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Engineering Majors as Generalist Writing Tutors in the UAE: Societal Expectations, Epistemological Dispositions, and Disciplinary Schisms

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Abstract: This study examines the perspectives of engineering undergraduates at an English-medium university in the UAE who serve as writing center tutors. Interviews with four male and four female upper-level engineering-major writing tutors (EMWTs) explored how they interpret their writing ability and their role as writing tutors in terms of their major, their experience at the university, and their prospects as future engineers. This research was driven by our observation that, despite a traditional divide between technical and humanities fields in the MENA region, engineering students had consistently engaged as writing tutors over the years. Findings reveal EMWTs to be engaged, collaborative, and experiential learners with multiple interests who view writing as a tool to enhance their academic and professional standing, positioning themselves as skilled communicators within their discipline. They act as role models, assisting peers in articulating technical knowledge while applying analytical skills from engineering and math to tutoring. Notably, female tutors exhibited greater autonomy in choosing their major and a stronger disciplinary identity than their male counterparts, whose decisions were often influenced by family and schooling limitations. This study highlights the interdisciplinary role of EMWTs,

bridging engineering and writing, and suggests that their experiences contribute to both academic success and career prospects. The gender-related findings, though incidental, indicate a need for further research on disciplinary identity formation among engineering students in the region.

Reflection

Ever since I (Lynne) started training the writing tutors at the American University of Sharjah in 2007, I had considered the engineering-major writing tutors an intriguing population to study, especially given the techno-social divide in our context.¹ Yet, turning this long-term interest into a research project emerged from a commitment made to myself after the IRC 2017 workshop: to return to IRC the following year.

The IRC 2017 workshop had revived a notion held by a younger, more idealistic me: one who had imagined life as an academic engaging with colleagues on exciting research ventures. I felt uplifted by the IRC day-long workshop—enthused by colleagues' fascinating scholarship and the thoughtful attention they gave to my own design-writing research.

Indeed, the IRC workshop was the closest I had come to that ideal since receiving my Ph.D. Academic life had not facilitated such pursuits; teaching large writing courses each semester left little time to collaborate with colleagues. Like many, I coped with publication requirements by cramming research into late and early hours—times ill-suited for the “tête-à-têtes” I had envisioned as a doctoral student.

My IRC 2017 experience prompted me to invite my colleague Maria Eleftheriou, our Writing Center director, to study the engineering-major writing tutors together. A proposal for IRC 2018 was submitted, and, a year later, when I attended IRC 2018 in Kansas City, Maria and I had completed interviews and identified preliminary findings, thus reaching an ideal juncture for engaging with colleagues there.

Indeed, discussion with IRC 2018 participants was as rewarding as anticipated. I keenly appreciated my conversation with Karl-Heinz Pogner, who had studied engineers' problem-solving strategies and negotiations. Our chat prompted reflection on similarities between engineering-style interactions and writing center tutorials. Subsequently, Maria and I began noticing our tutor-participants' perspectives on skill adaptation and transfer between the two endeavors. This became an important part of our findings.

1 Please read the opening statement for this collection, “Editing in US-Based International Publications: A Position Statement,” before reading this chapter.

We know that, like us, many writing professors are so overwhelmed with grading and commentary that collaborative-research ventures are sidelined. Yet, the IRC inspired us to embark on our tutor-research adventure, and for that, we are grateful. When the pandemic further restricted our time and the imposed lockdown prevented us from meeting in person, Maria and I completed this research using Zoom and WhatsApp. Certainly, we are thankful for the online platforms that allowed us to circumvent COVID constraints. Looking back, our resolve to collaborate has made for a rich and memorable research experience that transcended the challenges of time, space, and pandemic. Looking forward, we feel the limitations of the pandemic have broadened our interpretation of and capacity for working with both local and global colleagues: location and time difference no longer figure as prominently as barriers, but we still appreciate the magic inherent in meeting face-to-face. The option for hybridity has made proceeding with future collaborative ventures more attractive and viable, in our estimation.

