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Writing as an URM STEM Community: Increasing Competitiveness and Success of Underrepresented Minority STEM Pre-tenure Faculty and Postdoctoral Researchers through Community Grant and Other Academic Writing Experiences

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Dr. Joe Reustle is a marine ecologist and the PI of the Reustle Estuarine Ecology Lab (REEL) at HU MES. Dr. Reustle's research investigates species-interactions and how they influence community dynamics and assemblages. Specifically, Dr. Reustle's research focuses on community-level consequences for shifts in species-interactions due to (1) climate change and environmental perturbations (i.e., drought/flood, high intensity storm-events), (2) changes in predator/parasite field (i.e., reason for and consequences of changes in abundance of predator(s) and parasites), and (3) changes in sensory regime and behavior (i.e., changes in the visual or chemosensory profile; altered fear response to predators and/or parasites). Dr. Reustle's research intersects with and has expanded into habitat restoration and assessment where Dr. Reustle is interested in restoring habitat and ecosystem services. Dr. Reustle incorporates field and laboratory studies at the species, population, and community level to manipulate and better understand the mechanisms and consequences of changes in community dynamics.

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Abstract

During STEM Ph.D. studies, most dissertators are focused on conducting research, taking exams, and producing writing necessary for their graduation. Besides experiences in teaching and mentoring, to be competitive and successful in academic positions beyond the Ph.D. degree, participants must also demonstrate successful grantsmanship and research-related manuscript production in their portfolio.

This paper shares the experiences over the course of three years from TxARM AGEP Alliance and its cohort members (participants who began the program as Ph.D. candidates) as they participated in weekly writing sessions as a cohort, and demonstrates the benefits of writing in community as a mode of faculty professional development for underrepresented scholars. These weekly writing sessions started with an alternating focus on grant writing and academic job application packages. Each session began with a formal introduction to a key component to that week's focus, followed by goal setting for the writing portion of the session. Participants would work on relevant funding opportunities or specific job postings. In the second year, as the cohort members progressed at different paces and paths towards their academic career goals, the writing sessions became more informal, targeting individual needs. Weekly writing sessions captured writing for grants, research manuscripts, response to reviewers' and editor' comments, cover letters, teaching/research statements, diversity statements, patent applications and other forms of writing as needed. During the third year, as the cohort members accepted academic positions, the focus shifted to targeted grant writing (specifically including NSF and NIH proposals with early career focus) to increase the resilience and competitiveness of Underrepresented Minority (URM) academics in their current positions and beyond.

The URM cohort members indicated that although the writing sessions were only one hour, getting together as a group and writing as a community was very valuable for them. Even if the progress in the allotted time was limited, the debrief at the close of each one-hour writing session, where participants shared their successes and challenges, helped reinforce a sense of accomplishment. Beyond writing for their own individual needs, working with their URM cohort community – whose common goals and experiences gave them shared purpose and passion – served to motivate, support and boost morale for most participants.

Introduction

Writing skills and experiences with a variety of writing are necessary to be competitive when applying for positions in academia, and for remaining resilient and competitive in academic and related positions. Many researchers investigated different aspects of successful writing [1]-[16]. Parker described knowledge-centered writing in undergraduate engineering curriculum that guided students to turn from novice to expert problem solvers, expanding on their writing competencies [1]. This learner-centric writing method focused on writing competencies that students generally struggled with, thus highlighting skills that needed to be honed [1]. Bandyopadhyay explored a "writing in the discipline" program for critical writing where problem solving is part of technical courses and the writing thereof [2]. The small sample results showed higher student success with writing-intensive courses in developing critical writing skills in a construction management course [2]. Challenges of developing writing skills among undergraduate STEM curricula are addressed by Mayo and Wheaton [3] who state that writing assignments can be developed such that they assist students in connecting their technical work to real-world applications. In their lesson plan, the students were expected to post their work on a public platform encouraging students to produce quality work. Richards and Milanovic established partnerships with professional writing faculty, industry members and technical course instructors to mentor senior design project students in effective writing through paired teaching [4]. In a more recent article, Andrews *et al.* described engineering curriculum-wide and multidisciplinary efforts to build students' writing skills in technical courses through help from technical writing faculty in the English department [5]. The developed writing guidelines and Writing Center assistance resulted in improved writing skills among graduating seniors [5] in a variety of writing documents, including lab and project reports. Miley *et al.* presented a Studio Model used to assist undergraduate electrical engineering students with improving their technical writing skills through assignments and Writing Center facilitators [6].

