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Creating a Supportive Space for Teaching-Focused Faculty to Write About their Teaching

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Dr. Thomas is an Instructional Assistant Professor in the Department of Computer Science and Engineering at Texas A&M University. She is a member of the Engineering Education Faculty in the Institute for Engineering Education & Innovation at Texas A&M. She enjoys project-based learning and incorporating active learning techniques in all her courses. She received her Ph.D. from Texas A&M University in 2010, focusing on developing robotic motion planning algorithms and applying them to computational biology problems including protein folding. She continued this work as a Postdoctoral Research Associate and then as an Assistant Research Scientist until transitioning to teaching. She has also worked as an algorithmic consultant in digital oral care, leveraging her research experience in modeling motion.

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Charles Patrick Jr. is a Professor of Practice in the Department of Biomedical Engineering, Texas A&M University (TAMU). He is also a teaching and research fellow at the Institute for Engineering Education Innovation, TAMU and a member of the Engineering Education Faculty, TAMU. He has worked in higher education for more than 30 years at state and private universities and a NCI comprehensive cancer hospital.

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Pauline Wade was formerly the assistant director for the Craig & Galen Brown Engineering Honors and Grand Challenge Scholars programs. Previously, she was a tenured faculty member at the University of the Philippines, Cebu (UP), in the Department of Computer Science. Wade has over 25 years' experience in the software industry working in a variety of environments, starting with working as a systems engineer for AT&T Bell Laboratories Government Systems and the AT&T Wireless Network group. After AT&T she started an IT consultancy working on a diverse set of projects including enterprise-wide systems development, business process re-engineering, software quality systems certification and software related training development. She served as the assistant vice president of a major IT outsourcing and offshoring company for Southeast Asia, heading the employee development program and development of company-wide systems. Wade established the UP-Technology Business Incubator (TBI), the only operational university based TBI in the Philippines, including developing a training program for over 60 tech start-ups. She was nominated for the Department of Science and Technology Outstanding Technology - Commercialization Award for contribution to technological development. The TBI continues to operate and was awarded the 2017 UP President's Excellence in Public Service Award. She also established the first UP IT Training and Development Center in the region, which offers continuing education programs to IT professionals. She has facilitated strong collaborations among academe, industry and government, deploying 28 capability building programs to help prepare more than 3,000 undergraduates for industry.

Ms. Donna Jaison, Texas A&M University

Donna Jaison is a PhD student under Dr. Karan Watson in the Multidisciplinary Engineering Department at Texas A&M College Station. She is a Graduate research assistant at the Institute of Engineering Education and Innovation(IEEI) at Texas A&M University under director Dr. Tracy Hammond. She completed her MEng. in Computer Engineering with specialization in VLSI from Texas A&M University, College Station. She completed her Bachelors in Electrical Engineering with a Minor in Mathematics from Mississippi State University.

Dr. Janie M Moore, Texas A&M University

Dr. Janie McClurkin Moore is an Assistant Professor in the Biological and Agricultural Engineering Department at Texas A&M University in College Station. A native of Columbus, Ohio, she attended North Carolina A&T State University where she received a B.S. in Bio Environmental Engineering in 2006. She then began pursuing her graduate education at Purdue University in the Agricultural and Biological Engineering Department, completing her Ph.D. in 2015. Her primary research areas include 1) social capital in Engineering Education and 2) innovate instructional strategies for Biological and Agricultural Engineering students. She is also a Member of the Engineering Education Faculty, Institute for Engineering Education and Innovation, Food Science Graduate Faculty, and Multidisciplinary Engineering Graduate Faculty groups at Texas A&M University.

Mr. Lance Leon Allen White, Texas A&M University

Lance White is a Ph.D. student at Texas A&M University in Interdisciplinary Engineering with a thrust in Engineering Education. He is working as a graduate research assistant at the Institute of Engineering Education and Innovation at the Texas Engineering Experiment Station at Texas A&M University under director Dr. Tracy Hammond. Dr. Karan Watson and Dr. Pavel Tsvetkov are his co-chairs. He completed his M.S. in Nuclear Engineering at Texas A&M University under Dr. Yassin Hassan working on experimental thermal hydraulics, and completed his B.S. in Mechanical Engineering at West Texas A&M University.

Randy Hugh Brooks, Texas A&M University

Howdy,

After 23 years in Telecom building LD, internet, and email platforms and networks, I observed that the front line personnel that I was hiring didn't have what I considered to be skills that they should be bringing to the table. I began investigating why, and that led me to high school.

