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# Student Success: A Literature Review of Faculty to Undergraduate Mentoring

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## Abstract

This review summarizes the literature on university faculty to student mentoring programs. There has been a proliferation of mentoring programs because of the perceived benefit to student persistence and retention. While mentoring programs have become common, the research on these programs has not kept pace. Shortcomings identified thirty years ago, such as lack of theoretical guidance, lack of operational definition of mentoring, and poor design continue to plague mentoring research. Recommendations to address these shortcomings and improve internal and external validity are examined. As universities continue to have increasingly constrained resources and pressure to demonstrate strategies to help students be successful, evidence-based research will be increasingly desired. If shortcomings in mentoring research can be addressed, mentoring programs hold the potential to be part of a university's strategic plan to help students be successful.

Keywords: mentoring, student success, faculty to student mentoring

In higher education, student success measures have been studied from many angles for the past 40 years (Bergerson, Hotchkins, & Furse, 2014; Swail, Redd, & Perna, 2003). Studies on attrition estimate that between 40 and 50% of students leave college before graduation (Tinto, 1993; Wirt, Choy, Rooney, Provasnik, Sen, & Tobin, 2000; Shapiro, Dundar, Huie, Wakhungu, Bhimdiwala, & Wilson 2018). Attrition rates are even higher for first-generation students (McFarland, 2017; Ross, 2012). Minority students are particularly at risk, with only 34% of African American and 46% of Hispanic students graduating with a bachelor's degree within six years of being admitted to a four-year institution (Ross, Kena, Rathbun, Kewal-Ramani, Zhang, Kristapovich, Manning, 2012).

In response to the large number of students who fail to persist to graduation, colleges and universities have established mentoring programs to aid in student success. There is great variation in the structure of mentoring programs, such as who does the mentoring (e.g., faculty, peers, alumni), level of training for mentors (e.g., formal, informal), theoretical

framework (e.g., framework conceptualized or not), targeted population (e.g., general, first-generation, women, minorities, nursing students), and sophistication of research design (e.g., utilization of comparison group) (Shapiro & Blom-Hoffman, 2004; Gershenfeld, 2014; Castellanos, Gloria, Besson, and Harvey, 2016). Regardless of the structure, increasing student persistence as a measurement of student success is the underlying goal of most mentoring programs.

As universities come under increasing scrutiny regarding successfully educating students and preparing them for careers, it is imperative the programs designed to help students—such as mentoring programs—be carefully planned, structured, and assessed. If a mentoring program is not grounded in a substantive theoretical framework, or lacks sophistication in design and assessment, the university is simply throwing money at a problem without knowing if it is clearly impacting student success.

The purpose of this manuscript is to study and update previous literature reviews in order to identify past and current issues that, if properly addressed, will help university administrators, faculty, institutional researchers, and student affairs personnel with the planning, structure, and assessment of university mentoring programs. It begins by reviewing previously published literature to gain an understanding of issues facing mentoring programs, as well as to give context to the variety of information that such research, up to now, has established about those programs. Second, models of mentoring, as identified by the literature, are explained and explored. Third, theoretical frameworks (or lack thereof) guiding the research on mentoring are examined. Fourth, this article synthesizes the aforementioned literature reviews to conventionalize a functional definition of mentoring. Fifth, best practices in mentoring are identified. Limitations of the research in the field are discussed throughout this review. Finally, a discussion for future research is presented.

## Review of Mentoring Literature

Since 1991, there have been three well-known comprehensive literature reviews conducted regarding university mentoring programs. Maryann Jacobi (1991) conducted the first review of the literature on mentoring and undergraduate academic success. Regarding the questions: “Does mentoring help students succeed in college? If so, how?” Jacobi studied more than 100 articles and found both the theoretical and empirical answers to be lacking. Most of the studies dated from the mid-1970s to the early 1990s and provided descriptions of the mentoring programs designed to promote academic success, but substantially fewer systematic evaluations of these programs. Programs that did provide evaluation data often had methodological problems that limited both internal and external validity. Jacobi (1991)

summarized her literature review by recommending that future studies: (1) include more descriptive data, such as the number of students per mentor; (2) provide more rigorous quasi-experimental research design; (3) evaluate the effectiveness of formal mentoring programs; (4) better understand the dynamics and development of mentoring relationships; and (5) link theory to academic outcomes.

The second review by Crisp and Cruz (2009) examined 42 empirical studies from 1990 through 2007. They found over 50 definitions of mentoring, with minimal definitional consistency across studies. Though Crisp and Cruz found little agreement about the definition of mentoring, they did find traits of mentoring that were reinforced by the literature such as: (1) effective mentoring relationships focus on the growth and accomplishment of an individual; (2) effective mentoring includes broad forms of support, such as assistance with professional and career development, role modeling, and psychological support; and (3) effective mentoring relationships are personal and reciprocal.