Moving to writing among graduate students, Colwell *et al.* investigated writing challenges among graduate students of engineering and technology disciplines [7]. The authors observed that most graduate students are not well-equipped in writing skills to produce effective scholarly writing even if they might have had technical writing experience in their undergraduate curriculum, and recommended that faculty members or mentors provide guidance and feedback in scholarly writing. Students should also be provided with appropriate style manuals, including those for proper citation, to either targeted journals or other expected writing products [7]. More recently, Daignault and Morse introduced another "Writing in the Discipline" program in the graduate students' particular STEM program to assist them with their dissertation writing [8]. This WRITE-D program allowed students to have a dedicated time and place to get together to work on, improve on, and progress in their writing [8]. Funded by Graduate School, this writing group allowed peer discussions and interactions, as well as presentations by facilitators on a variety of writing topics [8]. This small group environment for dedicated writing is similar to the Writing Sessions described in our paper, but without the limitation of disciplines, or the type of writing.

The importance of writing beyond graduate school has long been recognized by multiple groups so much so that several institutions have incorporated writing related workshops and programs for faculty [13]-[17]. Most of these efforts, though focused on writing engagements and improving writing competencies, are centered on peer writing communities. For instance, "Writing in Engineering Faculty Fellows" program described by Brown *et al.* brought together

different engineering faculty fellows to ultimately develop and write an instructional toolkit that would incorporate effective writing and communication within the undergraduate technical curriculum [13]. Garton and Deckard developed workshops and seminars to assist early career faculty to effectively write competitive proposals to federal-level new investigator research grant programs [14]. Their work focused on a career development plan, education plan, and other strategic components of a proposal that integrate research and education through an innovative research project. The authors also described institutional support for faculty in planning and writing such proposals while developing the faculty's grant writing skills [14]. Litzinger *et al*. organized a workshop for engineering faculty to assist them in writing effective evaluation and dissemination plans for their proposals [15] which are significant for effective proposal writing. Kresta *et al.* report on workshop findings, though specifically targeting graduate students, that would benefit faculty as well: The authors summarize tips for effectively turning research into a dissemination product and ensuring co-authorship through appropriate contributions [16]. The team's contributions are valuable in that they promote working collaboratively and determine co-authorship and individual contributions to a research manuscript ahead of time, besides writing productively, effectively, and well. While each person must write individually, the authors state that social contexts help improve writing and writing products, including "maintaining momentum and excitement" [16].

The work presented here represents a culmination of a multi-year effort to assist dissertators in their path to academic and related careers through their individualized plan developed through the Texas A&M System AGEP Alliance, and specifically focuses on the Writing Sessions organized in the last three years that began as Job Preparation and Search thrust of the model.

Texas A&M System Research Model (TxARM)

Through multi-institutional collaborations, Texas A&M System Research Model (TxARM) AGEP Alliance sought to develop and implement a new model for advancing Underrepresented Minority (URM) STEM doctoral candidates as they progressed in their career goals [17]. AGEP, or Alliances for Graduate Education and the Professoriate, is supported by the National Science Foundation to "implement strategies that increase the number of historically underrepresented STEM faculty and promote systemic change" and "foster the growth of a more capable and diverse research workforce" [18]. Participants included women and men who are either African American, Hispanic American or Native American and who are majoring in different STEM fields. To support participants as they (ideally) transitioned from dissertator to postdoctoral scholar to faculty, this "research model" provided participants with professional development opportunities deemed paramount to successful academic careers. The integrated social science research component aimed to address the effects of stigmatization on male and female adults who are non-STEM and STEM African Americans, Hispanic Americans, and Indigenous [19].