Alas, I began my journey in Education in 2010 inhabiting the classrooms of Lovejoy High School, where my two daughters attended.

I redubbed my PreCalculus course as Problem-Solving with Brooks and was also afforded the opportunity to lead an impactul Project Lead the Way (PLTW) Principles of Engineering (PoE) course, a project-based learning survey of the engineering discipline.

Since the Summer of 2015 I have been privileged to work with the Texas A and M Sketch Recognition Lab (TAMU SRL) to evaluate a couple of online tutorial tools (Intelligent Tutoring Systems (ITS)) currently under development, Mechanix and Sketchtivity, that provide immediate constructive feedback to the students and student-level metrics to the instructors. I presented on this work at the state and national PLTW Conventions and at CPTTE in 2016.

I also spent 5 semesters beginning the Fall of 2015 taking online courses learning how to construct and deliver online courses. This resulted in a MSEd from Purdue University in Learning Design and Technology (LDT).

This widely varied background prepared me well for my next big adventure. Beginning in August 2018 I became the Texas A and M Professor of Practice for the Texas A and M Engineering Academy at Blinn

College in Brenham. Texas A and M Engineering Academies are an innovative approach to providing the planet with more Aggie Engineers.

I am focused on enhancing the high school through first-year college experience and am an engaged member of the Texas A and M IEEI (Institute for Engineering Education and Innovation).

My foundations were set by an upbringing on the family ranch near Joshua, Texas and 4 memorable years at Texas A and M where I met my wife, I led Bugle Rank #7 in the Fightin' Texas Aggie Band (Class of '86 Whoop!), and dove into Telecom Engineering. Once in Telecom, my learning continued at MCI, Vartec, and Charter.

Samantha Ray, Texas A&M University

Samantha Ray is a Computer Engineering PhD student at Texas A&M University. Her research focuses on creating intelligent systems for tasks that require human-like levels of understanding. She has previously worked on human activity recognition (HAR) systems for promoting healthy habits and educational tools using sketch recognition and eye tracking.

Dr. Karen E Rambo-Hernandez, Texas A&M University

Karen E. Rambo-Hernandez is an associate professor at Texas A & M University in the College of Education and Human Development in the department of Teaching, Learning, and Culture. In her research, she is interested in the assessing STEM interventions on student outcomes, measuring academic growth, and evaluating the impact of curricular change.

Dr. Karan Watson P.E., Texas A&M University

Karan L. Watson, Ph.D., P.E., is currently a Regents Senior Professor of Electrical and Computer Engineering, having joined the faculty at Texas A&M University in 1983 as an Assistant Professor. She is also serving as the C0-Director of the Institute for Engineering Education and Innovation. She has served in numerous roles at Texas A&M University, including: Provost and Executive Vice President(2009-2017), Vice Provost (2009), Dean of Faculties and Associate Provost (2002-2009), Interim VP for Diversity (2009 & 2005-2006), Associate Dean of Engineering (1996-2001), and Assistant Dean of Engineering (1991-2006). Dr. Watson is a fellow of the Institute of Electrical and Electronic Engineers (IEEE), the American Society for Engineering Education, and the Accreditation Board for Engineering and Technology (ABET). Her awards and recognitions include the U.S. President's Award for Mentoring Minorities and Women in Science and Technology, the American Association for the Advancement of Science mentoring award, the IEEE International Undergraduate Teaching Medal, the WEPAN Bevlee Watford Award, the College of Engineering Crawford Teaching Award, and two University-level Distinguished Achievement Awards from The Texas A&M University Association of Former Students—one in Student Relations in 1992 and in Administration in 2010, and the Texas Tech College of Engineering Distinguished Alumni. In 2003–2004, she served as a Senior Fellow of the National Academy of Engineering Center for the Advancement of Scholarship in Engineering Education. Since 1991, she has served as an accreditation evaluator, commissioner, Board of Director, then President of ABET, and is currently Secretary/Treasurer of the ABET Foundation Board of Directors. She has also served as a program evaluator for J.D. programs for the ABA, for universities' regional accreditation for SACSCOC, and for Business Schools for AACSB. She also has served as the Chair of the ECE division of ASEE, the President of the Education Society of IEEE, and the chair of the Women in Engineering of IEEE. She served as the Treasurer and a Board of Directors member for WEPAN.