Of the studies Crisp and Cruz (2009) examined, only 19 were quantitative, and most used non-experimental methods. Only five studies (Campbell and Campbell, 1997; Kahveci, Southerland, & Gilmer, 2006; Rodger and Tremblay, 2003; Salinitri, 2005; Sorrentino, 2007) used an experimental or quasi-experimental design. Just as in the Jacobi (1991) review, those studies reviewed by Crisp and Cruz (2009) continued to be plagued by methodological issues, including lack of an operational definition of mentoring specific enough for replication, failure to test or report the validity of survey items, reliance of self-reported benefits of mentoring as outcome measures, only one-time point in data collection, over-reliance of descriptive methods as the main analysis, lack of demonstrating how the sample was representative of study population, and failure to utilize a comparison group. Their greatest concern, however, continued to be the absence of theory guiding the mentoring process.

Crisp and Cruz (2009) identified the Campbell and Campbell (1997) study as the most methodologically rigorous. Using an experimental design to investigate the effects of mentoring on minority students' grade point averages and retention rates, Campbell and Campbell found that minority students who received faculty mentoring had a significantly higher GPA and were twice as likely to persist as non-mentored minority students ( $p < .001$ ).

The third and most recent review by Susan Gershenfeld (2014) looked at more than 50 articles that specifically focused on university mentoring programs and found limited overall academic progress made on key shortcomings, such as an operational definition of mentoring and weak research designs identified by two previous reviews (Crisp & Cruz, 2009; Jacobi, 1991). The one area where she did find substantive progress was in the use of theory, with 70% of the studies being guided by a theory or conceptual framework. This more recent literature review by Gershenfeld identified 11 different theories used. Tinto's (1987, 1993)

social integration theory was used most often. According to Tinto, students who were integrated into the campus culture both within and outside of the classroom are more apt to persist and graduate.

While theoretical progress has been made since 2009, the same cannot be said for methodological rigor. Threats to external validity, such as small sample sizes, single geographical location, and narrowly focused programs, have limited generalizability. While Gershenfeld (2014) continued to identify methodological limitations, she did make a significant contribution to the field of mentoring by applying the Levels of Evidence-Based Intervention Effectiveness (LEBIE) developed by Jackson (2009) to assess methodological rigor for evidence-based practice. LEBIE includes five levels: Level 1 = Superior; Level 2 = Effective, Level 3 = Efficacious, Level 4 = Emerging, and Level 5 = Concerning. None of the studies reviewed by Gershenfeld (2014) qualified for the two highest levels because none used an experimental design. Five studies qualified for Level 3 by using a nonrandomized control or a comparison group. Four studies met Level 4 requirements. Most studies, 11, received the lowest classification of Level 5. These Level 5 studies only collected data at one point in time on mentees and/or mentors, with no comparison group. In summary, most studies reviewed by Gershenfeld (2014) continue to have the same methodological concerns as those noted by Crisp & Cruz (2009) and by Jacobi (1991). While each of the studies Gershenfeld reviewed reported some positive effects of mentoring, because of the methodological limitations identified, the reports on the positive impacts of mentoring need to be viewed with caution.

In addition to the level system using LEBIE, Gershenfeld made another significant contribution in her review by identifying the dependent variables for each study. Of these studies reviewed, 60% (n=12) used more subjective measures, whereas the other 40% used more objective measures. In some cases, the subjective measures were used as proxy measures for predicting academic and other outcomes.

The third and final contribution from Gershenfeld (2014) was a description of the operational features of each study, such as number of students who had access to mentors, nature of mentor/mentee relationship, mentor-mentee ratio, volunteer status, financial compensation, frequency of meetings, duration of mentor/mentee relationship, training resources for mentor, and ongoing supervision of mentor.

## Models of Mentoring

Just as definitions of mentoring vary in their scope and meaning, so do the models of mentoring. Mentoring includes models such as academic, psychosocial, research (graduate and undergraduate), career development, and role model (Thiry & Laursen, 2011; DeAngelo,

Mason, & Winters, 2016; Crisp, Baker, Griffin, Lunsford, & Pifer, 2017). While there are many models to evaluate, this review will focus on academic, psychosocial, and research mentoring.

### **Academic Model of Mentoring.**

Academic mentoring involves helping students improve grades, increase the number of credits completed, improve the persistence of students, and increase the retention rates in college programs (Campbell & Campbell, 1997; Sorrentino, 2007; Masehela & Mabika, 2017). According to Masehela & Mabika (2017), academic mentoring also involves a “mentor [that] is knowledgeable in a specific academic area of expertise and should share that knowledge and skills with their mentees” (p. 170).

Sorrentino (2007) evaluated a mentoring program called Search for Education, Elevation, and Knowledge (SEEK) to specifically look at the academic performance of at-risk university students. The results indicated that mentored at-risk students had higher GPA's and were less likely to be dismissed from school than non-mentored students. Masehela & Mabika (2017) found similar results in their evaluation of the mentoring program at the University of Venda.