URM STEM Learning Community and Community Building

One thrust of the "research model" is related to communication, writing, networking, and job preparation/transition. Oftentimes, URM students are at a disadvantage when they are in the beginning stages of their graduate or early career. They are missing out on the social and/or

cultural capital of academia and/or industry, some due to limited number of peers or role models who share similar experiences and paths in academia. URM students may not have access to the same connections, networks, knowledge, and or skills that non-URM students have. Improving a student's social and/or cultural capital can increase persistence, reduce isolation in their respective fields, and promote resource access needed to succeed [20], [21]. Programs such as the TxARM STEM Learning Communities are targeting URM students to provide personalized, iterative, and community-based settings where they can thrive and meet the next steps in their STEM careers. This is in line with scaffolding academic preparation with community-building practices.

Current academic practice tends to facilitate the siloing of individuals within the "ivory tower". This practice disproportionately harms underrepresented students. Creating a network of inter-discipline STEM doctoral candidates across four universities built a virtual hub of support, professional development, and community. The Writing Sessions that are the focus of this article, which started with the participants' recommendation, were timely, particularly during the COVID-19 shutdown, with most of the world turned to remote/online practices in education. Online writing environments, particularly during the shutdown, further emphasized the importance of community building during isolation and the level of productivity among graduate students and higher education scholars during that time [22], [23].

Methods

Community Writing Sessions: As part of the cohort's Job Preparation activities, community writing sessions were envisioned as a way to build community and perseverance during the writing process, while making strides towards writing goals. These sessions were held weekly during the academic semesters to promote an iterative process that encouraged participants to write often for one dedicated hour.

In the initial stages of the writing community, the cohort members consisted of both dissertators and postdoctoral researchers. These weekly writing sessions started with an alternating focus on grant writing and developing academic job application packages. Each session began with brief socializing and general check-in. Then a formal introduction to a key component to that week's focus was followed by goal setting for the writing portion of the session. Participants would work on relevant funding opportunities, if writing a grant proposal, or specific job postings, if applying for an academic position.

Writing Topics

During first year of Writing Sessions, grant writing topics included biosketches, one-page summaries, budget and justification, aims, funding agencies, persuasive writing, and others as relevant to the targeted agency.

Preparation for academic job applicants included sessions on seeking out academic job postings and the development of teaching statements, research statements, cover letters, diversity statements, and decoding position descriptions. These sessions also included information on types of institutions (R1, R2, MSI, HSI, etc.) and how those differences would come to bear in the preparation of an academic application package. Deference and care were given to discipline specific expectations, but foundational elements were thoroughly discussed.

During the second year, as the cohort members progressed on different paths towards their academic career goals, the writing sessions became more informal, targeting individual needs. Again, sessions began with welcoming the cohort members and quick check on each participant's goal for the writing session. Weekly writing sessions captured writing for grants, journal selection, research manuscripts, dissertating, peer review, response to reviewers' and editor' comments, cover letters, teaching/research statements, diversity statements, patents and others as needed. The cohort members enjoyed writing individually but at the same time with their community.

During the third year, as the cohort members accepted academic positions, the focus shifted to targeted grant writing. Specifically, NSF and NIH funding opportunities were discussed, especially highlighting programs with an early career focus. Participants were exposed to the structure and aims of these large agencies in order to increase the competitiveness of their proposals and increase resilience of URM academics in their current positions and beyond. As previously, other writing products were also addressed based on participants' needs.

Informal Evaluation and Realignment of Expectations

Periodically, interests and needs were solicited verbally at the end of the writing sessions and via email. Feedback was largely collected informally through brief conversations with the participants and anecdotal information passed on from cohort members. Surveys were conducted centrally with the AGEP Alliance to reduce the time burden on the cohort members, and included aspects of the project beyond the writing sessions.

