

General Mentoring Resources

The following is a list of resources compiled by UROP that are on mentoring topics – to include defining what a mentor and mentoring undergraduates are, how to create boundaries, and tips from various mentors who have worked with undergraduates. They are available from the UROP library, GT Library, or on-line. UROP library materials can be checked out by coming to the UROP office. Please contact [UROP](#) for availability.

* **Advisor, Teacher, Role Model, Friend. On Being a Mentor to Students in Science and Engineering.** 6th ed. Washington, D.C.: National Academy Press, 2005.

This is a guide for those who are likely to be mentoring someone - whether it's students, post-docs, junior faculty, or grad students. It offers different ways to be a good mentor with examples for specific situations that may occur at the different levels of undergrad, grad student, post doc, and junior faculty. While some are obvious, some are not - which is what makes it a valuable book for mentors to review. The book is divided into chapters explaining the different roles that a mentor may have and how to tailor the mentor's behavior based on that particular function. For example, there are chapters on being a faculty advisor, acting as a career advisor, as a teacher of skills (of communication - written and verbal, informal, people, teamwork, etc) and finally as a role model. In the chapter on mentor as a career advisor, tips on writing letters of recommendation are presented. The resources section at the end of the book has several good mentoring references listed, arranged by topic. This is another great starting book for those who are just starting to be a mentor and who need a little more focused guidance on what the roles are of a mentor and how to apply them. While this short guide is published by the National Academies Press with a focus on being an effective mentor in science and engineering, it contains mentoring help that is applicable to all disciplines.

Available From: UROP Office

* Barnett, Jeffrey E. "**Mentoring, Boundaries, and Multiple Relationships: Opportunities and Challenges.**" Mentoring & Tutoring: Partnership in Learning Vol. 16 (2008): pp. 3-16.

Most students and early career professionals desire mentoring relationships. Mentors can provide numerous added benefits to their protégés beyond what they typically obtain from classroom and other formal training experiences. Yet, despite the many potential benefits of mentoring relationships, the very nature of successful mentoring relationships brings with it certain risks for participants. Issues of boundaries and multiple relationships must be understood and successfully navigated to help ensure that mentors' objectivity and judgment are not impaired and that protégés are not exploited or harmed. The concepts of boundaries, boundary crossings, boundary violations, and multiple relationships are explored in this article and applied in the context of mentoring relationships. Recommendations for successfully navigating the challenges they bring are made in the hope of helping to ensure productive and healthy mentoring relationships.

<http://www.library.gatech.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=28389329&site=ehost-live>

* Bouguillon, Edward A, Sosik, John J, and Lee, Doris. "'It's Only a Phase': Examining Trust, Identification and Mentoring Functions Received across the Mentoring Phases." Mentoring & Tutoring: Partnership in Learning Vol. 13 Iss. 2 (2005): pp. 239-258.

Kram has proposed that mentoring relationships develop and mature over time, providing different levels of mentoring functions as they progress through a sequence of four distinct phases: initiation, cultivation, separation, and redefinition. However, the influence of these mentoring phases on the dynamics and functions of mentoring has received little research attention. This quantitative field study examined the effect of mentoring phases on protégés' perception of trust and identification with their mentors and mentoring functions received using data from 88 working professionals from industry and education. Results of MANCOVA indicated that protégés in the redefinition phase reported higher levels of psychosocial support than other protégés, and protégés in the separation phase reported lower levels of career development and role modeling than other protégés. No significant differences across the

mentoring phases were found for trust and identification among protégés towards their mentors; however, protégés from education reported lower levels of identification with their mentors than those from industry.

<http://www.library.gatech.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=17132600&site=ehost-live>

* Craig, Norman C. "**The Joys and Trials of Doing Research with Undergraduates.**" Journal of Chemical Education Vol. 76 Iss. 5 (1999): pp. 595-598.