### **Psychosocial Model of Mentoring.**

Mentoring is defined as more than just impacting the academic performance of students, but also assisting them with psychological and social issues that arise while they are in school (Masehela & Mabika, 2017). In higher education, “the word psychosocial is often viewed as students making preparations to adapt to campus life which entails social integration, well-being and self-confidence” (Ismail, Abdullah, Ridzwan, Ibrahim, & Ismail, 2015, p. 54). Livingstone & Naismith (2018) considered the psychosocial mentoring as more of a pastoral model that provided for a more open relationship in which academic and personal concerns could be discussed.

Phinney, Torres Campos, Padilla Kallemeyn, & Kim (2011) looked specifically at Latino students and focused on academic motivation, belonging, depression, obstacles, self-efficacy, stress, and support. The results indicated the mentees improved on self-efficacy, had less depression, and lower stress scores than their non-mentee counterparts. Ismail, et al. (2015) found that mentor programs do have an impact on mentees' psychosocial development and concluded, “Recent studies in university/faculty mentorship programs disclose that if mentors appropriately implement such mentorship practices this may have a positive impact on mentees outcomes, especially in psychosocial development” (p. 54). Livingstone and Naismith (2018) concurred with Ismail and found a strong correlation that reflected positively on pastoral mentoring models.

## Undergraduate Research Model of Mentoring.

In addition to academic and psychosocial models, the Undergraduate Research Experience (URE) mentoring model provides undergraduate students with research experiences under the guidance and direction of university faculty (Behar-Horenstein, Roberts, & Dix, 2010). According to Kardash (2000), URE mentoring models provide opportunities for students to learn and develop higher-order thinking skills, to integrate information across disciplines, and encourage students to set high standards. Thiry & Laursen (2011) also conclude that UREs provide professional socialization, intellectual support, and personal and emotional support for the students. Behar-Horenstein et. al. (2010) found that faculty and students felt that URE mentoring models promote intellectual and personal growth in the undergraduate researchers. Kardash (2000) found evidence that supports the idea that URE mentoring models have a positive impact on undergraduate research skills.

While the models vary widely, Anderson (1995) observed a positive relationship between undergraduate academic success and access to faculty mentoring. This conclusion is echoed in the academic community in the USA and other countries (Sharma, 2015; Aikens et al. 2016; Cornelius, Wood, & Lai, 2016). Regardless of the targeted population, type of university or location, mentoring programs have gained popularity on university campuses due to their perceived positive effects on persistence and retention.

## Theoretical Frameworks in Mentoring

The reviews by Jacobi (1991) and Crisp and Cruz (2009) identify the lack of theoretical or conceptual framework as a limitation in the field. Gershensfeld (2014) and Johnson, Rose, & Schlosser (2007) found that, while about 30% of studies were void of theoretical framework, many supported influential models for mentoring. There were improvements made from the first review by Jacobi (1991) to the Gershensfeld (2014) review, but few studies worked to link theory with methodology. Most studies simply gauged satisfaction of mentoring and called that sufficient. The most refined theoretical models of mentoring have rarely been researched. Table 1 provides a brief description of the theory or conceptual frameworks that were used in mentoring studies. While many of the frameworks are shown, Table 1 is by no means an exhaustive list. Because of the wide range of outcome measures that modern mentoring programs should include, Gershensfeld (2014) suggests that future mentoring programs use more than one theory or framework to guide the research.

**Table 1.** *Theory or Conceptual Frameworks of Mentoring*

Type	Description	Author(s)	Times Listed
<b>Kram's Mentor Function</b>	Identified the primary factors of emotional, instrumental and networking functions of the mentor/protégé relationship	Johnson, Rose, and Schlosser (2007)	1
<b>Student Approaches to Learning Paradigms</b>	Student peer mentoring as an intervention technique to help students improve understanding of different learning paradigms	Fox, Stevenson, Connelly, Duff, and Dunlop (2010)	1
<b>Social Capital and Social Networks</b>	The Gannon and Maher article indicates that social capital can be leveraged through mentoring programs using Alumni and Academics. Social capital being the relationships garnered through mentoring.	Gannon and Maher (2012) Morales (2010)	2
<b>Social Integration</b>	Hall and Jaugieitis recommend peer mentoring that focus on engagement to socially integrate 1st year students. Hu and Ma evaluated student persistence and the positive roles of mentors to students. Mekolichick and Gibbs studied the cultural capital advantages for first-generation college students in undergraduate research opportunities	Hall and Jaugieitis (2011) Hu and Ma (2010) Mekolichick and Gibbs (2012)	3
<b>Hunt and Michael's Model of Mentoring</b>	This comprehensive framework considers environmental factors, mentor characteristics, protégés' characteristics, duration, and outcomes.	Johnson, Rose, and Schlosser (2007)	1
<b>Capitalization</b>	Peer mentors participate in voluntary opportunities that provide growth and development	Holland, Major, and Orvis (2012)	1
<b>Cultural Capital</b>	Social class, as it relates to educational outcomes. Promotes some students and hinders others based on their social class.	Mekolichick and Gibbs (2012)	1
<b>Feminist and Network Models</b>	Networking women together as mentors and mentees to improve the climate for female undergraduate students	Putsche, Storrs, Lewis, and Haylett (2008)	1
<b>Passive versus Active Learning</b>	Mentors expected to just read the lesson (passive) versus mentors expected to teach the lesson after reading (active)	Amaral and Vala (2009)	1
<b>O'Neil and Wrightsman's Sources of Variance Theory</b>	The framework incorporates primary factors of mentorship looking at personality of both mentor and protégé, relationship parameters, characteristics, environment, activities, and diversity.	Johnson, Rose, and Schlosser (2007)	1