Findings from Evaluation and Feedback Data

While varied between sessions based on interest and availability, average participant attendance was three cohort members per session, with some sessions seeing up to six cohort members joining in. A total of seven cohort members have participated on and offline throughout the start of the writing sessions. Other cohort members preferred one-on-one sessions with the moderator for editing and other writing recommendations.

Cohort members worked on proposals, conference papers, journal articles, manuscript revisions, response to editor and reviewers, patents, and faculty and postdoctoral position application packages, among other writing tasks. Some cohort members received writing-related assistance offline outside the writing sessions. Figure 1 summarizes all writing activities the cohort members anecdotally shared that they worked on during years 1, 2 and 3 both during the community writing sessions and offline. Some of this data includes information from cohort members who were unable to join the writing sessions real-time, but who sought feedback offline.

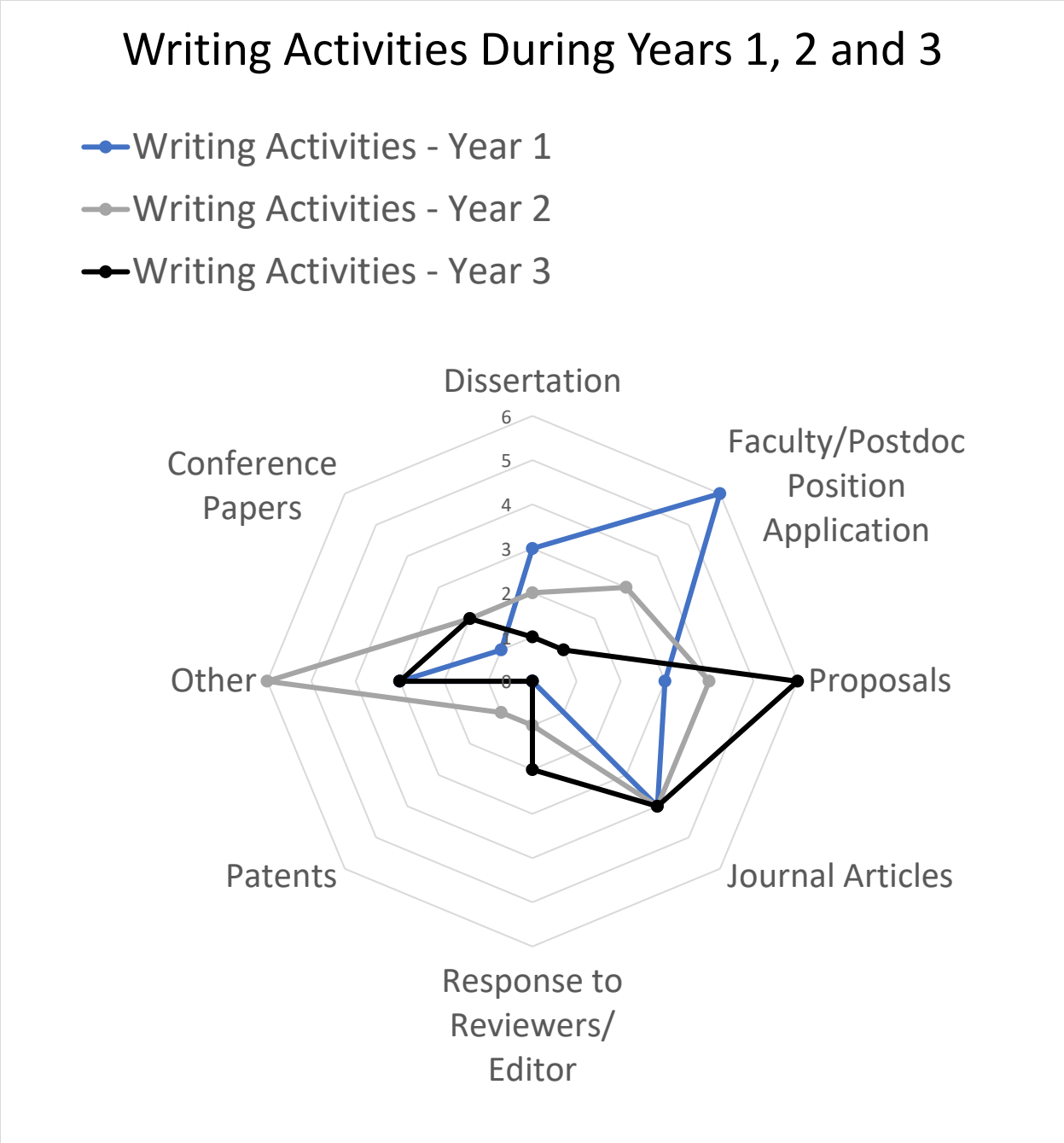

Figure 1. Representation of writing activities in Year 1 (n = 7)

Based on feedback from participants, a range of scholarly products were addressed. Cohort members engaged in more than one writing activity, both during the writing sessions and outside.

- Notably, during the first year all participants indicated spending time on their academic position application package during and outside the writing sessions. As the figure shows, the number of cohort members working on postdoc or faculty position applications went down from year 1 to year 2 and year 3 as the cohort members were offered postdoc and faculty positions at one or more institutions of higher education.

- All respondents worked on journal publications for multiple years. Some of the cohort members noted that their journal submissions have already resulted in accepted and subsequently published products.
- Respondents worked on grant applications, with one participant focusing on developing multiple funding proposals during the writing sessions, several of which were selected for funding. Proposal writing activity among cohort members increased from year 1 to year 3 as they moved forward in their academic career path and as expected. These proposals varied in their target sponsorship, ranging from internal, private to federal level funding sources.
- One participant worked and submitted a patent application during second year.
- During the first year, some cohort members continued to work on their dissertation, mostly outside the writing sessions. The number of cohort members working on their dissertation dropped as expected as these participants completed their degree.
