

# **Agency, Socialization, and Support: A Critical Review of Doctoral Student Attrition**

Kenneth L Rigler Jr, Ph.D.  
Fort Hays State University

Linda K. Bowlin, Ph.D.  
Southeastern University

Karen Sweat, Ed.D.  
Northcentral University

Stephen Watts, Ph.D.  
Oracle University

Robin Throne, Ph.D.  
Northcentral University

Rigler, K. L., Bowlin, L. K., Sweat, K., Watts, S., & Throne, R. (2017). Agency, socialization, and support: A critical review of doctoral student attrition. Paper presented at the 3<sup>rd</sup> International Conference on Doctoral Education, University of Central Florida.

# **Agency, Socialization, and Support: A Critical Review of Doctoral Student Attrition**

## **Abstract**

Almost universally, residential doctoral programs have reported attrition rates of up to 50% for face-to-face programs and 50-70% for online doctoral programs. The purpose of this critical review was to explore current literature for doctoral attrition and persistence to explore reasons and attributes for improved persistence to completion. We analyzed a final sample of 79 studies for context with doctoral attrition and persistence and, following coding, pattern matching, and synthesis, four final constructs emerged: (a) chair agency and chair-candidate relationship; (b) candidate socialization and support systems; (c) candidate preparedness; and (d) financial considerations. These constructs indicated that internal factors from within the doctoral program have affected attrition and we encourage doctoral educational leadership to implement strategies to improve dissertation chair practices through professional development, increased candidate support and socialization opportunities, creation of clearer pathways from academic to dissertation research coursework, and improved financial opportunities and support for candidates. We recommend quantitative explanatory studies to further examine the four factors within the doctoral program to examine the effects on doctoral candidate completion.

**Keywords:** doctoral student attrition, doctoral student persistence, all but dissertation

## **Introduction**

The prominence of a doctorate degree to both an individual candidate and American society as a whole has never been greater. The individual candidate's return on investment of a doctoral education can be significant for career advancement, career

change, compensation, leadership development, and life quality intimations resulting from the attainment of the doctoral degree (Brill, Balcanoff, Land, Gogarty, & Turner, 2014). Individuals with doctoral degrees hold the lowest unemployment rate (1.9%) of all degree levels and the highest median weekly income (Bureau of Labor Statistics, 2010). Gains for society have been seen for the 1.7 million research (practitioner and traditional) doctorates awarded and measured since 1957 across all sectors of higher education and have enhanced the personal and professional lives of executive leadership across academic, governmental, institutional, employer, and employee perspectives (National Science Foundation, 2009). The return to a knowledge-driven society from a prepared doctoral-level scholar-practitioner has value in the use of formal inquiry to solve the real problems of practice and discover innovations that benefit the field (Offerman, 2011; Throne, 2012).

Even though benefits to both the individual and larger society have been seen, doctoral program attrition rates have continued to be a problem across doctoral programs worldwide (Council of Graduate Schools [CGS] 2010, 2014, 2015a, 2015b). Almost universally, residential doctoral programs have reported attrition rates of up to 50% and nearly 50-70% for online doctoral programs (Terrell, Snyder, Dringus, & Maddrey, 2012), and this loss of potential doctorates has limited applicants for positions requiring a doctorate and depleted resources from universities and students (Willis & Carmichael, 2011).

As attrition rates maintain unacceptable levels, doctoral-granting institutions are faced with diagnosing the contributing factors for attrition and developing corrective measures in order to demonstrate continuous improvement for both internal and external

accountability entities (Bogle, 2010; Levitch & Shaw, 2014). The purpose of this study was to critically review the current doctoral attrition literature in order to identify the relevant themes relating to the worldwide doctoral attrition phenomenon, most specifically within the U.S., as a study of doctoral attrition with the intent to improve doctoral education completion may benefit the various sectors of society and provide doctoral-granting programs evidence-based themes for continuous improvement.

### **Source, Survey, and Analysis**

The total initial articles sourced included 87 that were identified using key words *doctoral attrition* and *doctoral persistence* from pertinent general and education academic databases that included ProQuest, EbscoHost, and Google Scholar. Four were excluded in the initial evaluation as studies did not meet the recency requirement of 2010 to present, and the remaining 83 sources were surveyed and coded for pattern matching from which four final constructs were determined for analysis and synthesis: (a) chair agency and chair-candidate relationship; (b) candidate socialization and support systems; (c) candidate preparedness; and (d) financial considerations. Chair, advisor, and mentor were often used synonymously, and these synonyms were retained in the analysis. An additional five sources were excluded following coding as no patterns were identified to align with the four constructs. The final 79 studies were analyzed for context with doctoral attrition and persistence and key findings, and were collectively synthesized following analysis in context with the construct patterns that emerged in preliminary and final analysis. The interrelationships among findings that bridged the constructs are presented in the discussion and conclusion.

