussion section, what were the overall implications of the study?
- What is your general opinion on the paper? Did you have difficulty understanding parts of it?
- What do you think about the author's conclusions, how they ran their study, and how they described their reasons for doing the study?

Additional Readings: As we go through the semester, I will assign additional readings that cover topics in advanced research methods techniques, research ethics, and social psychology that you will be asked to read as a class. I will assign these readings 1 week before they are due, and will post them in PDF form on Georgia View. Be prepared to discuss them in class. You will not have an additional reading to do every single week, and during the weeks when I have not assigned a reading, you are still expected to do your independent journal reading for class.

Grades: 3999, 4999: Each week, I'll give you 1 attendance point each for the Friday meeting and the small group meeting, and 1 point for writing your log entry. If you miss more than 6 points in whatever combination, you will get a grade of "U" for the course. **4990:** You will be graded based on completion of your senior project.

Running participants: I expect you to commit to three hours a week to run participants in experiments.

Letters of recommendation: A letter of recommendation is not automatically guaranteed, it is earned. If you would like a letter of recommendation, you must let me know two weeks in advance of the letter being due. Please remember that I will be asked to talk about your professionalism, leadership, maturity, and responsibility in a candid manner when writing said letters, so be sure that your lab behavior models the report you would like me to give.

APPENDIX G: STUDENT RESEARCHER SAFETY GUIDE

Lab Manual PSYC 3999, 4999, 4990

Participant-Focused Research

Our first responsibility as researchers is to our participants. This includes respecting our participants' rights and agency, minimizing any harm they experience, and maintaining their trust. One way we respect our participants is by respecting their rights to be informed, decline participation in the experiment, decline use of their data, and to have their questions answered.

NIH Certification: All people enrolled in lab must complete the NIH certification for human participants in order to participate in lab activities.

Informed Consent: This part of the process is **very** important for research purposes. During the process of informed consent, participants read through a document that describes the purpose of the study, the length of the study, any compensation they may be given, and their right to withdraw from the study without penalty. The informed consent form also provides contact information for the primary investigator, as well as for the IRB.

Filling out the Form: Participants must be given as much time as needed to read through the document, must be given the opportunity to ask questions about the document. It is also important that they sign and date the document to indicate that they read the information provided, and by signing, agree to participate in the research experiment.

Additional Copy: Participants must receive a blank copy of the informed consent form once they have finished the experiment. This ensures that should they have any issue with the experiment, that they will have access to a copy of the form they originally filled out, as well as the contact information of both the experimenter and the IRB. Participants with potential complaints could then go straight to the IRB with their issues, which provides transparency and gives participants personal agency.

Informed Consent Storage: For confidentiality purposes, we store the informed consent form (and other forms with identifying information, such as permission to use data form) separately from any other type of data collected, whether it be questionnaires, responses on a computer, or other forms of data. In addition, we do not collect identifying information such as names or social security numbers on our questionnaires. This means that participants' names cannot be linked to their responses, which ensures confidentiality. All forms with identifying information are typically placed in their own designated folder, separate from other data. These forms should also be stored in a secure room (i.e. my office or one of the lab rooms).

Debriefing: Whenever studies use deception, we must debrief the participants in order to fully inform them about the nature of the experiment. This is another very important portion of the experiment. During the debriefing session, participants are given information about the true research question, as well as why the deception was necessary. Finally, they complete a permission to use data form.

Filling Out the Form: Participants must be given as much time as needed to read through the document, must be given the opportunity to ask questions about the document. It is also important that they sign and date the document, to indicate that they read the information provided, and by signing, agree to let us use their data.

Permission to Use Data Storage: For confidentiality purposes, we store the permission to use data form with the informed consent form, as both include identifying information.

FAQ:

Q: Help! There are not any copies of the informed consent form/permission to use data form!

A: There are usually blank copies of both forms in the “copies” folder of any experiment. You can take this form to the Psychology Department office (1-03) and request that copies be made. If the Department office is closed and I am not in my office either, you must cancel the session and give the participant credit for showing up.

Q: I forgot to give them an extra copy of the informed consent form at the end of the study.

A: Let me know, and I will e-mail them a copy.

Q: My participant did not sign the informed consent form because he/she did not wish to participate.

A: If the person in question has read the form and decides not to sign it, he or she has not participated in the study. The person is free to leave. Make sure the person understands that as they chose not to participate, they will not be receiving credit.

Q: My participant changed his/her mind halfway through the study, and has decided to withdraw from the study prematurely.

A: The participant can leave the study at any time without being penalized. Thank them for their time, and tell them they are free to leave. As this situation can be different from case to case, I would prefer that you e-mail me informing me of what has happened, and I will contact the participant and handle their debriefing and credit hours myself.

Q: My participant checked that they did not want their data used in the experiment.