- Participants indicated they were working on response to editor/reviewers as they received feedback on their journal submissions.
- Conference papers represented a writing activity the members engaged in, mostly outside the live writing sessions.
- Participants noted that they worked on other writing products as well outside the writing sessions.

All respondents indicated that the community writing sessions were of benefit to completing the scholarly products noted above. The writing sessions were viewed as a community coming together and was meaningful beyond the writing accomplishments during the sessions.

Cohort Member Reflections and Lessons Learned

Writing for Academic Job Applications

The following represents reflections and lessons learned from a cohort participant who participated in the academic job application portfolio preparation writing sessions and other off-line writing activities. Writing sessions and off-line revisions with the activity leader also encouraged the cohort member to dig deeper into other references on creating portfolios on job applications [24]-[27].

Preparing a job applications portfolio is a critical and effective measure in the job search process. A portfolio showcases the applicant's skills, experience, and qualifications to potential employers, providing evidence of the candidate’s suitability for the job. Here are some basic steps to follow when preparing an effective job application portfolio:

1. Research the company and position: Before starting to put together the portfolio, research the organization and position for which you are applying. This will help tailor the portfolio to the specific needs and requirements of the employer.
2. Identify the job requirements: It is imperative to carefully read and understand the job obligations for the position of interest. This will help customize the portfolio to highlight your relevant skills and experience.

3. Determine the required materials: Decide what materials to include in the portfolio. This may include a CV, cover letter, reference letters or list of references, work samples, certifications, and awards.
4. Choose the work samples carefully: Select work samples that are relevant to the position. Choose samples that demonstrate skills, accomplishments, and experience. Ensure work samples are professional, well-organized, and visually appealing.
5. Organize your portfolio: Organize your materials in a way that is easy to navigate. Consider using dividers, tabs, or a table of contents to make it easy to find the needed information.
6. Proofread and edit: Review your portfolio to eliminate errors, inconsistencies, and formatting issues. Make sure everything is accurate, current, and appealing.
7. Submit your portfolio: Submit your portfolio along with your application materials, as applicable. Ensure you follow the appropriate instructions for submitting your application materials.