#### ***Chair agency and the chair-candidate relationship***

The high attrition rate in doctoral programs has driven university officials to intensify efforts to identify why students are exiting the program prior to completion and closely examine the relationship between the advisor and student (Cockrell & Shelley, 2011). A positive and non-hierarchical relationship between the doctoral committee chair and the doctoral candidate has been identified as one of the most critical factors in the successful completion of a doctorate degree (Bitzer, 2011; Stallone, 2011; Storms et al., 2011); however, only 26 of 457 (6%) candidate respondents identified their supervisor in a positive light (Bégin & Gérard; 2013) and when surveyed, doctoral students repeatedly identified the most consistent and significant barrier to their success in the degree program was a problematic relationship with the dissertation chair (Willis & Carmichael, 2011). Doctoral program leaders also confirmed the importance of a positive relationship between dissertation advisor and doctoral candidate as they identified insufficient supervisor support as a significant factor in doctoral attrition (Herman, 2011; Kyvik & Olsen, 2014).

Doctoral candidates need access to regular communication with the dissertation chairs (Holmes, Trimble, & Morrison-Danner, 2014), and Holley and Caldwell (2011) found that students in doctoral programs were more likely to complete their program and experience greater satisfaction when they were engaged in meaningful interaction with the advisor. Chairs who were overly involved in their own research agenda and thus not available for regular candidate supervision and feedback were a detriment to candidate success (Herman, 2011; Holmes et al., 2014; Van de Schoot, Yerkes, Mouw, & Sonneveld, 2013); whereas, advisors who were not only available but also initiated regular student meetings had advisees with higher completion rates (Stock & Siegfried, 2014).

As doctoral candidates had the opportunity to interact with the dissertation chair, it was important for a cooperative relationship to be established based on clear expectations between the candidate and chair (Hardre & Hackett, 2015). Moxham, Dwyer, and Reid-Searl (2013) found supervisors and students had similar viewpoints for topic knowledge and work ethic, but found major differences in expectations for research methodology support and the initiation of communication resulting in a break-down in the successful partnership between the candidate and chair. Within this cooperative relationship, Brill et al. (2014) noted a candidate needed a dissertation chair who was willing to go beyond the supervisory role to focus solely on task completion, and a chair willing to provide individualized learning through effective faculty mentoring.

The dissertation chair was found to be a pivotal determinant of student success in a program (Hyatt & Williams, 2011); yet, few doctoral programs required, or even provided, professional development opportunities for dissertation chairs to improve their mentoring skills. Dissertation chairs need not be experts in the specific topic of study, but should also be experts in the areas of the research process and effective mentoring (Storms et al., 2011). The establishment of faculty mentoring improvement was necessary to foster deeper mentor-mentee relationships, which may enhance the doctoral experience for candidates and improve overall persistence (Fountaine, 2012). In Norway, a country where doctoral programs are government subsidized, federal regulations were implemented involving the inclusion of doctoral faculty mentoring training and as a result there was an increase in doctoral completion each year (Kyvik & Olsen, 2014).

Not all faculty make good dissertation chairs but they are one of the greatest assets to the doctoral program (Hyatt & Williams, 2011); therefore, continuous professional

development expectations are needed for all dissertation supervisors and should include elements of improving interactive communication (Moak & Walker, 2014), rapport building skills (Holley & Caldwell, 2011), service and collegueship (Hyatt & Williams, 2011), and relational collaboration (O'Meara, Knudsen, & Jones, 2013). Additionally, Hyatt and Williams (2011) emphasized the importance of the supervisors' pedagogical and research skills to provide accurate and effective guidance through the dissertation journey.

### ***Candidate socialization and support systems***

Previous research has identified social isolation as one of the main factors associated with doctoral attrition indicating effective doctoral programs needed to incorporate positive social experiences and structures for candidates (Jairam & Kahl, 2012). West, Gokalp, Peña, Fisher, and Gupton (2011) commented on the struggle doctoral students experienced when they were socially and intellectually isolated and the effect of isolation on the time to degree and program completion. Faculty, doctoral students, and universities remain concerned about factors that cause delays and/or attrition and how social integration factors, such as the nature of advising and dissertation topic, are viewed in importance (Wao & Onwuegbuzie, 2011). Espino (2014) examined the problems of minority graduate students, and observed that to be successful in graduate school, students benefitted from socialization into the academic environment as well as resources available from their community, family, or the graduate environment. Stubb, Pyhalto, and Lonka (2011) noted it was not unusual for a Ph.D. program to take several years to complete and involve an experience with stress, doubt, and exhaustion; however, a mismatch between the individual and the environment can lead to negative experiences such as stress and burn-out, and the scholarly community played an

important role in the socio-psychological well-being of the doctoral student. A positive relationship in the scholarly community can also be a beneficial buffer in times of stress, and the maintenance of socio-psychological well-being during the doctoral program may be carried forward long after the doctoral degree is finished (Stubb et al., 2011).

Doctoral online programs that allow working adults to continue professional careers while completing a doctorate have increased in popularity resulting in the need for universities to take collective responsibility for the success or failure of these candidates by structuring student-to-student support networks for distance learners (Terrell et al., 2012). Cockrell and Shelley (2011) found significant relationships among indicators for the support systems and student satisfaction, and recommended that doctoral programs increase support systems to improve student attrition. Stallone (2011) also emphasized the importance of student-cohort relationships and human factors that remain under the control of the university, which has affected attrition levels, and Holmes et al. (2014) suggested students needed opportunities to learn from each other, such as teambuilding, to reduce social isolation. Gardner (2010) agreed that doctoral student support needed improvement and an increased understanding of doctoral student socialization may assist faculty and administrators to better support doctoral students to higher rates of completion.