A: You must make sure that you destroy their data. If I am not in my office, walk the participant to the Psychology Department Office (A&S 1-03) and hand over any data (questionnaires) to Brenda, and ask her to shred them for you so that the participant sees that the data has been destroyed. If it is a computer program, go through the steps of deleting their file from the research experiment in front of them. Only shred or delete the data. Do **not** destroy the informed consent form or permission to use data form. Please inform me if any participant declines the use of their data.

Other Participant Respect Considerations: We respect our participants by showing up on time to run sessions, by completing sessions by the time they are expected to end, by addressing them in a polite manner, by being professional in demeanor, and by addressing any questions they have. We have a responsibility to be good stewards of research, and the best way we can do that is by remembering the responsibility we have to our participants.

FAQ:

Q: I cannot be there to run a session.

A: There are many ways you can address this, depending on how immediate your conflict is. If you know enough in advance, you can arrange for a labmate to take over your session. If it is last-minute, contact me so that I can let the participant know that the session has been cancelled, or run the session myself. Use common sense, be responsible, and plan ahead.

If you miss a session for any reason, even if you have made arrangements to have the session covered by a labmate, please e-mail me to let me know.

Q: My participant appears to be angry/dissatisfied with their research experience.

A. Attempt to address any questions or concerns they have in a respectful manner, and e-mail me to let me know what has happened.

Participant and Researcher Safety: Sessions are always run during normal business hours (9-5), which means that faculty and staff will be in the building. Your first step when dealing with a potential safety issue is to see whether I am in my office. The second step is to contact the Psychology department main office and see if the department Chair or Secretary can provide assistance. If none of us are immediately available in an emergency situation, the next person to contact is the secretary in the Dean's office. You can also contact campus police.

Phone numbers:

My phone:

Department phone:

Dean's Office phone:

Campus police:

Here are a few additional things you might need to think about:

- If a session has to stop because of an issue outside of your control (i.e. a fire drill, bad weather, an unexpected health incident), your first priority is the safety of both the participant and yourself. Once the issue has been resolved, if you can resume the session and finish in a timely manner, ask the participant if he or she would be willing to do so. In these cases, it is standard that the participant will receive credit regardless of whether the session has been completed. Furthermore, if it was not possible to fully debrief the participant or have him or her sign a permission to use data form, let me know so that I can make sure these steps take place.
- If at ***any time*** you feel unsafe due to a participant's behavior during a study, remember that your safety is important too. You have the right to stop a session early, tell the participant that that he or she will receive credit for participation, and ask him or her to leave.
- If a participant's behavior makes you uncomfortable before the session begins, you have the right to deny them participation and cancel the session before it starts. Likewise, if a participant appears to be under the influence, please cancel the session. Have them contact me if they have questions regarding credit.

Lab Duties and Responsibilities

Scheduling: You are required to designate 3 hours a week to run participants. Your schedule should be fairly consistent from week to week. If you have a conflict that emerges part way through the semester that impacts your running time, let me know and I will alter your hours.

Sometimes, it may be necessary to switch running times with a lab-mate for a session. Please let me know if you've switched with someone else for the week. Try to keep switching down to a minimum, and make sure that arrangements are made as far in advance as possible.

Running sessions: When you run an in-person session, you are responsible for a few different components of the session:

- 1) Checking on sona systems: Make sure that you check sona systems to see whether you have a participant, and what the participant's name is. Participants can sign up for sessions up until 2 hours before their session begins, so I would **strongly** recommend coming to the lab at the designated session time to double-check whether your session has filled.
- 2) Set-up: Make sure you're in the room 10 minutes before a session begins in order to set up the materials properly, determine which condition the participant is in and prepare accordingly, and assess whether there are enough copies of all research materials (two informed consent forms for each participant, permission to use data forms, questionnaire packets) for your session. That way, any technical difficulties/shortages of materials can be dealt with in plenty of time.
- 3) Keeping an eye out for participants: Check when you arrive and before the session begins to see if participants are waiting. If there are a group of people waiting in the hall, you can call out the participant's name to see if he or she is one of the people waiting. If you see a participant waiting before the session is due to begin, you can inform them that they are waiting in the appropriate place, and that you will be ready to start the session soon. If the participant has gotten into the 1-63 rooms before the session, tell them to wait in the outside hall until you are ready.
- 4) Running the session: The key to running a good experimental session is consistency. Make sure you go through all of the steps listed on the script, and that you've covered the most important points (informed consent form, debriefing, permission to use data form).
- 5) Data coding: Once a session is done, it is **very** important to check off the condition from the designated list so that the next session runs with the appropriate condition and does not have a repeat. Likewise, it is also important to code the data with the appropriate number and letter designations so that the data can be matched to the appropriate condition number.
- 6) Data storage: Make sure that informed consent and permission to use data forms are stored in a separate folder from the data.
- 7) Giving the participant credit: As soon as the session is complete, you are responsible for updating the participant credit. This is best dealt with sooner rather than later, and I would very much like for Dr. X to not have to send any e-mail reminders to me about updating credit.
- 8) No-Show participant: If the participant is a no-show, designate it in sona and e-mail me to let me know what has happened.
- 9) Check copies of all research materials for the next session: Make sure that the next session has enough copies. If it does not, e-mail me.
- 10) Data entry: if there is any data to be entered and you have a no-show or remaining time in your session, please enter data during that time and put the entered data in the designated folder.