A well-crafted job application portfolio can help the candidate to stand out in a competitive academic or other job market, increasing the chances of being selected for the position. It is important to take the time to carefully curate one's materials and showcase the relevant skills set and experiences in the best possible way.

Academic Writing and Writing as a Community

The following include reflections from the cohort members who have participated in Writing Sessions:

"Writing sessions were important for me personally and professionally. The cohort became my close group of friends who I look to for support in my career and in my life. These writing sessions let me see and/or hear their voices (at the very least) which is always refreshing. These sessions helped me find a protected time to write undistracted on my academic job applications, journal article edits, and at least 3 grants, one being the prestigious NSF CAREER award."

"Despite being the only one working on a patent application, the writing sessions helped me improve my productivity through a community sense of support and accountability, and through mutual skill building. The sense of support from my peers in similar positions benefitted my time management by dedicating specific times to working on writing. The regular check in times focused my efforts each hour into reportable progress metrics, which helped the patent progress according to the timetable I'd set. The community of writers in the sessions also kept each writer accountable for making reportable progress during the sessions, which ensured that measurable progress was made each session and made participation a good return on time invested in the group.

Beyond the writing session's sense of community, the writing sessions also helped build concrete skills. Writing session attendees also worked together on evaluating work and sharing lessons learned to help each other improve. In my case, patent writing drew a great deal on

technical writing and figure production, and I was happy to be able to share what I learned from the writing sessions with other attendees in order to make us all better technical writers."

"The community writing structure offered accountability and … feedback on material."

"One clear and obvious benefit [of the writing sessions] is the interdisciplinary group we can get feedback from about a certain topic (in real time) during summary/wrap-up. A less obvious one is that many of us looked forward to our writing times and, in a way, they made the writing process more enjoyable."

"It was important to not feel alone in what could be construed as trudgery, especially when many of our writing products could be unsuccessful. We were able to share experiences, which not only built our knowledge base, but also build comradery. It was also a source of constructive accountability. A non-judgmental environment for our writing struggles, and a supportive group that shared our successes."

Conclusion

The URM cohort members indicated that although the writing sessions were only one hour, getting together as a group and writing as a community was very valuable for them. Even if the progress in the allotted time was limited. Further, the debrief at the close of each one-hour writing session, where participants shared their successes and challenges, helped reinforce a sense of accomplishment.

Writing as a URM community proved valuable in not only increasing the quality and capacity of academic and professional writing, but also increased confidence and agency for many cohort members. Beyond writing for their own individual needs, working with their URM cohort community – whose common goals and experiences gave them shared purpose and passion – served to motivate, support and a boost morale for most participants.

A community of dissertators and postdocs who participated in weekly Writing Sessions has evolved into a group of academicians five of whom are in faculty positions, one is a postdoctoral researcher, and one is in an academic non-teaching position. and including 4 faculty members, 2 postdocs, and a research scientist at the time of this publication. As cohort participants attest, writing in community attributed to their resilience in the academic job market.

A community of dissertators and postdocs who participated in weekly Writing Sessions and those who sough one-on-one assistance on writing offline have evolved into a group of academicians six of whom are in faculty positions, one of whom is a postdoctoral researcher, and one is in an academic non-teaching position at the time of this publication. As cohort participants attest, writing in community attributed to their resilience in the academic job market.