Levitch and Shaw (2014) reported elements that impacted retention in an online learning environment that included (a) program design, (b) orientation and use of the online environment, (c) faculty and leadership system support, (d) learning style, and (e) recognition of student needs. Doctoral student retention rates may be impacted that could benefit the institution and assist the faculty by providing a satisfactory experience for the



student, and the authors noted that when doctoral students were satisfied with the learning environment, they were more likely to complete the educational program pursued, and students not satisfied with the educational experiences were more likely to drop (Levitch & Shaw, 2014). Rockinson-Szapkiw, Heuvelman-Hutchinson, and Spaulding (2014) noted online doctoral students who used web-based technologies for communication had a higher sense of connectedness than doctoral students who used the phone or email, and results highlighted how web-based communication tools can increase connectedness and decrease doctoral attrition. Likewise, Kiley (2011) found student support systems to be an area in need of improvement as student satisfaction impacted attrition, which paralleled findings by Lott, Gardner, and Powers (2010), who posited doctoral students may leave the doctoral program due to a lack of socialization, especially those who are relatively isolated demographically.

Luna (2010) focused on cohort programs and the benefits of cohort support at any level of education, not just doctoral, and found that candidates with realistic expectations of the doctoral program tend to persist and complete the degree. Martinez, Ordu, Della Sala, and McFarlane (2013) noted doctoral students typically did not leave the program for one reason but chose to leave due to multiple factors that included support and isolation. Byers et al. (2014) also discovered that students felt that outside support systems were vital in meeting the challenges of doctoral programs, and benefited from coping strategies that included the cohort and support by family, friends, and other doctoral students. Finally, Carter, Blumenstein, and Cook (2013) focused on gender differences as women were significantly overrepresented compared to men in seeking counseling sessions for relationships and family issues, possibly indicating that home and

family issues impact women more than school issues.

### ***Candidate preparedness***

Often doctoral candidates did not understand that success in doctoral studies required a different skill set than what they previously possessed (Brill et al., 2014). Candidates with certain skills and preparation were found to be more likely to persist than those without these skills and preparation factors that influenced degree completion may be categorized as motivation, psychological, prior academic preparation, program preparation, and demographics (Bitzer, 2011; Brill et al., 2014; Mason, 2012; Stock & Siegfried, 2014). Motivation (and corresponding goal setting) was identified in the past research as a key attribute to persistence (Bain, Fedynich, & Knight, 2007; Bitzer, 2011; Herman, 2011; Spaulding & Rockinson-Szapkiw, 2012) and to the amount of time needed to complete a doctoral degree (Wao & Onwuegbuzie, 2011). Offerman (2011) found the reasons a candidate had for pursuing the degree was a significant factor in persistence, and other researchers determined that the most effective reasons were desire for development (Bégin & Gérard, 2013), self-improvement (Bain et al., 2007; Bégin & Gérard, 2013), learning (Bégin & Gérard, 2013), better employment opportunities (Holley & Gardner, 2012), improved quality of life (Holly & Gardner, 2012), and achievement (Bégin & Gérard, 2013; Holly & Gardner, 2012).

Doctoral candidate satisfaction was strongly correlated with motivation (Mason, 2012), as was the amount of time a student spent on task (Gardner, 2010; Moxham et al., 2013), the ability to work independently (Bitzer, 2011; Mason, 2012; Litalien & Guay, 2015; O'Meara et al., 2013; Stock & Siegfried, 2014), and the priority for the doctorate (Santicola, 2013). Hardre and Hackett (2015) identified graduate student desire for

guidelines of expectations for degree completion, and noted that attrition rates correlated to the gap between program expectations and reality (see also Levitch & Shaw, 2014). Thus, candidates who had realistic expectations of the doctoral program tended to persist and complete (Luna, 2010), while those with unfilled expectations were more likely to drop out (Martinez et al., 2013). Several researchers also found that resiliency (Rockinson-Szapkiw, Spaulding, Swezey, & Wicks, 2014), the capacity to maintain one's socio-psychological well-being (Stubb et al., 2011), or, simply, coping skills (Spaulding & Rockinson-Szapkiw, 2012) enhanced candidate ability to persist. Finally, persistence increased based on personal characteristics such as learning or thinking style (Bitzer, 2011; Spaulding & Rockinson-Szapkiw, 2012), knowledge (Bitzer, 2011), intelligence (Bitzer, 2011; Spaulding & Rockinson-Szapkiw, 2012), and personality (Bitzer, 2011; Spaulding & Rockinson-Szapkiw, 2012) and decreases with personal issues (Brill et al., 2014; Herman, 2011; Willis & Carmichael, 2011) and an unwillingness or unpreparedness on the part of the candidate to embrace scholarly independence (Brill et al., 2014).