Timeliness: Give participants a 5 minute "window" to show up for an experiment. I would prefer we run sessions rather than turn away participants, but it is important to both reinforce promptness as well as finish sessions in the time indicated on sona. If a participant shows up too late to be able to complete the session on time, you cannot run the session. If a session is run with more than one participant, once you have waited for five minutes and have started giving directions, the session is officially closed to participants and any latecomers cannot join the session. Tell any late participants that you've turned away to e-mail me, and I will handle their credit hours/rescheduling.

Appearance: I expect that you will be dressed appropriately for your designated sessions. I do not expect that you will be wearing professional outfits for your sessions, but keep in mind that

you are representing this lab. To that end, you should not wear overly revealing clothing, and should not use excessive perfume or cologne. Use common sense, and think about whether your appearance would distract participants unnecessarily. When you represent our lab in research talks or presentations, I expect your appearance to be business-casual and professional.

Computer sessions: Some sessions have computer-based components to them (i.e. medialab). There are extra considerations with computer-based research.

- 1) The computer may require additional time to start and set up. Make sure you have enough time to get the computer program running before the session begins.
- 2) Make sure that you enter in the proper condition as designated on the conditions sheet
- 3) When entering the participant number, make sure that it matches the conditions sheet
- 4) Check off the condition from the conditions sheet once you're done
- 5) Make sure that any coding of paper data matches the information entered into the computer.
- 6) If any technical difficulties happen during the session, you may have to restart the computer or move to another computer and begin the session again. In that case, make sure that the new session number is marked on the conditions sheet.
- 7) If you are unable to finish the session due to technical difficulties, make sure the participant is properly debriefed, and we will use whatever data has been collected.

Online sessions: Likewise, with online sessions, there are certain things to keep track of.

- 1) Make sure participants are given credit.
- 2) If the online sessions have conditions, make sure the conditions are posted in the appropriate order and check off the condition from the conditions sheet.

APPENDIX H: PROFESSIONAL SKILLS CHECKLIST

Common Rating Items for Recommendation Letters

Department of Psychological Science

The items below reflect common student traits faculty members are requested to assess when completing graduate recommendations. This form is not an indication that the faculty member will write you a letter of recommendation. Please officially request letters of recommendation in person.

Instructions: Please rate yourself on the items based on how you think *the faculty member* would rate you. Do not base your ratings on how you see yourself.

Category	Upper 5%	Upper 10%	Upper 25%	Upper 50%	Lower 50%	No Basis to Judge
Intellectual Ability						
Oral Expression						
Written Expression						
Motivation/ Initiative						
Cooperation						
Emotional Maturity						
Professional Appearance						
Organization						
Dependability						
Creativity						
Open-Mindedness						
Flexibility						
Ability to Reason						
Ability to Work with Others						
Ability to Work Independently						
Attendance/ Promptness						
Meets assignment deadlines with quality work						

Category	Upper 5%	Upper 10%	Upper 25%	Upper 50%	Lower 50%	No Basis to Judge
Maturity						
Accepts constructive feedback about performance						
Positive Attitude						
Honesty						
Leadership						
Mathematical/Logical Thought						
Time Management						
Potential as Teacher						
Potential as Researcher						
Overall Potential						

APPENDIX I: GRADUATE SCHOOL MENTORING CHECKLIST

Field of Study: _____

Type of Mentorship: Traditional/Group (Name of Group) _____

Career Planning:

Graduate School Counseling:

- ✓ Appropriateness
- ✓ Quality of Program
- ✓ Scholarships
- ✓ Employment Opportunities
- ✓ Cultural identity of the city/ town
- ✓ Crime rate
- ✓ Access to things of Importance...Churches, Schools, Theatres, and Other Colleges
- ✓ Region
- ✓ Proximity to family
- ✓ Urban/ Rural Setting
- ✓ Transportation Access/ Ease

Academics: GPA

Schedule (Term, Year)

Suggested List of Classes:

Improvements?

Resume (Attach a copy of applicable)

Notes?

Testing:

Test: _____

Date of Dry Run _____ : Score _____

Date of Dry Run 2 _____ : Score _____

Date of Dry Run 3 _____ :Score _____

Suggestions for Course of Study:

Personalized Study Plan:

Study Group:

APPENDIX J: LETTER OF RECOMMENDATION FORM

Complete this form if you want to request letters of recommendation for graduate school or for a job position from psychological science faculty. Return this form to the department secretary, Note: Speak with your individual letter writers about envelope and stamp needs.