Institutional Description

The American University of Sharjah (AUS)—www.aus.edu—is a Middle States accredited American university within the emirate of Sharjah, in the United Arab Emirates. Founded in 1997, AUS is one of several universities in Sharjah, but is distinguished by its status as an accredited American university, and the fact that it is the only co-educational campus in the emirate. Currently, over 5000 undergraduates and graduates are enrolled. The university is a multicultural one, represented by students of 70+ nationalities; the top ten are Emirati, Egyptian, Jordanian, Syrian, Palestinian, Indian, Pakistani, Saudi Arabian, Lebanese, and Iranian. The nearly 400 faculty members represent 50 nationalities. AUS houses a College of Engineering (2047 undergraduates), a School of Business and Management (1108 undergraduates), a College of Arts and Sciences (784 undergraduates), and a College of Architecture, Art and Design (654 undergraduates).

The Bachelor of Science degree programs in chemical engineering, civil engineering, computer engineering, electrical engineering and mechanical engineering offered by the College of Engineering are accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org/>). AUS was the first university in the Gulf region and the second outside the United States to receive this accreditation.

Introduction

Engineering educator David Radcliffe describes the successful engineer as

self-aware, emotionally intelligent, empathetic, an active listener and a nuanced communicator with diverse groups, persuasive both orally and in all manner of written styles, trustworthy and collaborative. (Radcliffe, 2017, p. v)

To develop these qualities in engineering students, writing in the disciplines (WID) scholarship has promoted course-based collaborative and interdisciplinary written assignments and projects (Bairaktarova & Eodice, 2017; Hirsch et al., 2001; Poe et al., 2010; Ronesi, 2017). Marie C. Paretti (2011) notes, however, that engineering faculty tend not to adopt these instructional approaches, even when writing is a requirement in their course. Jon A. Leydens and Juan C. Lucena (2018) trace this resistance to “technical-social dualism” within engineering, which serves to overlook “the complex interplays between the social and the technical in engineering and scientific practices” by elevating the technical aspects and trivializing the social components (p. 50).

In the Middle East–North Africa (MENA) region, this disciplinary schism is exacerbated by a pronounced social-status distinction between technical and humanities fields; this division further hinders interdisciplinary cooperation between academic fields (Hodges & Kent, 2017). Attesting to the inimical effects of this schism, regional employers have identified engineering graduates’ writing and verbal skills as problematic (Prescott et al., 2011; Ramadi et al., 2016).

Yet, at the American University of Sharjah (AUS) in the United Arab Emirates (UAE), engineering majors represent a consistent and significant number of the writing center tutors—around 30% every semester since the 2004/2005 academic year—a participation rate second only to the College of Arts and Sciences.

We two AUS writing center practitioners—peer tutor trainer and writing center coordinator—see engineering-major writing tutors (EMWTs) as creative negotiators of this “technical-social dualism” and recognize EMWTs are well-positioned to influence other students’ perspectives. To discern how they understand and negotiate the dynamics of their social and disciplinary realities, we undertook an IRB-approved study, conducting semi-structured interviews with four male and four female EMWTs shortly before their graduation. Our research investigates how EMWTs interpret their role as writing tutors in terms of their learning, their engagement as engineering students, and their disciplinary identities.

This chapter begins by exploring writing-tutor identity and experience as well as engineering-student epistemological identity and sense-making. We lay out our methodology and then present the socio-cultural and institutional

context of the study. Using EMWT voices to discuss regional attitudes and institutional realities, we highlight the tension that manifests when an American-curriculum university offers a general education curriculum to students who have experienced discipline-specific tracking in secondary school (Tétreault, 2011). Also, we address the role of the AUS Writing Center as a support to American-university writing instruction in a superdiverse context, its significance to the EMWTs, and EMWT tutor training and recruitment challenges. Finally, we examine how EMWTs perceive their roles as writing tutors, and navigate their own aptitudes, goals, and epistemological dispositions within societal, institutional, and discipline parameters.