Lack of candidate ability or skills was identified as critical reasons why candidates failed to complete their degree (Herman, 2011; Kyvik & Olsen, 2014); thus, prior academic preparation was deemed a major factor in persistence (Ampaw & Jaeger, 2012). When institutions desired higher completions in their doctoral programs, several researchers encouraged candidacy evaluations prior to admission (van de Schoot et al., 2013) as high GRE scores (Gardner, 2010; Stock & Siegfried, 2014; Sutton, 2014), high ACT/SAT and undergraduate GPA (Gardner, 2010; Xu, 2014), especially from selective undergraduate programs (Xu, 2014), were predictive of high completion rates. Attrition

was also increased by candidates matriculating from lower quality undergraduate institutions (Sock & Siegfried, 2014), and other researchers noted students admitted to doctoral programs were not sufficiently prepared to write at the expected level (Moak & Walker, 2014; Sutton, 2014) or lacked necessary research skills (Bates & Goff, 2012; West et al., 2011). This lack of preparation or competence presents a challenge for degree completion (Bégin & Gérard, 2013; Bitzer, 2011; Cantwell, Scevak, Bourke, & Holbrook, 2012; Carter et al., 2013), and extended the time needed to complete (Wao & Onwuegbuzie, 2011).

Holmes et al. (2014) noted that students should be informed of the rigor associated with a doctoral program before program admission, especially when candidate is unclear about what is expected of them, what doctoral study entails, or the educational process, as these led to increased attrition (Burkholder, 2012; Espino, 2014; Moak & Walker, 2014). This lack of clarity was also exacerbated by dissertation work being unstructured, unfamiliar, and unlike other prior scholastic work (West et al., 2011). Erwee, Albion, and van den Laan (2013) recommended that doctoral students should have additional research methods training courses to aid in better understanding the research process, and to provide essential resources (Kiley, 2011).

Individual characteristics were also identified as factors that affected attrition and persistence in doctoral programs (Spaulding & Rockinson-Szapkiw, 2012; van de Schoot et al., 2013). For example, married students had a higher retention rate than unmarried students and as age increased, the probability of dropping out decreased (Lott et al., 2010). Thus, many of the factors that enhanced persistence or engendered attrition in doctoral programs were quite individual and unique characteristics of each candidate

(Lott et al., 2010; Spaulding & Rockinson-Szapkiw, 2012; van de Schoot et al., 2013).

### ***Financial considerations***

A final major theme found in research of doctoral attrition and persistence was the financial conditions doctoral candidates faced (Brill et al., 2014; Herman, 2011; Martinez et al., 2013), and while a single factor does not typically cause students to leave a doctoral program, financial factors may certainly contribute (Martinez et al., 2013). Litalien and Guay (2015) countered that financial factors did not significantly affect attrition, but their study was performed at a site where tuition was extremely low. Continuing enrollment in a doctoral program from a financial position was generally based on current costs (Ampaw & Jaeger, 2012; Bain et al., 2007), opportunity costs (Ampaw & Jaeger, 2012), potential and actual support (Ampaw & Jaeger, 2012; Holly & Caldwell, 2012; Kim & Otts, 2010; Wao & Onwuegbuzie, 2011), and the expected benefits of attaining the degree (Ampaw & Jaeger, 2012; Bain et al., 2007; Bates & Goff, 2012; Holley & Gardner, 2012; Jones, 2013), all which have been seen to contribute to candidate attrition and persistence (Willis & Carmichael, 2011).

Several studies also found that as the length of a program was extended, costs mounted as well as current financial responsibilities (Hardre & Hackett, 2015) that added to student stress (Kim & Otts, 2010) and made continued matriculation more difficult for those without financial support (Holly & Caldwell, 2012; Kim & Otts, 2010; West et al., 2011). Kim and Otts (2010) found that students who paid for their degree incrementally, without other support, were more likely to not complete or took longer (see also Gardner, 2010; Offerman, 2011). Conversely, doctoral students who had financial support in the form of research assistantships (Stock & Siegfried, 2014), scholarships (Jiranek, 2010),

or financial aid, were more likely to persist (Bates & Goff, 2012; Bitzer, 2011; Holly & Caldwell, 2012; Vassil & Solvak, 2012; Wao & Onwuegbuzie, 2011; West et al., 2011). Finally, when doctoral candidates were employed full-time to meet continuing obligations, attrition increased (Bain et al., 2007; Holly & Gardner, 2012; Santicola, 2013; Willis & Carmichael, 2011).

## Discussion

We reviewed prior research relating to doctoral attrition and found four key constructs consistent across the literature; (a) chair agency, (b) candidate socialization, (c) candidate preparedness, and (d) financial considerations. Our review of the current research indicates that high attrition rates are heavily influenced by internal program components and not external factors outside of the control of the university. As leaders of doctoral programs pursue solutions to overcome high attrition rates, the literature provides key approaches for increasing persistence to degree completion.