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References

[1] P. Parker, "Effect of Type of Writing Instruction on Quality of Student Writing," *Proc. 2009 ASEE Annual Conference & Exposition,* pp. 14.515.1 - 14.515.9, Austin, TX, USA, 14-19 June 2009. Doi: 10.18260/1-2—5665 (Available: https://peer.asee.org/5665)

[2] A. Bandyopadhyay, "Writing in the Discipline, A Case Study in Construction Management," *Proc. 2006 Annual ASEE Conference and Exposition*, Chicago, IL, June 16-21, 2006, pp. 1-8. Doi: 10.18260/1-2--131. (Available: https://peer.asee.org/131)

[3] L. Mayo and K. Wheaton, "Writing and Engineering – Perfect Together," *Proc. 2022 ASEE Annual Conference and Exposition*, Minneapolis, MN, 26-29 June 2022. pp. 1-13. (Available: https://peer.asee.org/40443)

[4] B. Richards and I. Milanovic, "Partnership Between Engineering and Professional Writing," *Proc. 2010 ASEE Annual Conference and Exposition*, Louisville, KY, June 20-23, 2010, pp. 1-16. Doi: 10.18260/1-2--15926 (Available: https://peer.asee.org/15926).

[5] C. D. M. Andrews, M. Mehrubeoglu and C. Etheridge, "Hybrid Model for Multidisciplinary Collaborations for Technical Communication Education in Engineering," in *IEEE Transactions on Professional Communication*, vol. 64, no. 1, pp. 52-65, March 2021, doi: 10.1109/TPC.2020.3047313.

[6] M. Miley, T. Kaiser and L. Kovalchuk, "Improving the Teaching and Learning of Writing through the Writing Studio Model," 23-27 July 2018, pp. 1-10. Doi: 10.18260/1-2--30637 (Available: https://peer.asee.org/30637).

[7] J. L. Colwell, J. Whittington and C. F. Jenks, "Writing Challenges for Graduate Students in Engineering and Technology," *Proc. 2011 ASEE Annual Conference & Exposition*, 26-29 June 2011, pp. 22.1714.1 - 22.1714.13. Doi: 10.18260/1-2--18722 (Available: https://peer.asee.org/18722).

[8] J. Daignault and A. Morse, "Writing in the Discipline (WRITE-D): A new approach to graduate student writing success," *Proc. 2022 ASEE Annual Conference & Exposition*, Minneapolis, MN, 26-29 June 2022, pp. 1-18. (Available: https://peer.asee.org/40981)

[9] F. Berry and P. Carlson, "Integrating Writing Using Calibrated Peer Review (Cpr), *Proc. 2003 ASEE Annual Conference*, 22-25 June 2003, pp. 1-13. Doi: 10.18260/1-2--1159 (Available: https://peer.asee.org/11597).

[10] S. Conrad, W. A. Kitch, T. J. Pfeiffer, T. R. Smith, and J. V. Tocco, "Students Writing for Professional Practice: A Model for Collaboration Among Faculty, Practitioners, and Writing Specialists," *Proc. 2015 ASEE Annual Conference and Exposition*, Seattle, WA, 14-17 June 2015, pp. 26.1432.1 - 26.1432.19. Doi: 10.18260/p.24769 (Available: https://peer.asee.org/24769).

[11] T. L. Larkin, "Inclusive Writing: Pre- and Post-COVID-19," *Proc. 2021 ASEE Virtual Annual Conference*, *26 July 2021*, pp. 1-19. Doi: (Available: https://peer.asee.org/37316).

[12] V. M. Jovanovic, D. Tombolato-Terzic, D. P. Richards, P. Pazos, Megan McKittrick, Julia Romberger, and O. Popescu, "Developing a Faculty Learning Community to Support Writing across Different STEM Disciplines," *Proc. 2017 ASEE Conference and Exposition*, Paper id: 19747, 2017. (Available: https://peer.asee.org/28130)

[13] J. Brown, Ellen Lauchnor, M. Miley, C. Pew, B. Shirley, S. , A. Phillips, "Work in Progress: Writing in Engineering Faculty Fellows," *Proc* Wettstein. *2022 ASEE Annual Conference and Exposition*, June 26-29, 2022, pp. 1-11. (Available: https://peer.asee.org/40827)

[14] L. Garton and L. Deckard, "Support for Faculty Writing Proposals to New Investigator Programs," *Proc. 2009 ASEE Annual Conference and Exposition* Austin, TX, June 14-17, 2009, pp. 14.1100.1 - 14.1100.11. Doi: 10.18260/1-2--5024 (Available: https://peer.asee.org/5024).