## Conceptualizing A Functional Definition of Mentoring

All three literature reviews previously discussed (Jacobi, 1991; Crisp & Cruz, 2009; Gershenfeld, 2014) identify the lack of a consistent mentoring definition as a limitation of research in the field. Jacobi provided 15 definitions of mentoring, while Crisp and Cruz identified 50 more. Mentoring definitions generally consist of a “who, what, and why” regarding mentoring. The “who” describes the mentor and mentee, the “what” are adjectives such as “guide and facilitate,” and the “why” is described with statements such as “positively socialized” or “strengthen student engagement.” Table 2 lists examples of mentoring definitions so as to highlight their disparate natures and illustrate why it is often difficult to differentiate mentoring from other types of student support.

**Table 2.** *Mentoring Definitions*

<b>Author</b>	<b>Definition</b>
Gallup, Inc. (2016, February 02).	Supportive relationships and experiential learning opportunities. (pg. 14).
Livingstone, N., & Naismith, N. (2018).	An experienced person (mentor) provides career and/or personal support to another individual (protégé).
Crisp, G., Baker, V. L., Griffin, K. A., Lunsford, L. G., & Pifer, M. J. (2017).	A relationship between two individuals, whereby the more experienced person is committed to providing developmental support to the other, less experienced person. (pg. 18).
McWilliams, A. (2017).	Building a purposeful and personal relationship in which a more experienced person (mentor) provides guidance, feedback, and wisdom to facilitate the growth and development of a less experienced person (mentee). One-to-one interactions that involve the delivery of guidance, feedback, and lessons learned. (pg. 70).
Cornelius, V., Wood, L., & Lai, J. (2016).	The process by which a student or mentee is positively socialized by a faculty member or mentor into the institution and/or profession. (pg. 193).
Gershenfeld, S. (2014).	Aim to strengthen student engagement and relationship building in order to improve academic performance and college retention. (P 365)
Allen, T. D., & Eby, L. T. (2010).	Mentoring relationships at this level typically focus on advising students in academic and career decisions. Psychosocial functions of undergraduate mentoring may be related more toward supporting a student in adjusting to life apart from home and making wise personal decisions. (p. 326-327)
Long, E. C. J., Fish, J., Kuhn, L., & Sowders, J. (2010).	Mentoring is an interdependent relationship; each person influencing and being influenced by the other. “Mentoring is a deep understanding and appreciation for the circumstances and unique abilities of a protégé that goes beyond the interest in any single personal dimension” (p. 12).
Crisp, G., & Cruz, I. (2009).	Mentoring is focused on the growth and accomplishments of an individual and may include several forms of assistance and broad forms of support (academic, professional, career); it is personal and reciprocal. (Pg. 527-528).

Johnson, W. B. (2002).	Mentoring is a personal relationship in which a more experienced (usually older) faculty member or professional acts as a guide, role model, teacher, and sponsor of a less experienced (usually younger) graduate student or junior professional. A mentor provides the protégé with knowledge, advice, challenge, counsel, and support in the protégé's pursuit of becoming a full member of a particular profession. (p. 88)
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The lack of conceptual agreement about the definition of mentoring is problematic to the field because it limits the ability to measure what is being offered and what constitutes a successful mentoring experience. Nora and Crisp (2007) made a significant contribution by focusing on the functions of mentoring rather than an operational definition.

Though Gershenfeld (2014) acknowledged the lack of definition agreement as problematic, she recognized that reaching consensus was futile and instead identified in her review the functional aspects of mentoring advanced by Nora and Crisp (2007). Nora and Crisp theoretically framed the underlying components that students identified as constituting a mentoring experience. Nora and Crisp identified four major domains or latent constructs from the mentoring literature:

- Psychological/emotional support: listening, providing moral support, identifying problems, and providing encouragement.
- Goal setting and career paths: assistance with setting academic/career goals and decision making.
- Academic subject knowledge support: acquisition of necessary skills and knowledge, educating, evaluating, and challenging mentee academically.
- Role model: the ability of mentee to learn from a mentor's present and past actions and achievements/failures.

Using factor analysis, Nora and Crisp (2007) substantiated the existence of three of the four latent constructs. Role modeling was not substantiated. In sum, mentees need mentors who create an emotional safety net by providing support and encouragement. Students need a mentor who helps the student self-appraise with feedback as the student explores their options and sets goals. Nora and Crisp (2007) made a substantial contribution to the mentoring field by providing a conceptual base to support the structure of future mentoring programs.