Practical advice is given for doing research with undergraduates based on forty years of experience. This advice is illustrated with examples from the author's work and organized under a number of headings: seize the summers, prefer and enjoy the laboratory, insist on well-written reports, carve out niches, seek first-class instrumentation, welcome professional cooperation, avoid the Nobel Prize syndrome, damn the loose ends- full speed ahead, express enthusiasm, and honor your students. A chemistry professor expresses what he has found to be the benefits and trials of working with undergraduate researchers based on his 41 years of mentoring and guiding undergraduate researchers. Despite being written for a chemistry education journal, his words of wisdom will resonate with all mentors regardless of field. Some of his suggestions that he expounds on are the need for expressing enthusiasm and honoring your student researchers, avoiding the "Nobel Prize Syndrome", insisting upon well-written reports from your undergraduates, and find significant niches that student researchers will be able to contribute to significantly.

<http://jchemed.chem.wisc.edu.www.library.gatech.edu:2048/Journal/Issues/1999/May/abs595.html>

* Cramer, Robert J., and Prentice-Dunn, Steven. "**Caring for the Whole Person: Guidelines for Advancing Undergraduate Mentorship**" College Student Journal Vol. 41 (2007): pp. 771-778.

Most commentaries and empirical investigations on mentorship have focused on academic and professional outcomes to date. Drawing on literature from various areas of mentorship, we propose an approach of effective mentorship based on caring and compassion for personal aspects of young adult mentees. As such, we outline characteristics of a successful mentor for undergraduates and provide suggestions for hiring considerations and research.

<http://www.library.gatech.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=28351173&site=ehost-live>

* Desai, Ketaki V., et al. "**Integrating Research and Education at Research-Extensive Universities with Research-Intensive Communities.**" Advances in Physiology Education Vol. 32 Iss. 2 (2008): pp. 136-141.

Although the Boyer Commission (1998) lamented the lack of research opportunities for all undergraduates at research-extensive universities, it did not provide a feasible solution consistent with the mandate for faculty to maintain sustainable physiology research programs. The costs associated with one-on-one mentoring, and the lack of a sufficient number of faculty members to give intensive attention to undergraduate researchers, make one-on-one mentoring impractical. We therefore developed and implemented the "research-intensive community" model with the aim of aligning diverse goals of participants while simultaneously optimizing research productivity. The fundamental organizational unit is a team consisting of one graduate student and three undergraduates from different majors, supervised by a faculty member. Undergraduate workshops, Graduate Leadership Forums, and computer-mediated communication provide an infrastructure to optimize programmatic efficiency and sustain a multilevel, interdisciplinary community of scholars dedicated to research. While the model radically increases the number of undergraduates that can be supported by a single faculty member, the inherent resilience and scalability of the resulting complex adaptive system enables a research-intensive community program to evolve and grow.

<http://advan.physiology.org/cgi/reprint/32/2/136>

* Dotterer, Ronald L. "**Student-Faculty Collaborations, Undergraduate Research, and Collaboration as an Administrative Model.**" New Directions for Teaching and Learning Vol. 2002 Iss. 90 (2002): pp. 81-90.

Collaborative inquiry-based education (undergraduate research, scholarship, and creative activity) and collaborative administrative models are this chapter's topics. Both mentoring undergraduate research projects and collaborative administrative action point to new ways of incorporating research and learning into a single integrated process.

<http://www3.interscience.wiley.com.www.library.gatech.edu:2048/cgi-bin/fulltext/95015918/PDFSTART>

* Enerson, Diane M. "**Mentoring as Metaphor: An Opportunity for Innovation and Renewal.**" New Directions for Teaching and Learning Vol. 2001 Iss. 85 (2001): pp. 7-13.

Mentoring can be a useful metaphor for teaching because it derives its reference from the academy and focuses more on the learner and positive outcomes. Examining teaching within this context allows for a different analysis of teaching and the learning process and provides the opportunity for both renewal and change.