Creating a Supportive Space for Teaching-Focused Faculty to Write About their Teaching

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Abstract
While research institution publication is driven by tenure track faculty, there are instructional innovations occurring in the first-year classrooms that should be published and shared with the community. Instructional faculty often explore new instructional approaches, yet instructors with multiple classes exceeding 100 students or weekly in-class lecture and lab coverage exceeding 25 hours have little time to reflect, research, and publish on their observations and discoveries. Recently, the extreme instructional demands from pandemic management have heightened the awareness and impact of their contributions as many led the charge through innovation and guidance into the immediate transition to the online environment. Coordination with and recognition through the school's Center For Teaching Excellence organization provided the scholarship for teaching and learning (SoTL) grounding and framework.

In order for faculty to contribute to the SoTL and publish, they must overcome significant barriers including better understanding of the SoTL landscape, creating support systems to sustain them in a typically isolating writing endeavor, and training in meeting the unique expectations of academic writing. We describe several initiatives implemented at Texas A&M University that specifically address these challenges including community building among engineering education faculty, bringing in engineering education leaders to give seminars and discuss the future of engineering education, and several smaller support groups of faculty focused on either engineering education grant writing, designing and implementing innovative teaching methods, or academic writing in general. Instructional and first-year faculty who have participated in these initiatives have submitted and published significantly more than ever before. We share data on the benefits of these initiatives and discuss future directions to support the professional growth of instructional faculty in academia.

Introduction

In Fall 2020, Texas A&M University started several initiatives within its newly created engineering education faculty group to encourage Academic Professional Track (APT) (non-tenure track faculty) and Professors of Practice (PoP) (non-tenure track faculty bringing industry experience to the classroom), to write about their teaching and submit their papers for publication. This initiative includes a significant number of faculty teaching in the first year engineering program and was largely driven by a new IEEI (Institute for Engineering Education

and Innovation) Director in coordination with the school's Center for Teaching Excellence. Pandemic-related teaching conditions created a growing interest among all faculty of the need for implementing proven teaching techniques in their classrooms, and a movement to help peers through sharing and publishing of findings and experiences.

One of the challenges faced by APT and PoP faculty, is their relative inexperience with sharing practices and observations through the publication and conference network, a channel where tenured faculty are experienced. APT faculty have advanced degrees, and PoP faculty may or may not have advanced degrees, however are required to have 15 or more years of professional experience. Both of these faculty tracks focus on teaching, with a secondary focus on either research or service. Although they are not eligible for tenure, they can earn multi-year contracts in the same time frame it takes to earn tenure for a tenure track faculty. The primary expectation of a professor of practice instructional appointment is to incorporate their industry experience into their lessons to provide a bridge between theoretical topics learned in the classroom to application of these topics as a professional engineer.

The benefits of writing and publishing manifest in two key areas. APT/PoP faculty must delve into the area of scholarship of teaching and learning (SoTL) as they gather references and explore opportunities related to their writing, thereby enhancing their instructional knowledge and skills base that is subsequently applied in their classroom. In addition, publication is seen as an area of strength when constructing their promotion documentation.

As there is a noticeable difference in writing style and audience regarding industry publications and academic venues, there is a need for some coaching to help PoPs transition their writing skills to the academic space. Writing groups providing a model for scholarly writing has been effective for some faculty, however some may benefit from more structured training, such as writing classes and other professional development venues.

Related Work

I. Communities of Practice

Learning to write and publish scholarly work on teaching is particularly challenging when faculty do not have either experience in disciplinary research or in engineering education research. Even among faculty hired specifically for SoTL work, less than half have formal training in SoTL [1]. A community of practice (CoP) empowers faculty to overcome these hurdles by placing them in a social environment or community that supports situated learning [2]. As faculty move from the periphery to the heart of a community, they increasingly identify with that community [3] and undergo lasting transformation through personal experiences over time [4]. When these experiences include critical inquiry and community dialogue, identity transformation and learning take place [5–6].

Often faculty do not have a community where they can generate and discuss SoTL ideas, nor anyone else in their department working in SoTL [1]. A CoP can provide this critical support and network of scholars that SoTL requires [7]. A SoTL CoP can also facilitate regular peer review of each others' on-going work [8].

Successful CoPs have a transdisciplinary composition to naturally facilitate mentoring [9]. Within the CoP, more experienced faculty model best practices in SoTL and provide valuable networking opportunities [10]. These CoPs can also focus on specific issues related to SoTL professional development that more general CoPs cannot [11]. SoTL CoPs can also support members in ways that result in measurable outputs such as peer-reviewed publications [12].