## Mentoring Best Practices

Campbell (2010) identified the following six best practices of university mentoring programs: (1) Formal Mentoring; (2) Recruiting and selecting mentors; (3) Matching mentor

and mentee; (4) Mentor training; (5) Appropriate boundaries; and (6) Frequency of interaction between mentor and mentee.

### **Formal Mentoring Programs.**

One factor that distinguishes formal vs. informal mentoring programs is the level of intentionality in the program. Formal mentoring programs involve carefully planned and intentional mentoring relationships; expectations of participants; third-party mindful matching; and university support for time, space, and activities (Anderson and Others, 1995; Cornelius, et. Al. 2016).

### **Recruiting and Selecting Mentors.**

Mentors should be selected for positive personality characteristics (self-awareness, warmth, empathy, integrity, and honesty) and behavioral characteristics (a history of mentoring, effective communication skills, availability, productivity, and respect of colleagues). Castellanos et al. (2016) reinforced this practice with their study of the mentor's role in assisting undergraduates with fitting into campus culture.

### **Matching Mentor and Mentee.**

The match between mentor and mentee is essential to the quality of the relationship. Facilitating a natural relationship, without forcing it, is best practice. Fassinger and Hensler-McGinnis (2005) provide a matching model for developers of mentoring programs. These activities help mentees seek the kind of mentor with whom they would like to work.

### **Mentor Training.**

Boyle and Boice (1998) describe a program where faculty members were mentored by each other in their current duties and roles during scheduled monthly meetings. Participants reported these monthly meetings as very helpful and supportive.

### **Appropriate Boundaries.**

Ingraham et al. (2018) discusses incivility as a barrier to “the development of positive and respectful relationships” (Pg. 18). The mentor needs to create a safe environment so that both mentor and mentee can communicate and clarify needs and expectations.

## **Frequency of Interaction.**

There is no consensus about the frequency and length of meetings between mentor and mentee. Campbell and Campbell (1997) found that over a year's time, mentees averaged 7.28 contacts with their mentors, with a total meeting time of 124 minutes. Campbell (2010) recommends that mentor/mentee meetings be scheduled at regular intervals.

## **Conclusions, Limitations, and Future Directions**

In conclusion, university established mentoring programs have become a common intervention for grappling with the high attrition and low graduation rates of students. While these mentoring programs have become popular, the research to determine their effectiveness has not kept pace. From the three reviews of Jacobi (1991), Crisp and Cruz (2009), and Gershenfeld (2014) and a meta-analysis of mentoring programs by Eby, Allen, Evans, NG, and DuBois (2008), we conclude that mentoring is significantly correlated with a wide variety of positive student outcomes, such as student behaviors, attitudes, and retention rates.

However, due to the three major limitations identified in this review (a lack of an operational mentoring definition, a lack of theoretical guidance, and poor research designs), we do not know if these positive correlations equate to casual effects. Until university mentoring programs address these limitations, universities will continue throwing money at the problem of high attrition and low graduation rates without really knowing if mentoring programs increase student success. We make four specific recommendations for future university mentoring programs. These recommendations will improve the planning and evaluation of future programs, as well as improve internal and external validity, thus making causal inferences more likely.

First, while the mentoring field has made strides in identifying theoretical frameworks used in mentoring programs (Gershenfeld, 2014), this continues to be a glaring shortcoming, because without theoretical links, the effects of mentoring on academic success simply cannot be explained. Describing theoretical links between mentoring and academic success is not just an intellectual exercise; it shifts the focus of what is being emphasized. In empirical studies, theory guides how the independent variable (in this case, mentoring) will be measured and the selection of dependent and mediating variables. Jacobi (1991) cautioned that when models or frameworks remain implicant, mentoring programs may be inadequately developed. We suggest using the principles of logic modeling and "if-then" statements to link theoretical frameworks with variables of interest and how these variables will be measured. We echo Gershenfeld's (2014) recommendation that future mentoring programs use more than one

theory or framework to guide research on mentoring because of the wide range of outcomes measured in modern programs.

Second, it is unlikely that the field of mentoring will ever reach a consensus of what constitutes an operational definition of mentoring. We suggest that research on mentoring can move forward using a functional definition of mentoring clarified by the work of Nora and Crisp (2007). Using this functional definition of mentoring, we propose that mentoring programs include: (1) psychosocial support; (2) career guidance, and (3) academic and program guidance.

Third, and most importantly, is the need for more rigorous research designs in the studies of undergraduate mentoring programs. Although these problems were identified by Jacobi in 1991, little overall progress has been made. Modern mentoring programs need to have adequate sample sizes, be in more than one geographic location, be broadly focused, use comparison groups that will allow for within- and between-subject analysis, and use (pre- and post-mentoring) psychometrically sound subjective assessment, as well as objective assessments. By addressing these design issues, future researchers can improve the external and internal validity of their program, and better understand if mentoring programs are indeed helping students achieve their educational goals.