<http://www3.interscience.wiley.com.www.library.gatech.edu:2048/journal/89016483/issue>

* Garvey, Bob, and Alred, Geof. "**Educating Mentors.**" Mentoring & Tutoring: Partnership in Learning Vol. 8 Iss. 2 (2000): pp. 113-126.

Mentoring is widely recognized as a helpful approach to professional development and as such has become more prevalent in a range of organizations in recent times. It is also recognized that for mentor schemes to develop mentors need some sort of development activity themselves. This article, based on a survey in higher education attempts to address mentor education.

<http://www.library.gatech.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=3958290&site=ehost-live>

* Gonzalez, Cristina. "**Undergraduate Research, Graduate Mentoring, and the University's Mission.**" Science Vol. 293 Iss. 5535 (2001): pp. 1624-1626.

Undergraduate research and graduate mentoring have received a great deal of attention in recent times. What do these activities have in common? They both speak to the primary mission of the research university, which is not merely carrying out research but training students to do research. The knowledge-based global economy, with its wealth of information and opportunities, has increased undergraduate students' need for research skills as well as graduate students' desire for personal guidance. As the research university matures, the boundaries between graduate and undergraduate education are blurring. Indeed, if we focus on the learning process, we find not two but five levels of learning at the research university: lower division, upper division, master's, doctoral, and postdoctoral. All five levels form a continuum, a series of gradual steps. The mission of the university is to introduce students to research and to inspire in them a passion for discovery at each of these levels.

<http://www.sciencemaq.org.www.library.gatech.edu:2048/cgi/citmgr?gca=sci;293/5535/1624>

* Handelsman, Jo, et al. **Entering Mentoring: A Seminar to Train a New Generation of Scientists.** First (paperback edition) ed: Itchy Cat Press (paperback edition), 2005.

This seminar and curriculum maintains the belief that effective mentoring can be learned, but not taught. Good mentors discover their own objectives, methods, and style by mentoring. Most faculty learn to mentor by experimenting and analyzing success and failure. The goal of the seminar outlined in this curriculum is to accelerate the process of learning to be a mentor. The seminar provides mentors with an intellectual framework to guide them, an opportunity to experiment with various methods, and a forum in which to solve mentoring dilemmas with the help of

their peers. Discussing mentoring issues during the seminar provides every mentor with experiences of working with diverse students, tackling a range of mentoring challenges, and considering a myriad of possible solutions. UROP encourages working through this curriculum either individually or through the formation of groups.

Available From: UROP Office, Online

www.hhmi.org/grants/pdf/labmanagement/entering_mentoring.pdf

* Kanigel, Robert. **Apprentice to Genius : The Making of a Scientific Dynasty**. Johns Hopkins pbk. ed. Baltimore: Johns Hopkins University Press, 1993.

This book tells the stories of how one strong mentor can further influence the behaviors and scientific lives of several generations of world famous and successful researchers. Specifically, this book details the lives of a set of biomedical researchers, beginning with James Shannon to Bernard Brodie, who had employed Julius Axelrod (Nobel Prize), who was mentor to Solomon Snyder (Lasker Prize), who mentored Candace Pert. The interwoven stories of how each of these people came to work together or be linked together in a 'genealogy' show the more human messy side of scientific research. This is a very interesting book to read, especially from a historical perspective. It is very well written with a flow to the story that makes it difficult to put down and very understandable to those not in the biomedical research field. While these stories show the reality of working in different labs - the politics, the fight for research credits, how mentoring relationships can change and evolve and end (sometimes dramatically), it also emphasizes the importance of mentoring and encouraging the next generation of researchers.

Available From: UROP Office

* Merkel, Carolyn A., and Baker, Shenda M. **How to Mentor Undergraduate Research**. Washington, DC: Council on Undergraduate Research (CUR), 2002.