**Chair agency.** The characteristics of the dissertation chair, including the ability to establish and maintain a positive working relationship with their advisees, are key factors in doctoral persistence (Begin & Gerard, 2013; Bitzer, 2011; Stallone, 2011; Storms et al., 2011; Willis & Carmichael, 2011). Beyond expertise in writing, research methods, and institutional procedures (Hyatt & Williams, 2011), faculty advisors need expertise in mentoring through relationships, collaboration, and communication (Brill et al., 2014; Fountaine, 2012; Hardre & Hackett, 2015). Doctoral programs are encouraged to provide clear expectations and continuous professional development opportunities for faculty to

improve on dissertation pedagogy, research and procedural methods, and mentoring practices (Holley & Caldwell, 2011; Moak & Walker, 2014; O'Meara, Knudsen, & Jones, 2013).

**Candidate socialization.** Isolation is a key factor leading to attrition (Lott et al., 2010; Jairam & Kahl, 2012; West et al., 2011); whereas, on-going positive relationships with a scholarly community increase persistence to degree completion (Stubb et al., 2011). To overcome candidate isolation, doctoral programs need to establish effective socialization opportunities for candidates in both face-to-face and online environments (Cockrell and Shelley; 2011; Terrell et al., 2012). Best practices from other institutions demonstrate that cohort models, social networking tools, and study/collaboration groups were effective methods for increasing socialization (Gardner, 2010; Kiley, 2011; Rockinson-Szapkiw et al., 2014; Stallone, 2011).

**Candidate preparedness.** Though individual characteristics, circumstances, and preparation prior to entrance into a doctoral program affect persistence and are outside of the influence of a university (Lott et al., 2010; Spaulding & Rockinson-Szapkiw, 2012; van de Schoot et al., 2013), minimum entrance qualifications and dissertation preparation courses, or lack thereof, are within the control of the degree program (Ampaw & Jaeger, 2012; Gardner, 2010). Prior to acceptance, the level of rigor associated with the doctoral program along with the importance of setting realistic goals, rearranging priorities, and sustaining motivation should be made clear to potential candidates (Hardre & Hackett, 2015; Holmes et al., 2014; Luna, 2010). There should be increased emphasis on research methods and scholarly writing prior to the comprehensive exam (Erwee et al., 2013; Kiley, 2011). Too often, candidates experience a major shift in structure and expectations

following the comprehensive exams (i.e., after a majority of the coursework is completed), leaving candidates in unfamiliar territory, with limited resources, resulting in increased stress and time to degree completion (Wao & Onwuegbuzie, 2011; West et al., 2011). The doctoral program of study should incrementally increase in rigor leading candidates through a natural transition from academic coursework to the dissertation coursework where scholarly research and writing are expected.

**Financial considerations.** Similar to preparedness, the financial resources available to an individual candidate prior to entrance into the program are outside of the control of the university; however, institutions can control the types and amount of financial support provided by the doctoral program to the individual candidates. Doctoral students who received research assistantships, scholarships, and financial aid are more likely to persist (Bates & Goff, 2012; Bitzer, 2011; Holly & Caldwell, 2012; Vassil & Solvak, 2012; Wao & Onwuegbuzie, 2011; West et al., 2011). Therefore, as doctoral programs look to invest resources in overcoming high attrition rates, providing students with additional opportunities to receive financial support may be a clear and direct option for increasing persistence (Jiranek, 2010; Stock & Siegfried, 2014). Assistantships, where the candidate provides the university with a needed service, may provide the institution the best return on investment and significantly impact the candidate by not only providing financial support; but also increasing the candidate's relationships with the academic community and providing relevant experiences for scholarly research and writing.



## Conclusion

This critical review of current research surrounding the high attrition rates of doctoral education programs has demonstrated no shortage of factors contributing to the problem. The dichotomy of the responsibility of the university versus that of the student was explored, and while students must be held responsible for work, preparation, and dedication to the task, it was apparent that universities should be held accountable for providing candidates with qualified and engaged dissertation chairs, intrinsic socialization and support, resources for improved scholarly growth and candidate preparation within the program of study, and adequate financial support to improve doctoral candidate persistence and completion. We recommend future quantitative explanatory studies to examine internal doctoral program components and the four constructs we identified to further discover the effects of these factors on doctoral candidate persistence to completion.

## References

- Ampaw, F. D., & Jaeger, A. J. (2012). Completing the three stages of doctoral education: An event history analysis. *Research in Higher Education, 53*, 640-660.  
<http://dx.doi.org/10.1007/s11162-011-9250-3>
- Bain, S., Fedynich, L., & Knight, M. (2010). The successful graduate student: A review of the factors for success. *Journal of Academic and Business Ethics, 3*(7), 1-9. Retrieved from <http://www.aabri.com/manuscripts/10569.pdf>
- Bates, P. J., & Goff, L. (2012). The invisible student: Benefits and challenges of part-time doctoral studies. *Alberta Journal of Educational Research, 58*, 368-380. Retrieved from <http://ajer.journalhosting.ucalgary.ca/index.php/ajer/article/view/1054/894>
- Bégin, C., & Gérard, L. (2013). The role of supervisors in light of the experience of doctoral students. *Policy Futures in Education, 11*, 267-276.  
<http://dx.doi.org/10.2304/pfie.2013.11.3.267>
- Bitzer, E. M. (2011). Doctoral success as ongoing quality business: A possible conceptual framework. *South African Journal of Higher Education, 25*, 425-443. Retrieved from <http://www.sajhe.org.za/>
- Bogle, D. (2010). *Doctoral degrees beyond 2010: Training talented researchers for society*. Retrieved from League of European Research Universities website:  
[http://www.leru.org/files/publications/LERU\\_Doctoral\\_degrees\\_beyond\\_2010.pdf](http://www.leru.org/files/publications/LERU_Doctoral_degrees_beyond_2010.pdf)