Lastly, each of the best practices identified in this review need to be carefully worked through. Implementing these best practices will help clarify expectations for mentor and mentee and ultimately improve the overall experience of mentoring.

## References

- Aikens, M. L. (1), Sadselia, S. (2), Watkins, K. (2), Eby, L. T. (3), Evans, M (4), & Dolan, E. L. (5). (n.d.). A social capital perspective on the mentoring of undergraduate life science researchers: An empirical study of Undergraduate–Postgraduate–Faculty triads. *CBE Life Sciences Education*, 15(2). <https://doi-org.dist.lib.usu.edu/10.1187/cbe.15-10-0208>.
- American Institutes for Research (AIR). (2017). *The Condition of Education 2017. NCES 2017-144. National Center for Education Statistics*. National Center for Education Statistics. Retrieved from <http://search.ebscohost.com.dist.lib.usu.edu/login.aspx?direct=true&db=eric&AN=ED574257&site=eds-live>
- Anderson, G. N., & And Others. (1995). *Mentors and Proteges: The Influence of Faculty Mentoring on Undergraduate Academic Achievement*. Retrieved from <http://search.ebscohost.com.dist.lib.usu.edu/login.aspx?direct=true&db=eric&AN=ED400761&site=eds-live>
- Behar-Horenstein, L. S., Roberts, K. W., & Dix, A. C. (2010). Mentoring undergraduate researchers: An exploratory study of students' and professors' perceptions. *Mentoring & Tutoring: Partnership in Learning*, 18(3), 269–291.
- Bergerson, A. A., Hotchkins, B. K., & Furse, C. (2014). Outreach and identity development: New perspectives on college student persistence. *Journal of College Student Retention: Research, Theory and Practice*, 16(2), 165-185.
- Boyle, P., & Boice, B. (1998). Systematic mentoring for new faculty teachers and graduate teaching assistants. *Innovative Higher Education*, 22, 157-180.
- Campbell, C. D. (2010). Best practices for student-faculty mentoring programs. In T. D. Allen & L. T. Eby (Eds.), *The Blackwell Handbook of Mentoring: A Multiple Perspectives Approach* (pp. 325-343). Hoboken: Print. John Wiley & Sons.
- Campbell, T. A., & Campbell, D. E. (1997). Faculty/Student Mentor Program: Effects on Academic Performance and Retention. *Research in Higher Education*, 38(6), 727–742. <https://doi.org/10.1023/A:1024911904627>

- Castellanos, J., Gloria, A. M., Besson, D., & Harvey, L. O. (2016). Mentoring Matters: Racial-Ethnic Minority Undergraduates' Cultural Fit, Mentorship, and College and Life Satisfaction. *Journal of College Reading and Learning*, 46(2), 81-98. doi:10.1080/10790195.2015.1121792
- Cornelius, V., Wood, L., & Lai, J. (2016). Implementation and evaluation of a formal academic-peer-mentoring programme in higher education. *Active Learning in Higher Education*, 17(3), 193–205. <https://doi.org/10.1177/1469787416654796>.
- Crisp, G., & Cruz, I. (2009). Mentoring College Students: A critical Review of the Literature Between 1990 and 2007. *Research in Higher Education*, 50(6), 525-545. <https://doi.org/10.1007/s11162-009-9130-2>.
- Crisp, G., Baker, V. L., Griffin, K. A., Lunsford, L. G., & Pifer, M. J. (2017). Special Issue: Mentoring Undergraduate Students. *ASHE Higher Education Report*, 43(1), 1–117. Retrieved from <https://eric.ed.gov/?id=EJ1166861>
- DeAngelo, L., Mason, J., & Winters, D. (2015, November 7). Faculty Engagement in Mentoring Undergraduate Students: How Institutional Environments Regulate and Promote Extra-Role Behavior. Retrieved from <https://link.springer.com/article/10.1007/s10755-015-9350-7>
- Fassinger, R. El, & Hensler-McGinnis, N. F. (2005). Multicultural feminist mentoring as individual and small-group pedagogy. In C. Z. Enns & A. L. Sinacore (Eds.), *Teaching and social justice: Integrating multicultural and feminist theories in the classroom* (pp. 143-161). Washington, DC: American Psychological Association.
- Gallup, Inc. (2016, December). Gallup-Purdue Index Report 2016. Retrieved June 22, 2019 from <https://news.gallup.com/reports/199229/gallup-purdue-index-report-2016.aspx>.
- Gershenfeld, S. (2014). A Review of Undergraduate Mentoring Programs. *Review of Educational Research*, 84(3), 365. Retrieved from <http://search.ebscohost.com.dist.lib.usu.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.24434241&site=eds-live>
- Haeger, H., & Fresquez, C. (2016). Mentoring for Inclusion: The Impact of Mentoring on Undergraduate Researchers in the Sciences. *CBE—Life Sciences Education*, 15(3). doi:10.1187/cbe.16-01-00164.
- Hall, R., & Jaugietis, Z. (2011). Developing peer mentoring through evaluation. *Innovative Higher Education*, 36(1), 41-52. doi:10.1007/s10755-010-9156-6.