II. Writing Groups

Many faculty, both new or experienced, frequently voice challenges of consistently writing for peer-reviewed publication as the pressure to produce is coupled with the typically solitary nature of writing [13]. To combat this, writing groups are small collections of people that gather frequently to support one another in their writing, either through accountability, peer-feedback, or even collaborative writing sessions [14]. The group's main purpose is to help each other meet their individual writing goals. Thus, goals should be concrete and voiced in the group and members should be committed to the group and each other.

Writing group initiatives possess various benefits for faculty members that go beyond better work-life balance and productivity to retention, promotion, and improved teaching as they become better equipped to fulfill research obligations [15]. These groups emphasize empathy and constructive peer-review [16] . Faculty that participate in writing groups on average publish almost twice as much as faculty that do not [17]. They are also more receptive to criticism from journal editors and reviewers as they have had practice receiving feedback from their writing group.

Methodology

I. Initiatives

The initiatives which provide a supportive environment for faculty include:

1) A weekly research fellows group of 9, primarily APT faculty, that focuses on how to get engineering education research funding and conduct scholarly research,
2) A weekly teaching fellows group of 6, also primarily APT faculty, that looks at designing and implementing innovative activities in their classroom,
3) A weekly meeting with the engineering education faculty as a whole where faculty share what has been successful,
4) A distinguished seminar series by national engineering education leaders who spend time mentoring the faculty in writing about their experiences and discussing the future of engineering education, and

5) A morning writing group where faculty discuss what they are writing and dedicate time for the actual writing, either by themselves or as a group.

II. Participants

The supportive space may be populated with any mix of tenure track mentors, experienced APT/PoP faculty with a history of publication success, and instructional experts with a strong familiarity of literature development on various relevant topics. The participants in these initiatives were mainly APT and first-year faculty. Four of the participants joined Focus group interviews to share their experiences in being part of the writing group.

III. Data Collection and Analysis

In order to determine the benefits of the initiatives and get a deeper understanding of the participant experience, two focus groups were conducted. Focus group interviews examined the following questions:

1) What were your interactions like with your peers in this writing group?
2) How has your writing evolved over the tenure of the weekly writing group?
3) What were some major challenges you faced when developing as a writer in this group?
4) What major outcomes from participating in these initiatives did you find were most beneficial for you as a writer?
5) Do you plan on continuing professional development focused on writing for the purpose of Scholarship of Teaching and Learning (SoTL)?

The focus group interview results of the four participants were collected. The qualitative data was analyzed by an independent researcher to identify repetitive themes among the responses. The responses were then reexamined to identify all occurrences of these themes.

Findings

Initially, participants in the writing groups were unfamiliar with each other. However, during the focus group interviews, they expressed that as they got to know each other, they began to mesh well (Question 1). This stemmed from time to chat with each other before writing sessions and during writing breaks as well as sharing thoughts and ideas about the projects they were working on or other things going on in their teaching. They observed that the community extended beyond writing support and this became *"...a new group of best friends."*

When reflecting upon how their writing evolved over the course of the writing group (Question 2), participants named several areas where they saw improvement in their writing including a clearer understanding of how to present ideas in proposals, pitch proposals in an impactful way in an abstract, greater confidence in conducting a literature review to provide appropriate context for their ideas, and a better grasp of the entire writing process from idea to abstract to draft to published paper. Some participants also worked on writing grants that were later recommended for funding.

The participants in the focus group voiced various challenges based on their diverse backgrounds (Question 3) Two members shared that though they were familiar with writing in industry, writing in academia was challenging due to the purpose of writing being different. Other challenges mentioned include: being vulnerable and sharing thoughts and ideas with peers before it was fully developed, lack of familiarity with literature, and setting aside time in the midst of various other responsibilities.

Despite these challenges, the focus group noted major outcomes that they found to be the most beneficial (Question 4). Many of these centered on the theme of community such as getting to meet experts in the field of writing, seeing how others tackle writing projects, the support of having peers to accompany participants on the writing journey, and even collaboration on writing projects. They also saw that having a dedicated time and community improved their ability to make progress in their writing, improve their refinement, and complete writing projects. Since these initiatives have been started, our APT and first-year faculty have submitted and published significantly more than they did in previous years.