- Brill, J. L., Balcanoff, K. K., Land, D., Gogarty, M., & Turner, F. (2014). Best practices in doctoral retention: Mentoring. *Higher Learning Research Communications*, 4(2), 26-37. Retrieved from <http://journals.sfu.ca>
- Bureau of Labor Statistics. (2010). Employment projections. Retrieved from [http://www.bls.gov/emp/ep\\_chart\\_001.htm](http://www.bls.gov/emp/ep_chart_001.htm)
- Burkholder, D. (2012). Returning counselor education doctoral students: Issues of retention, attrition, and perceived experiences. *Journal of Counselor Preparation and Supervision*, 4(2), 6-23. <http://dx.doi.org/10.7729/42.0027>
- Byers, V. T., Smith, R. N., Hwang, E., Angrove, K. E., Chandler, J. I., Christian, K. M., . . . Onwuegbuzie, A. J. (2014). Survival strategies: Doctoral students' perceptions of challenges and coping methods. *International Journal of Doctoral Studies*, 9, 109-136. Retrieved from <http://www.informingscience.org/Journals/IJDS/Overview>
- Cantwell, R. H., Scevak, J. J., Bourke, S., & Holbrook, A. (2012). Identifying individual differences among doctoral candidates: A framework for understanding problematic candidature. *International Journal of Educational Research*, 53, 68-79. <http://dx.doi.org/10.1016/j.ijer.2012.02.001>.
- Carter, S., Blumenstein, M., & Cook, C. (2013). Different for women? The challenges of doctoral studies. *Teaching in Higher Education*, 18, 339-351. <http://dx.doi.org/10.1080/13562517.2012.719159>

- Cockrell, C. N., & Shelley, K. (2011). The relationship between academic support systems and intended persistence in doctoral education. *Journal of College Student Retention: Research, Theory & Practice*, 12, 469-484.  
<http://dx.doi.org/10.2190/CS.12.4.e>
- Council of Graduate Schools. (2010). Executive summary: PhD completion project. Retrieved from <http://phdcompletion.org/information/book4.asp>
- Council of Graduate Schools. (2014). Graduate enrollment and degrees: 2003 to 2013. Retrieved from <http://www.cgsnet.org/graduate-enrollment-and-degrees-2003-2013-0>
- Council of Graduate Schools. (2015a). Doctoral initiative on minority attrition and completion. Retrieved from <http://www.cgsnet.org/doctoral-initiative-minority-attrition-and-completion-0>
- Council of Graduate Schools. (2015b). Understanding PhD career pathways for program improvement. Retrieved from <http://www.cgsnet.org/understanding-phd-career-pathways-program-improvement-0>
- Erwee, R., Albion, P. R., & van der Laan, L. (2013). Connectedness needs of external doctoral students. In B. Tynan, J. Willems, & R. James (Eds.), *Outlooks and opportunities in blended and distance learning* (pp. 316-329). Hershey, PA: Information Science Reference. <http://dx.doi.org/10.4018/978-1-4666-4205-8.ch023>
- Espino, M. M. (2014). Exploring the role of community cultural wealth in graduate school access and persistence for Mexican American PhDs. *American Journal of Education*, 120, 545-574. <http://dx.doi.org/10.1086/676911>

- Fountaine, T. P. (2012). The impact of faculty-student interaction on black doctoral students attending historically Black institutions. *The Journal of Negro Education*, 81, 136-147. <http://dx.doi.org/10.7709/jnegroeducation.81.2.0136>
- Gardner, S. K. (2010). Contrasting the socialization experiences of doctoral students in high and low-completing departments: A qualitative analysis of disciplinary contexts at one institution. *The Journal of Higher Education*, 81(1), 61-81. <http://dx.doi.org/10.1353/jhe.0.0081>
- Hardre, P. L., & Hackett, S. (2015). Defining the graduate college experience: What it “should” versus “does” include. *International Journal of Doctoral Studies*, 10, 57-77. Retrieved from <http://ijds.org/Volume10/IJDSv10p057-077Hardre0665.pdf>
- Herman, C. (2011). Obstacles to success—Doctoral student attrition in South Africa. *Perspectives in Education*, 29(3), 40-52. Retrieved from <http://www.perspectives-in-education.com/Default.aspx>
- Holley, K., & Caldwell, M. (2012). The challenges of designing and implementing a doctoral student mentoring program. *Innovative Higher Education*, 37, 243-253. <http://dx.doi.org/10.1007/s10755-011-0203-y>
- Holley, K. A., & Gardner, S. K. (2012). Navigating the pipeline: How socio-cultural influences impact first-generation doctoral students. *Journal of Diversity in Higher Education*, 5, 112-121. <http://dx.doi.org/10.1037/a0026840>