Literature Review

Writing Center Tutor Scholarship

During the past two decades, writing center scholarship has featured calls to investigate the influence of “out-of-writing-center” tutor identities and experiences on tutoring (Dinitz & Kiedaisch, 2003; Geller et al., 2007). Responses to these calls question long-held metaphors, assumptions, and orthodoxies regarding the tutoring experience (DiBiase, 2016; Fallon, 2010; Watson, 2012). Siobahn T. Watson (2012) addresses the disparities between tutorial identity and writing center discourse and training, noting that tutors who do not fall within established narratives may experience dissonance and feel compelled to sublimate aspects of themselves that fall outside discursive orthodoxy. Brian J. Fallon (2010) and Christopher J. DiBiase (2016) examine tutor perception of tutoring through Edward Soja’s framework of spacial epistemologies, theorizing the writing center as a “thirdspace” where tutors’ motivations, emotions, and lived experiences as well as “acknowledged and unacknowledged social and institutional forces” drive their work (Fallon, 2010, p. 179). DiBiase notes that tutor agency is an important factor for overcoming the writing center’s physical [firstspace] limitations or discursive [secondspace] orthodoxy and suggests that careful recruitment and training attract tutors with the requisite investment and agency to make writing centers “spaces for struggle, liberation, [and] emancipation” (citing Soja, 2016, p. 68). Flexible practices with firstspace and secondspace aspects of the writing center—i.e., encouraging tutors to take ownership of the physical space to enhance the tutoring experience or enabling them to use their judgement in tutoring even if their choices defy the scholarly discourse—foster tutors’ investment in their work. The latitude to call upon “discourses, values, and practices from non-writing center spaces” (DiBiase, 2016, p. 251) allows the tutors to make epistemological sense

of their tutoring and to understand the out-of-writing-center impact on their own lives and the lives of those they tutor. Such scholarship has re-conceptualized the understanding of tutors and raised questions about their training.

Engineering Student Education

Similarly, engineering pedagogy is evolving from earlier orthodoxy, aiming to restructure the traditional techno-centric engineering curriculum towards a sociotechnical, or heterogeneous, approach. To re-orient engineering pedagogy, studies have sought guidance from engineering practice (see Stevens et al., 2014) and have highlighted communication, non-technical, and contextual competencies important for engineering: negotiation and dialogue (Kastenberg et al., 2006; Pogner, 2003); adaptive expertise transfer (McKenna, 2014; Poe et al., 2010); global competency (Downey et al., 2006; Kastenberg et al., 2006; Leydens & Lucena, 2018); and social justice ethos (Cumming-Potvin & Currie, 2013; Leydens & Lucena, 2018).

A challenge to this evolution is integrating these competencies while maintaining the rigor of the traditionally content-heavy engineering curriculum. A popular response is introducing “wicked” or ill-structured problems into the engineering curriculum (Crickenberger, 2017; Jonassen, 2014; Lönngren, 2019; Stevens et al., 2014). Replacing the customary exercise of solving “well-structured problems” that have neat parameters and established solutions, “wicked problems” involve ambiguity and conflicting values and have a variety of possible and untidy solutions. Wicked problems aim to extend engineering students’ problem-solving repertoire, introduce real-life considerations, and develop adaptive expertise “particularly relevant in the domain of engineering, where design problems by their nature are ambiguous and complex, and almost always require knowledge integration from a range of sources, disciplines, and perspectives” (McKenna, 2014, p. 230).