This booklet from the Council on Undergraduate Research (CUR) offers a brief, but thorough, overview of mentoring undergraduate student research. This is a great first resource to look at when getting started with undergraduate researchers. Some of the topics discussed are expectations of the student and what the mentors should expect from their students. In addition, the basic tenets of undergraduate research mentoring are discussed - the value of undergraduate research, the differences between summer and school year research, and what mentoring should involve. Finally, there are practical bullet-point guides to make introducing your UG student to your and his/her research project and research group.

Available From: UROP Office

* Mock, Kenrick, and Murphy, Eric S, eds. **Mentoring Undergraduates in Research and Scholarship Faculty Handbook**. Anchorage, AK: University Honors College and Office of Undergraduate Research and Scholarship, University of Alaska Anchorage, 2008.

This handbook is valuable as a resource for GT mentors to get another perspective of mentoring undergraduate research - both within and outside of their individual discipline. The mentor-authors write about problems and the solutions to those problems that they have encountered - many of which are applicable to Georgia Tech students. From the editors: This handbook is intended as guidance for mentoring undergraduates in research and scholarship at UAA. To get a broad picture of how undergraduate researchers are mentored at UAA, we solicited and received essays from twenty-one faculty members across different disciplines, schools, and colleges. We would like to thank all of these faculty members for volunteering their time to make this handbook possible. The following collection of essays represents a concerted effort by UAA faculty members who truly believe in UAA's mission to "discover and disseminate knowledge through teaching, research, engagement, and creative expression." These essays are as diverse as the faculty who wrote them. A common thread, however, is each faculty member's commitment to mentoring their students in research and scholarship. Several faculty describe how rewarding it is to see their students grow in maturity, confidence, and expertise as they engage in research. We invite you to explore the rewards that come from close interaction with intelligent and stimulating students.

- * Plummer, Ben. "**The Senior Scientist as a Resource for Mentoring Undergraduate Research.**" Council on Undergraduate Research Quarterly Vol. 22 Iss. 2 (2001): pp. 74-75.

The author is a recipient of the Camille and Henry Dreyfus Foundation Senior Scientist Mentors grant. The author's experiences mentoring undergraduates in science research is briefly described, from how students find out about faculty and projects to final results of the students' work (ie publication of journal article).

Available From: UROP Office

- * Rhodes, Danny L. "**Does Mentoring Really Work for College Students?**" Allied Academies International Conference. Proceedings of the Academy of Educational Leadership.

There is a lack of research on whether mentoring will help undergraduate college students prepare for the professional world. Only about half of college attendees graduate and many are ill-prepared for professional careers. The Personal Skills Map, a comprehensive assessment tool that identifies emotional intelligence, was administered to 152 freshmen and 58 sophomores in a non-equivalent control group design. The freshmen participated in a mentoring program; sophomores did not. Both groups were administered the Personal Skills Map later as seniors. The results showed that mentoring had a positive effect on academic development, social development, and retention, but had no impact on cognitive development. The findings suggest that other colleges and universities should consider implementing mentoring programs.

<http://www.alliedacademies.org/Public/Proceedings/RenoProceedingsFall2008.pdf#page=146>

- * Roberts, Andy. "**Mentoring Revisited: A Phenomenological Reading of the Literature.**" Mentoring & Tutoring: Partnership in Learning Vol. 8 Iss. 2 (2000): pp. 145-170.

This paper details the outcomes of an exploration to describe what the mentoring concept is and how it may best be communicated. The rationale is twofold: firstly, on a personal level, despite being a mentor and researching mentoring for several years, I still found describing and sharing explanations of mentoring with others difficult to achieve with any degree of consensus. Without such a consensus, how may we ever know that we are talking about the same thing? Secondly, my own confidence in what mentoring may be was affected by discovering that the claimed origins of the very term were erroneous. As a consequence, a phenomenological reduction - whereby the inquirer 'brackets' any suppositions and previously thought knowledge prior to exploration - was deployed in order to review a sample of mentoring research and debate covering a time period 1978 - 1999 across several disciplines. Mentoring appears to have the essential attributes of: a process; a supportive relationship; a helping process; a teaching-learning process; a reflective process; a career development process; a formalized process; and a role constructed by or for a mentor. The contingent attributes of the mentoring phenomenon appear as: coaching; sponsoring; role modeling; assessing; and an informal process. In addition, the consequences of the concept were explored, and a lexical definition of mentoring offered. This paper concludes that if we are ever to address the question, 'if we do not agree on what mentoring is, how do we know if we are talking about the same thing?' then attention to and exploration and discussion of our perceptions of the concept may be a suitable starting point.