- Holmes, B., Trimble, M., & Morrison-Danner, D. (2014). Advancing scholarship, team building, and collaboration in a hybrid doctoral program in educational leadership. *Journal of College Teaching & Learning*, *11*, 175-180. Retrieved from <http://www.cluteinstitute.com/ojs/index.php/TLC/article/view/8855/8834>
- Hyatt, L., & Williams, P. E. (2011). 21st century competencies for doctoral leadership faculty. *Innovative Higher Education*, *36*, 53-66.  
<http://dx.doi.org/10.1007/s10755-010-9157-5>
- Jairam, D. & Kahl, D. H., Jr. (2012). Navigating the doctoral experience: The role of social support in successful degree completion. *International Journal of Doctoral Students*, *7*, 311-329. Retrieved from <http://www.informingscience.org/Journals/IJDS/Overview>
- Jiranek, V. (2010). Potential predictors of timely completion among dissertation research students at an Australian faculty of sciences. *International Journal of Doctoral Studies*, *5*, 1-13. Retrieved from <http://ijds.org/Volume5/IJDSv5p001-013Jiranek273.pdf>
- Jones, M. (2013). Issues in doctoral studies—Forty years of journal discussion: Where have we been and where are we going? *International Journal of Doctoral Studies*, *8*, 83-104. Retrieved from <http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1177&context=buspapers>
- Kiley, M. (2011). Government policy and research higher degree education. *Journal of Higher Education Policy and Management*, *33*, 629-640.  
<http://dx.doi.org/10.1080/1360080X.2011.621189>

- Kim, D., & Otts, C. (2010). The effect of loans on time to doctorate degree: Differences by race/ethnicity, field of study, and institutional characteristics. *Journal of Higher Education, 81*, 1-32. <http://dx.doi.org/10.1353/jhe.0.0079>
- Kyvik, S., & Olsen, T. B. (2014). Increasing completion rates in Norwegian doctoral training: Multiple causes for efficiency improvements. *Studies in Higher Education, 39*, 1668-1682. <http://dx.doi.org/10.1080/03075079.2013.801427>
- Levitch, D., & Shaw, M. (2014). Factors contributing to satisfaction and retention in an online doctoral program. *Journal of Online Higher Education, 5*(5). Retrieved from [http://www.thelearninginstitute.org/journal\\_pdf/JOHE - Factors Contributing to Satisfaction and Retention in an Online Doctoral Program.pdf](http://www.thelearninginstitute.org/journal_pdf/JOHE - Factors Contributing to Satisfaction and Retention in an Online Doctoral Program.pdf)
- Litalien, D., & Guay, F. (2015). Dropout intentions in PhD studies: A comprehensive model based on interpersonal relationships and motivational resources. *Contemporary Educational Psychology, 41*, 218-231. <http://dx.doi.org/10.1016/j.cedpsych.2015.03.004>
- Lott, J. L., Gardner, S., & Powers, D. A. (2010). Doctoral student attrition in the STEM fields: An exploratory event history analysis. *Journal of College Student Retention: Research, Theory & Practice, 11*, 247-266. <http://dx.doi.org/10.2190/CS.11.2.e>
- Luna, G. (2010). Succession planning: A doctoral program partnership for emerging community college leaders. *Community College Journal of Research & Practice, 34*, 977-990. <http://dx.doi.org/10.1080/10668921003723144>

- Martinez, E., Ordu, C., Della Sala, M. R., & McFarlane, A. (2013). Striving to obtain a school-work-life balance: The full-time doctoral student. *International Journal of Doctoral Studies*, 8, 39-59. Retrieved from <http://ijds.org/Volume8/IJDSv8p039-059Martinez0375.pdf>
- Mason, M. M. (2012). Motivation, satisfaction, and innate psychological needs. *International Journal of Doctoral Studies*, 7, 259-277. Retrieved from <http://ijds.org/volume7/IJDSv7p259-277Mason0345.pdf>
- Moak, S. C., & Walker, J. T. (2014). How to be a successful mentor. *Journal of Contemporary Criminal Justice*, 30, 427-442.  
<http://dx.doi.org/10.1177/1043986214541608>
- Moxham, L., Dwyer, T., & Reid-Searl, K. (2013). Articulating expectations for PhD candidature upon commencement: Ensuring supervisor/student 'best fit'. *Journal of Higher Education Policy and Management*, 35, 345-354.  
<http://dx.doi.org/10.1080/1360080X.2013.812030>
- National Science Foundation. (2009). *Doctorate recipients from U.S. universities: 2009*. Arlington, VA: Author.
- Offerman, M. (2011). Profile of the nontraditional doctoral degree student. *New Directions for Adult & Continuing Education*, 129, 21-30.  
<http://dx.doi.org/10.1002/ace.397>
- O'Meara, K., Knudsen, K., & Jones, J. (2013). The role of emotional competencies in faculty-doctoral student relationships. *The Review of Higher Education*, 36, 315-347.  
<http://dx.doi.org/10.1353/rhe.2013.0021>