In addition to real-world engineering applications, scholarship has explored engineering student culture and identity (for meta-analysis on engineering campus cultural identity, see Tonso, 2014). Despite research support for heterogeneous approaches to engineering curricula, engineering campus culture continues to perpetuate the idea of the technicist engineer (Leydens & Lucena, 2018; Stevens et al., 2014). Investigating technicist-oriented engineering students and heterogeneous-oriented engineering students in group design projects, Karen L. Tonso (2006) noted that technicist students applied a reductionist approach to the work, privileging “manipulating decontextualized, mathematical abstractions central to academic science over the application of scientific knowledge to real-world engineering dilemmas

[used by heterogeneous students]” (p. 292). On the other hand, heterogeneous students in group projects drew on the knowledge gained from their personal interests—often ones affiliated with the engineering realm, contributed non-technical information, utilized social skills to enhance teamwork, and emphasized group success over their own, even while using approaches in line with actual engineering work and contributing more to the project’s success. Nonetheless, students and faculty in this study considered the technician engineering students as ideal engineers; heterogeneous engineers—whose contributions were often backgrounded—were less well-regarded.

There is concern that a technician-oriented campus culture misrepresents the epistemological needs of real-world engineering and forces out potentially excellent engineers who cannot reconcile their heterogeneous epistemological dispositions with traditional engineering curricula (Danielak et al., 2014). Noting that epistemological framing varies with content and context, David Hammer et al. (2005) and Andrew Elby and Hammer (2010) suggest students should learn to vary their sense-making approaches depending on content or learning activities.

On the other hand, Benjamin D. Geller et al. (2014) suggest that a perceived clash between students’ sense-making preferences and disciplinary epistemology can have positive implications. For example, students’ frustration with a discipline to which they remain committed may lead to a search for options within the field that better accommodate their sense-making preferences. Another consequence is that students’ interdisciplinary sense-making becomes strengthened. This happens when students encounter out-of-discipline learning which matches their sense-making preferences and then realize the epistemologies associated with a particular discipline can be used for sense-making in another—i.e., using free-writing strategies learned in composition class to better grasp a mathematical concept. Once students realize that sense-making can cross disciplinary boundaries, they not only become open to adopting those strategies but also understand that knowledge and insights from other disciplines can be useful in understanding their own specialization.

Methodology

In Spring 2017, our proposal to study EMWTs was approved by the AUS Institutional Review Board (IRB). The study was conducted over the course of two semesters; the participants were EMWTs who had tutored at least two semesters and were in their last semester prior to graduation. Gender was not a selection criterion; while fortuitous, the gender balance was not surprising as it has been customary among EMWTs.

The eight EMWTs represented the variety of nationalities typical of the AUS student population: Bulgarian, Canadian, Egyptian, Iraqi, Jordanian, Pakistani, Palestinian, and Syrian; a few had dual nationalities (See Table 9.1). Six EMWTs were raised in the UAE while two were raised in nearby countries. To ensure the EMWTs’ anonymity, we have used pseudonyms and omitted identifying details.

Table 9.1 EMWT profiles

EMWT	Gender	Origin	Major
Ruba	Female	Levantine	Chemical Engineering
Noor	Female	North African (Grew up in the UAE)	Computer Science
Razan	Female	Levantine (Grew up in the UAE)	Chemical Engineering
Jowana	Female	Levantine/European (Grew up in the UAE)	Civil Engineering
Ahmad	Male	Subcontinent	Computer Science
Omar	Male	Gulf (Grew up in the UAE)	Mechanical Engineering
Mustafa	Male	Subcontinent (Grew up in the UAE)	Civil Engineering
Bilal	Male	Subcontinent (Grew up in the UAE)	Mechanical Engineering

All EMWTs spoke heritage languages other than English in their homes and with friends. While all attended English-medium secondary schools, their curriculums differed as per these EMWT descriptions: “supposed to be an American system,” “Pakistani public school based on British curriculum,” “American curriculum which is modified for the region,” “community school for South Asians [that] followed the British curriculum.”