<http://www.library.gatech.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=3958287&site=ehost-live>

- * Schultz, Jeffery R. "**The Transformational Process of Mentoring.**" Council on Undergraduate Research Quarterly Vol. 22 Iss. 2 (2001): pp. 72-73.

Good and effective mentoring can be distilled to be a transformational process that is personalized, intentional, organized, and assessable.

- * Shellito, Cindy, et al. "**Successful Mentoring of Undergraduate Researchers.**" Journal of College Science Teaching Vol. 30 Iss. 7 (2001): pp. 460-464.

Prompted by the growing presence of undergraduates in research laboratories and the increased number of programs that encourage undergraduates to pursue research, the authors conducted a survey of undergraduate researchers at the University of California, Davis, to determine what faculty can do to become better mentors to these students.

<http://proquest.umi.com.www.library.gatech.edu:2048/pgdlink?index=14&did=73065042&SrchMode=3&sid=1&Fmt=6&VInst=PROD&VType=PQD&RQT=309&VName=PQD&TS=1253762623&clie ntlid=30287&aid=1>

- * Singer, J. **How to Mentor Undergraduates: A Workshop Sponsored by the Buffalo State College Office of Undergraduate Research (UGR) and the UGR Advisory Committee.** Buffalo, NY, 2005.

Good broad overview of mentoring, from expectations to setting goals, in a PowerPoint presentation.

Available From: UROP Office

- * Stamatoplos, Anthony. "**An Annotated Bibliography of Faculty Mentoring of Undergraduate Research.**" Council on Undergraduate Research Quarterly Vol. 26 Iss. 2 (2005): pp. 84-89.

This is an annotated bibliography of faculty mentoring of undergraduate research articles and publications. UROP or Georgia Tech has the majority of these and are included throughout these resource lists.

Available From: UROP Office

- * Wadkins, Theresa, and Miller, Richard L. "**Bending Twigs: The Act of Mentoring Undergraduate Student Research.**" Developing, Promoting, & Sustaining the Undergraduate Research Experience in Psychology. Eds. Richard L. Miller, et al. Syracuse, NY: Society for the Teaching of Psychology, 2008. 209-214.

This is an article that briefly covers important mentoring topics that typically new mentors struggle with. Topics include important mentor characteristics, expectations of the mentor and the student, and various challenges of mentoring: selecting students, managing efforts, choosing research topics, research ethics, and handling disappointment. While published in a psychology journal, this article is relevant for all faculty mentors in all research disciplines.

<http://teachpsych.org/resources/e-books/ur2008/5-1%20Wadkins%20%20Miller.pdf>

- * Whiteside, Ursula, et al. "**Initial Suggestions for Supervising and Mentoring Undergraduate Research Assistants at Large Research Universities.**" International Journal of Teaching and Learning in Higher Education Vol. 19 Iss. 3 (2007): pp. 325 - 330.

This article specifically addresses undergraduate students attending large research universities who often have the opportunity to participate in the design, conduct, analysis, and dissemination of research initiated by faculty, postdoctoral fellows, and graduate students. To date, guidelines for the conduct of this specific type of relationship – that of an academic researcher to an undergraduate research volunteer in a large team based research laboratory – remain absent from the peer-reviewed education literature. Included in this article are specific suggestions for success in facilitating this relationship within the context of a large, research-oriented university department.

<http://www.isetl.org/ijtlhe/pdf/IJTLHE280.pdf>