Going forward, all participants said that they plan on continuing professional development focussed on writing for the purpose of SoTL (Question 5). One participant already started collaborating with another writing group, and another participant is interested in joining a structured professional development group in scholarly writing. Participants also mentioned their interest in continuing to know more about the science of teaching and learning, and also in reading and publishing engineering education related research papers.

Discussion

Faculty need support systems as they innovate and publish their contributions to SoTL. The initiatives were successful in creating a collaborative community in which faculty can share ideas, refine their approach, and strengthen their writing skills so they can acquire funding and publish their work. Faculty observed significant professional growth in these areas as they participated in these initiatives. While the supportive environment produced tangible results in terms of an increase in publication from APT faculty, other initiatives that can be considered include, one-on-one mentoring and more structured training in scholarly writing such as taking formal classes.

References

[1] S. Bush, N. Pelaez, J. Rudd, M. Stevens, K. Tanner, and K. Williams, "Widespread distribution and unexpected variation among science faculty with education specialties (SFES) across the United States," *Proc. Natl. Acad. Sci. USA,* vol. 110, pp. 7170–7175, 2013.

[2] E. Wenger, *Communities of Practice: Learning, Meaning, and Identity.* Cambridge: Cambridge University Press, 1998.

[3] J. Lave and E. Wenger, *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press, 1991.

[4] S. Brown, A. Collins, and P. Duguid, "Situated cognition and the culture of learning," *Educational Researcher*, vol. 18, no. 1, pp. 33–42, 1989.

[5] K. P. Cross, "Classroom research: Implementing the scholarship of teaching," *New Directions for Teaching and Learning*, vol. 75, pp. 5–12, 1998.

[6] N. S. Shapiro and J. H. Levine, *Creating learning communities*. San Francisco, CA: Jossey-Bass, 1999.

[7] A. L. Williams, R. Verwoord, T. A. Beery, H. Dalton, J. Mckinnon, K. Strickland, J. Pace, and G. Poole, "The power of social networks: A model for weaving the scholarship of teaching and learning into institutional culture," in *Teaching and Learning Inquiry: The ISSOTL Journal*, vol. 1, no. 2, pp. 49–62, 2013.

[8] S. L. Rowland and P. M. Myatt, "Getting started in the scholarship of teaching and learning: A 'how to' guide for science academics," *Biochemistry and Molecular Biology Education,* vol. 42, no. 1, pp. 6–14, 2014.

[9] C. Wade, "Faculty learning communities and teaching portfolios as a mentoring model," *Academic Leadership Journal*, vol. 2, no. 4, 2004.

[10] H. Hubball, A. Clarke, and G. Poole. Ten‐year reflections on mentoring SoTL research in a research‐intensive university. *International Journal for Academic Development*. vol. 15. pp. 117-129, 2010.

[11] M. Cox, "Faculty learning communities: Change agents for transforming institutions into learning organizations," in *To Improve the Academy,* D. Lieberman and C. Wehlburg, Eds. Bolton, MA: Anker, 2001, pp. 69–93.

[12] P. Dzidic, E. Castell, L. D. Roberts, P. Allen, and M. Quail, "Reflections on the Emergence and Evolution of a Scholarship of Teaching and Learning Community of Practice Within a Research Intensive Higher Education Context," in *Communities of Practice: Facilitating Social Learning in Higher Education,* J. McDonald and A. Cater-Steel, Eds. Singapore: Springer, 2016, pp. 219–239.

[13] M. Eodice and S. Cramer, "Write on! A model for enhancing faculty publication," *Journal of Faculty Development,* vol. 18, no. 4, pp. 113–121, 2002.

[14] J. Jensen, *Write No Matter What: Advice for Academics*. Chicago, IL: The University of Chicago Press, 2017.

[15] D. J. Davis, K. Provost, and A. Major, "Writing Groups for Work-Life Balance: Faculty Writing Group Leaders Share their Stories," *To Improve the Academy,* vol. 30, pp. 31–42, 2011.

[16] N. G. Fassinger and L. L. Johnson, "Benefits of a faculty writing circle: Better teaching," *College Teaching*, vol. 40, no. 2, pp. 53–56, 1992.

[17] M. McGrail, C. M. Rickard, and R. Jones, "Publish or Perish: A Systematic Review of Interventions to Increase Academic Publication Rates," *Higher Education Research & Development,* vol. 25, no. 1, pp. 19–35, 2006.