- Raisman, N. A. (2013). The cost of college attrition at four-year colleges & universities. *The Educational Policy Institute*. Retrieved from [http://www.educational-policy.org/pdf/1302\\_PolicyPerspectives.pdf](http://www.educational-policy.org/pdf/1302_PolicyPerspectives.pdf)
- Rockinson-Szapkiw, A. J., Heuvelman-Hutchinson, L., & Spaulding, L. (2014). Connecting online: Can social networking and other technology support doctoral connectedness? *Journal of University Teaching & Learning Practice*, *11*(3), 4. Retrieved from <http://ro.uow.edu.au/jutlp/vol11/iss3/4>
- Rockinson-Szapkiw, A. J., Spaulding, L. S., Swezey, J., A., & Wicks, C. J. (2014). Poverty and persistence: A model for understanding individuals' pursuit and persistence in a doctor of education program. *International Journal of Doctoral Studies*, *9*, 181-190. Retrieved from <http://ijds.org/Volume9/IJDSv9p181-203Rockinson0606.pdf>
- Santicola, L. (2013). Pressing on: Persistence through a doctoral cohort program in education. *Contemporary Issues in Education Research*, *6*, 253-264. Retrieved from <http://www.cluteinstitute.com/ojs/index.php/CIER/article/view/7736>
- Spaulding, L. S., & Rockinson-Szapkiw, A. J. (2012). Hearing their voices: Factors doctoral candidates attribute to their persistence. *International Journal of Doctoral Studies*, *7*, 199-219. Retrieved from <http://ijds.org/Volume7/IJDSv7p199-219Spaulding334.pdf>
- Stallone, M. N. (2011). Factors associated with student attrition and retention in an educational leadership doctoral program. *Journal of College Teaching & Learning* *1*(6). Retrieved from <http://www.cluteinstitute.com/ojs/index.php/TLC/article/view/1952/1931>

- Stock, W. A. & Siegfried, J. J. (2014). Fifteen years of research on graduate education in economics: What have we learned? *Journal of Economic Education*, 45, 287-303. <http://dx.doi.org/10.1080/00220485.2014.942410>
- Storms, B. A., Prada, M. J., & Donahue, E. N. (2011). Advising doctoral candidates to degree completion. *Educational Leadership and Administration: Teaching and Program Development*, 23, 85-92. Retrieved from <http://files.eric.ed.gov/fulltext/EJ965229.pdf>
- Stubb, J., Pyhalto, K., & Lonka, K. (2011) Balancing between inspiration and exhaustion: PhD students' experienced socio-psychological well-being. *Studies in Continuing Education*, 33, 33-50. <http://dx.doi.org/10.1080/0158037X.2010.515572>
- Sutton, R. (2014). Unlearning the past: New foundations for online student retention. *Journal of Educators Online*, 11(1), 1-30. Retrieved from <http://www.thejeo.com/Archives/Volume11Number3/Sutton.pdf>
- Terrell, S. R., Snyder, M. M., Dringus, L. P., & Maddrey, E. (2012). A grounded theory of connectivity and persistence in a limited residency doctoral program. *The Qualitative Report*, 17(31), 1-14. Retrieved from <http://www.nova.edu/ssss/QR/QR17/terrell.pdf>
- Throne, R. (2012). *Practitioner research in doctoral education*. Dubuque, IA: Kendall/Hunt.
- Van de Schoot, R., Yerkes, M. A., Mouw, J. M., & Sonneveld, H. (2013). What took them so long? Explaining PhD delays among doctoral candidates. *PLOS One*, 8(7), e68839. <http://dx.doi.org/10.1371/journal.pone.0068839>

- Vassil, K., & Solvak, M. (2012). When failing is the only option: Explaining the failure to finish PhDs in Estonia. *Higher Education, 64*, 503-516.  
<http://dx.doi.org/10.1007/s10734-012-9507-6>
- Wao, H. O., & Onwuegbuzie, A. J. (2011). A mixed research investigation of factors related to time to the doctorate in education. *International Journal of Doctoral Studies, 6*, 115-134. Retrieved from <http://ijds.org/Volume6/IJDSv6p115-134Wao320.pdf>
- West, I. J. Y., Gokalp, G., Peña, E. V., Fisher, L., & Gupton, J. (2010). Exploring effective support practices for doctoral students' degree completion. *College Student Journal, 45*, 310-323. Retrieved from [http://works.bepress.com/cgi/viewcontent.cgi?article=1011&context=edlyn\\_pena](http://works.bepress.com/cgi/viewcontent.cgi?article=1011&context=edlyn_pena)
- Willis, B., & Carmichael, K.D. (2011). The lived experience of late-stage doctoral student attrition in counselor education. *The Qualitative Report, 16*(1), 192-207. Retrieved from <http://nsuworks.nova.edu/tqr/vol16/iss1/11>
- Xu, Y. J. (2014). Advance to and Persistence in Graduate School: Identifying the Influential Factors and Major-Based Differences. *Journal of College Student Retention: Research, Theory and Practice, 16*, 391-417. <http://dx.doi.org/10.2190/CS.16.3.e>