The EMWTs were sent emails inviting them to engage in an hour-long semi-structured interview in our offices at the end of their final semester. Our interview questions were informed by the scholarship on writing tutors and engineering students and reflected our understanding of the significance of the societal and institutional context on our EMWTs. As such, we formulated interview questions to understand how the EMWTs had situated themselves within these contexts as both negotiators and mediators of the cultural technical-social dualism. The beginning of the interviews focused on their pre-university experience. We began by eliciting their accounts of the curriculum and instruction

at their secondary schools and the EMWTs' academic strengths, hobbies, and interests at that time, with attention to their sense of their families', peers', and educators' perception of and influence on their trajectories. EMWTs were then asked to share their experiences with university writing instruction and engineering instruction, with attention to critical experiences in both sets of courses as well as factors leading to their selection of major. This was followed with questioning on how the EMWTs learned about tutoring at the writing center and understood their peer tutor training course, with discussion on critical or illustrative incidents characterizing their perceptions of themselves as EMWTs. The last part of the interview addressed how the EMWTs connected the two realms: the intersection between their engineering knowledge and writing tutor knowledge and the EMWTs' perceptions of their writing center experience as significant to their success as engineering students and to their identities as future engineers.

The interviews were audio-recorded, then transcribed. We listened to and read the transcripts separately, independently generated codes, then met to review each interview, honing our coding as we worked through each of the interviews to draw our conclusions. While initial coding mostly reflected our own understanding of the EMWTs, iterative reading of interviews and resulted in more complex coding. For example, "multifacetedness" was employed early in our coding to highlight a characteristic we had long observed in our EMWTs. Noting how EMWTs discussed this characteristic in their interviews, we realized "multifacetedness" was associated with "out-of-writing-center" tutor identities which was addressed in the writing tutoring literature and to "heterogeneous orientation" which was addressed in the engineering education literature. Our coding was thus refined and helped us understand this characteristic's role in the EMWTs' identity and epistemological dispositions.

Once complete, this chapter was returned to the eight EMWTs for member checking; all eight confirmed our interpretation represented their perspectives and resonated with their experiences.

Regional Attitudes and Institutional Realities

In the UAE, even senior engineering positions can rank below comparable positions in finance, marketing, banking, law, and medicine in terms of basic wages and allowances (Maceda, 2016). Nevertheless, engineering continues to be a revered profession throughout the Middle East and Subcontinent—regions of origin for many in the largely expatriate UAE workforce. This inclination towards engineering is represented in the university curricula of the Gulf Arab States (Miller-Idriss & Hanauer, 2011) and appears linked to

what Shafeeq Ghabra and Margreet Arnold (2007) identify as “[traditional] thinking of strict employability within fields of study” (p. 12), which leads to valuing professional programs of study over social sciences and humanities. Moreover, this emphasis is consistent with current efforts in the UAE to guide the economy toward knowledge-based models featuring science, technology, and engineering (Aswad et al., 2011).

In this context, American-curriculum universities—characterized by their liberal arts and communication focus—face the challenge of accommodating the regional preference for professional studies (Tétreault, 2011). This negotiation is evident at AUS, an independent, English-medium American university with four schools/colleges: the College of Architecture, Art, and Design; the College of Arts and Sciences; the School of Business Administration; and College of Engineering.

Accredited by the Middle States Commission on Higher Education, AUS boasts a well-developed general education curriculum that requires students to take roughly one third of their credits in liberal study courses spanning history, culture, literature, arts, and social/behavioral sciences. In keeping with the regional inclination, nearly half of AUS undergraduates are enrolled in the College of Engineering pursuing degrees in Mechanical Engineering, Computer Science, Computer Engineering, Industrial Engineering, Civil Engineering, Electrical Engineering, or Chemical Engineering.

While the large number of engineering majors is congruent with the MENA context, the choice of an engineering major may not reflect students’ aptitudes and personal inclinations. In this region, choice of major is often a family—not an individual—decision (Aswad et al., 2011) and EMWTs acknowledge engineering tends to be the default major for many. EMWT Ahmad provides some humorous insight on the perspectives of families in his community:

So you can go to your parents and say “Mom, I really want to try out theatre” and they’d be like, “But what about mechanical engineering? Why don’t you give that a shot?” So the [question parents have about all] the other majors, is, as we say [in Urdu] *kya koro gay iska?* (what would you do with that?) So, the idea is if you do engineering, you will, like, after one month of graduation, get a job, but if you do something like theatre or liberal arts, what will you do? Will you be a professor? And these [notions] are there in society.