Section 1 – Please type

Name:

Permanent phone number:	Today's Date:	Expected Graduation Date:
--------------------------------	----------------------	----------------------------------

Campus Email:

Personal Email:

Faculty Advisor:

1st Major:	2nd Major:
------------------------------	------------------------------

1st Minor:	2nd Minor:
------------------------------	------------------------------

Name of Letter Writer	Courses you have taken with them	Semester taken	Grade	How long they have known you
1.				
2.				
3.				

Section 2

Check one:

- I waive my right to review a copy of this letter at any time in the future.
- I do not waive my right to review a copy of this letter at any time in the future.

- I asked all of my designated letter writers to write me a letter of recommendation.
- All my designated letter writers have agreed to write me a letter of recommendation.
- I understand that a letter writer may ask me for additional information.
- I am submitting this form 3 weeks prior to my first letter of recommendation deadline.
- I give my permission to the designated letter writers listed on this form to write a letter of recommendation to the schools to which I am applying. Each letter writer has my permission to include data from my academic record, including but not limited to class grades and GPA, in this letter.

I have read and understand all the statements above. I also understand that it is in my best interest to have a faculty mentor assist me in the application process.

Student Signature

Date

Adapted from Georgia College Department of Psychological Science

Section 3 -- Please Type. For each school you are applying to, type the following information:

Institution Name and Full Mailing Address for Your Letter (even if letter is to be emailed):

--

Program or Work Contact Person(s) with Their Title:

--

Exact Name of Program or Job Position:

--

Degree, if applicable (Circle)	PhD MSW PsyD MFT EdD EdS MS JD MA MD MEd. MDiv Other: _____
---------------------------------------	---

Application deadline:

Additional forms required? (Circle) Yes No

Letter instructions (snail mail, e-mail, online):

--

Adapted from Georgia College Department of Psychological Science

APPENDIX K: INTERVIEW CAMPUS GUIDELINES



CASUAL

PROFESSIONAL



Common nonverbal mistakes made at a job interview

From a survey of 2000 bosses

21% —
Playing with **hair** or touching face

47% —
Having little or **no knowledge** of the company is the most **common mistake** job seekers make during interviews

Failure to make **eye contact** **67%**

Lack of smile **38%**

Bad posture **33%**

21% —
Crossing arms over their chest

9% —
Using too many **hand gestures**

Handshake that is too weak **26%**

33% —
Fidgeting too much

In a survey of 2000 bosses **33%** claimed that they know within the first **90 seconds** of an interview whether **they will hire someone**



The average length of an interview is **approximately 40 minutes**

Statistics show that when meeting new people the impact is:

7% From what we **actually say**

38% The quality of our **voice grammar** and overall **confidence**

55% The **way we dress, act and walk** through the door

Clothes

Bright colors are a turnoff

70% Employers claiming they don't want applicants to be **fashionable or trendy**.

65% Of bosses said **clothes could** be the **deciding factor** between two similar candidates.

Other Useful Accessories:

- Comfortable shoes
- Consider a couple extra copies of your CV
- Copy of interview schedule and map of school/town
- Hidden sheet about program and faculty (and their research)
- Hidden sheet of talking points about your research/classroom/internship experiences
- Portfolio/bag with pen and blank sheets of paper for notes

Standard Interview Questions to Be Prepared For

What made you apply to this program?

They are trying to assess fit

- Answer truthfully
- Highlight your strengths and the qualities that make you a desirable candidate

What are some of your strengths and weaknesses?

They want to know that you are growth-minded and have taken time to self-reflect

- Do not give a BS answer for your weakness
- Outline your plan to work on your weakness and the steps you have taken so far to address it
- Avoid overly personal issues like illness, hardship, or substance abuse

What are your hobbies?

They want to make sure that you are not some workaholic who will alienate everyone and burn out

- Avoid anything sketchy or too fringe here

Can you tell me about your research?

- Be prepared to defend/explain the methodology and statistical procedures that you have used
- Brush up on the work you have done so far and how it relates to the work being done at that school

Stress Questions

Example: How many quarters you would have to stack to be as high as the Empire State building?

- Designed to see how you respond under pressure
- Stay cool, smile to yourself, and be glad you've already prepared for it

Other Common Questions

- Who has been your greatest mentor? Who has deeply impacted your life/professional goals?
- Why did you apply to this school?
- Why counseling / school counseling / experimental psychology?
- Why do you want to be a _____? (Hint: do not just say "I want to help people.")

Come up with various insightful questions to pose to different people, and take notes on their responses

- Questions for current graduate students
- Questions for program coordinator/ professors