[15] T. A. Litzinger, S. E. Zappe, M. J. Borrego, J. E. Froyd, W. Newstetter, K. L. Tonso, and P. N. Van Meter, "Writing Effective Evaluation and Dissemination/Diffusion Plans," *Proc. 2011 ASEE Annual Conference and Exposition*, Vancouver, BC, pp. 22.1715.1 - 22.1715.21. Doi: 10.18260/1-2--18994 (Available: https://peer.asee.org/18994).

[16] S. M. Kresta, J. A. Nychka and R. Graves, "Writing Well^2: Building Traction and Triumph into Co-Authorship," *Proc. 2011 ASEE Annual Conference and Exposition*, 26-29 June 2011, Vancouver, BC, pp. 22.1716.1 - 22.1716.10. Doi: 10.18260/1-2--18726 (Available: https://peer.asee.org/18726).

[17] M. Mehrubeoglu, K. Kelly, S. Walton, R. Richardson, K. Butler-Purry, and S. King, "Academic Job Preparation for Underrepresented STEM Dissertators, Postdoctoral Researchers, and Early Career Faculty: Contributions to an Institutional Partnership Model for Promoting Diversification of the Professoriate," *Proc. 2022 Annual ASEE Conference and Exposition*, Minneapolis, MN, 26-29 June 2022, pp. 1-12. (Available: https://sftp.asee.org/4169).

[18] *Alliances for Graduate Education and the Professoriate (AGEP)*, National Science Foundation, 2021. (Available: https://beta.nsf.gov/funding/opportunities/alliances-graduate-education-professoriate-agep) (Last accessed: 26 February 2023)

[19] Social Sciences Research, Texas A&M System Research Model AGEP Alliance (Available: https://agep-txarm.tamu.edu/About/Social-Sciences-Team) (Last accessed: 1 March 2023)

[20] S. M. Ovink and B. D. Veazey, "More than 'getting us through:' A case study in cultural capital enrichment of underrepresented minority undergraduates," *Research in higher education*, *52*, 370-394, 2011.

[21] C. A. Smith, H. Wao, G. Kersaint, R. Campbell-Montalvo, P. Gray-Ray, E. Puccia, J. P. Martin, R. Lee, J. Skvoretz, and G. MacDonald, "Social capital from professional engineering organizations and the persistence of women and underrepresented minority undergraduates," *Frontiers in Sociology*, *6*, 671856, 2021.

[22] U. Chakma, B. Li, and G. Kabuhung, "Creating online metacognitive spaces: Graduate research writing during the COVID-19 pandemic," *Issues in Educational Research*, *31*(1), 37-55, 2021.

[23] A. M. Koulaxi and J. Kong, "Re-thinking virtual writing retreats in the Covid-19 higher education environment," *Journal of Applied Learning and Teaching*, *5*, 12-19, 2022.

[24] M. Kimeldorf, *PORTFOLIO POWER: The New Way to Showcase All Your Job Skills and Experiences*. Princeton, NJ: Peterson's, 1997.

[25] F. Steigerwald, *Portfolio development: Documenting the adventure.* Counseling Today, vol. 4, no. 5, p. 30, Nov. 1997.

[26] B. Fowler, “How to Build a Work Portfolio,” June 2022. (Available: https:/www.linkedin.com/pulse/how-build-work-portfolio-get-hired-by-linkedin-news/)
[27] A. Simmons and J. Lumsden, *Preparing a Portfolio*, The Career Center, The University of Florida, pp 1-4. (Available: https://career.fsu.edu/sites/g/files/imported/storage/original/application/14ff67753b55c2199e46480a800a9a5b.pdf)