- Hernandez, P. R., Bloodhart, B., Barnes, R. T., Adams, A. S., Clinton, S. M., Pollack, I., et al. (2017). Promoting professional identity, motivation, and persistence: Benefits of an informal mentoring program for female undergraduate students. *PLoS ONE* 12(11): e0187531. <https://doi.org/10.1371/journal.pone.0187531>
- Fischer, E. V. (2017). Promoting professional identity, motivation, and persistence: Benefits of an informal mentoring program for female undergraduate students. *Plos One*, 12(11). doi:10.1371/journal.pone.0187531
- Ingraham, K. C., Davidson, S. J., & Yonge, O. (2018). Student-faculty relationships and its impact on academic outcomes. *Nurse Education Today*, 71. Retrieved July 7, 2019, from <https://www.sciencedirect.com/science/article/pii/S0260691718304362>
- Ismail, A., Abdullah, N., Ridzwan, A.A., Wan Ibrahim, W.N.A. & Ismail, Y. (2015). Effect of Mentorship Program on Mentees' Psychosocial Development. *International Letters of Social and Humanistic Sciences*, 49, 53-65. Retrieved July 29, 2019 from <https://www.learntechlib.org/p/176730/>.
- Jackson, K. F. (2009). Building cultural competence: A systematic evaluation of the effectiveness of culturally sensitive interventions with ethnic minority youth. *Children and Youth Services Review*, 31, 1192-1198. doi: 10.1016/j.childyouth.2009.08.001
- Jacobi, M. (1991). Mentoring and Undergraduate Academic Success: A Literature Review. *Review of Educational Research*, 61(4), 505–532. <https://doi.org/10.3102/00346543061004505>
- Johnson, W. B. (2002). The intentional mentor: Strategies and guidelines for the practice of mentoring. *Professional Psychology: Research and Practice*, 33(1), 88–96. doi: 10.1037/0735-7028.33.1.88
- Johnson, W. B, Rose, G., & Schlosser, L.Z. (2007). Student-faculty mentoring: Theoretical and Methodological issues. *The Blackwell handbook of mentoring: A multiple perspective Approach*. Chichester, West Sussex: John Wiley & Sons.
- Kahveci, A., Southerland, S. A., & Gilmer, P. J. (2006). Retaining undergraduate women in science, mathematics, and engineering. *Journal of College Science Teaching*, 36(3), 34–38. Retrieved from <http://content.ebscohost.com/ContentServer.asp?EbscoContent=dGJyMNLe80Sep rY4v%2BvlOLCmr1Gep7NSsqi4SbSWxWXS&ContentCustomer=dGJyMPPq34Dx6vNT69fnhrnb4ovf5ucA&T=P&P=AN&S=R&D=eft&K=507928264>.



- Kardash, C. M. (2000). Evaluation of undergraduate research experience: Perceptions of undergraduate interns and their faculty mentors. *Journal of Educational Psychology, 92*(1), 191.
- Livingston, J. (2018). Faculty-Student Mentoring Program in the Digital Media Department at East Tennessee State University. *International Journal of Arts & Sciences, 11*(1), 233-236. Retrieved from <https://login.dist.lib.usu.edu/login?url=https://search.proquest.com/docview/2168817324?accountid=14761>.
- Livingstone, N., & Naismith, N. (2018). Faculty and undergraduate student perceptions of an integrated mentoring approach. *Active Learning in Higher Education, 19*(1), 77–92. <https://doi.org/10.1177/1469787417723233>
- Long, E. C. J., et. Al. (2010). Mentoring Undergraduates: Professors Strategically Guiding the Next Generation of Professionals. *Michigan Family Review, 14*(1). doi: 10.3998/mfr.4919087.0014.104
- Maschela, L. M., & Mabika, M. (2017). An Assessment of the Impact of the Mentoring Programme on Student Performance. *Journal of Student Affairs in Africa, 5*(2). doi: 10.24085/jsaa.v5i2.2707
- McFarland, J., Hussar, B., de Brey, C., Snyder, T., Wang, X., Wilkinson-Flicker, S., Gebrekristos, S., Zhang, J., Rathbun, A., Barmer, A., Bullock Mann, F., and Hinz, S. (2017). *The Condition of Education 2017*. National Center for Education Statistics. Retrieved April 5, 2020, from [https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2017144](https://nces.ed.gov/pubsearch/pubsearch/pubsinfo.asp?pubid=2017144)
- McWilliams, & E., A. (2016, November 30). *Wake Forest University: Building a Campus-Wide Mentoring Culture*. Retrieved May 7, 2019, from <https://eric.ed.gov/?id=EJ1152732>.
- Ross, T., Kena, G., Rathbun, A., KewalRamani, A., Zhang, J., Kristapovich, P., Manning, E. (2012). Higher Education: Gaps in Access and Persistence Study. Statistical Analysis Report. NCES 2012-046. *National Center for Education Statistics*. Retrieved from <http://search.ebscohost.com/dist.lib.usu.edu/login.aspx?direct=true&db=eric&AN=ED534691&site=eds-live>
- Nora, A., & Crisp, G. (2007). Mentoring Students: Conceptualizing and Validating the Multi-Dimensions of a Support System. *Journal of College Student Retention: Research, Theory & Practice, 9*(3), 337-356. doi:10.2190/cs.9.3.e

- Pascarella, E. T., & Blaich, C. (2013). Lessons from the Wabash National Study of Liberal Arts Education. *Change: The Magazine of Higher Learning*, 45(2), 6-15. doi:10.1080/00091383.2013.764257
- Phinney, J. S., Torres Campos, C. M., Padilla Kallemeyn, D. M., & Kim, C. (2011). Processes and Outcomes of a Mentoring Program for Latino College Freshmen: Mentoring Latino College Freshmen. *Journal of Social Issues*, 67(3), 599–621. <https://doi.org/10.1111/j.1540-4560.2011.01716.x>
- Rodger, S., & Tremblay, P. F. (2003). The effects of a peer mentoring program on academic success among first year university students. *The Canadian Journal of Higher Education*, 33(3), 1–18. Retrieved from: <http://content.ebscohost.com/ContentServer.asp?EbscoContent=dGJyMNLe80SepY4v%02BvlOLCmr1Gep7RSrqi4SbCWxWXS&ContentCustomer=dGJyMPPq34Dx6vNT69fnhrnb4ovf5ucA&T=P&P=AN&S=R&D=eft&K=507804063>
- Salinitri, G. (2005). The Effects of Formal Mentoring on the Retention Rates for First Year, Low Achieving Students. *Canadian Journal of Education / Revue Canadienne De L'éducation*, 28(4), 853. doi:10.2307/4126458
- Sandner, M. (2015). The effects of high-quality student mentoring. *Economics Letters*, 136, 227-232. Doi; 10.1016/j.econlet.2016.09.043.
- Shapiro, D., Dundar, A., Huie, F., Wakhungu, P. K., Bhimdiwala, A., Wilson, S. E., ... Indiana University. (2018). Completing College: A National View of Student Completion Rates -- Fall 2012 Cohort (Signature Report No. 16). *National Student Clearinghouse*. Retrieved from <http://search.ebscohost.com.dist.lib.usu.edu/login.aspx?direct=true&db=eric&AN=ED595341&site=eds-live>
- Shapiro, E. S., & Blom-Hoffman, J. (2004). Mentoring, modeling, and money: The 3 Ms of producing academics. *School Psychology Quarterly*, 19, 365-381.
- Sharma, R., and Writer, S. (2015). Cognitive-Behavioural Approach in Mentoring College Students for Personal Effectiveness: An Empirical Study. *Scholedge International Journal of Multidisciplinary & Allied Studies*, 2(5), 36-42.
- Shelton, E. N. (2012). A Model of Nursing Student Retention. *International Journal of Nursing Education Scholarship*, 9(1), 1-16. doi:10.1515/1548-923x.2334

- Smith, Mary L., (2017) "Perceived Ideal Traits of a Mentor as Viewed By African American Students In Science, Technology, Engineering, and Mathematics". *Dissertations*. 1416. <https://aquila.usm.edu/dissertations/1416>
- Sorrentino, D. M. (2007). The SEEK Mentoring Program: An Application of the Goal-Setting Theory. *Journal of College Student Retention: Research, Theory & Practice*, 8(2), 241–250. Retrieved from <http://search.ebscohost.com.dist.lib.usu.edu/login.aspx?direct=true&db=eric&AN=EJ744662&site=eds-live>
- Swail, W. S., Association for the Study of Higher Education., ERIC Clearinghouse on Higher Education, W. D., & George Washington Univ., W. D. G. S. of E. and H. D. (2003). *Retaining Minority Students in Higher Education: A Framework for Success. ASHE-ERIC Higher Education Report*. Jossey-Bass Higher and Adult Education Series. Retrieved from <http://search.ebscohost.com.dist.lib.usu.edu/login.aspx?direct=true&db=eric&AN=ED483024&site=eds-live>
- Thiry, H., & Laursen, S. L. (2011). The role of student-advisor interactions in apprenticing undergraduate researchers into a scientific community of practice. *Journal of Science Education and Technology*, 20(6), 771–784.
- Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago, IL: University of Chicago Press.
- Tinto, V., (1993). *Leaving College: Rethinking the causes and cures of student attrition* (2<sup>nd</sup> ed). Chicago and London: The University of Chicago Press.
- Wirt, J., Choy, S., Rooney, P., Provasnik, S., Sen, A., Tobin, R., ... National Center for Education Statistics, E. W. D. (2004). *The Condition of Education 2004*. NCES 2004-077. *US Department of Education*. Retrieved from <http://search.ebscohost.com.dist.lib.usu.edu/login.aspx?direct=true&db=eric&AN=ED483070&site=eds-live>