Accordingly, while the perceived prestige of an engineering degree from an American university may attract students and their families, they may not

understand or appreciate the American curriculum's focus on liberal arts and communication. The first-year academic writing instruction, specifically, is a source of much student anxiety, particularly as, coming from a variety of secondary curriculums (i.e., in addition to American and British, Arabic, Indian, Iranian, Pakistani, Russian, etc.), many AUS students were not introduced to writing as a medium of learning in their schooling. In fact, in some of these schools, English is not the medium of instruction, and even in many English-medium secondary schools, academic writing may not have been addressed. Reflecting on her secondary writing instruction in an account consistent with other EMWTs, Jowana recalls, "[My school was] supposed to be an American system [but] I never learned what a thesis statement means. We had writing, but writing was like, 'what did you do over the summer?' in one page; no structure, nothing. I didn't know there was a huge gap between the way we were writing [in school] and the way we write here [at AUS]."

Some EMWTs link the lack of emphasis on—or rigor in—writing instruction to the early discipline-specific tracking common in regional schools, noting that, in their schools, science and the less prestigious business tracks were the only viable options for academically-inclined students:

My personal interest was in English but [my school] didn't have anything related to it. If you want to appear for the English course, English as a second language was the only [option]. So, the only two choices I had were science and commerce. Because I was getting good grades in maths and sciences, my teachers were like, "You are a good student. You should go for science." So, I was like, "What about commerce?" [My teacher] was like "That's for the weak students." Yes, it may sound a bit funny, but that was the answer that I got. (EMWT Bilal).

Consequently, many AUS students have little or no experience with writing instruction in English and find their first-year writing courses quite daunting—particularly, the application of critical thinking to their reading and writing assignments, source-based argumentation, and adherence to academic integrity requirements. Their struggle in these courses, their unfamiliarity with the communication-based goals of an American curriculum, and their inability at this early stage to appreciate the role of writing in their disciplines can engender much student resentment about the writing courses in the curriculum (Bilikozen, 2015). This is particularly the case with many engineering students. EMWT Noor describes many students' attitudes as "I'm here to study engineering only. I have nothing to do with English."

The EMWTs also identify as a prevalent AUS-student assumption the idea that engineering students are unable to write. Ahmad recalls a student at the writing center almost refused to work with him: “Because she knew I was a computer science major, she’s like ‘Wait, you’re going to be the one tutoring me?’ And I could see from her face she was not satisfied [with being tutored by] a computer science major.”

The Writing Center

In step with typical American-university approaches to supporting writing, a writing center was established soon after AUS’s inception. Eleftheriou, upon assuming responsibility of the Writing Center in 2004, introduced a generalist peer-tutoring model with undergraduate tutors. The following year, AUS added a writing fellow program—where peer tutors assist students in their writing assignments in writing-intensive courses across disciplines—and a semester-long peer-tutoring course required for employment in the Writing Center.

Since then, the AUS Writing Center has been a site of research for theorizing writing center pedagogy for the linguistically- and culturally-diverse students in the UAE. These investigations, undertaken with tutors and students, have addressed the Writing Center practices: Eleftheriou’s (2011; 2019) stimulated-recall study on tutorial practices; research on online tutoring (Eleftheriou, 2013; 2015); the importance of offering formal tutor training courses for peer mentors and tutors (Eleftheriou, Al-Dawood et al., 2022); the examination of the Gricean cooperative principle as a peer-tutor training tool (Eleftheriou, Spyropoulou et al., 2022); evaluation of the training course (Ronesi, 2009), the writing fellows’ support (Ronesi, 2011a, 2017), the impact of multilingualism on the tutors (Ronesi, 2011b); and, currently in-process, code-switching in tutorials. Sharing this research at nearby and international conferences, often along with the tutors, has brought recognition to the AUS Writing Center as a regional leader.

The Center’s reputation, staff, and usage grew, and in 2012, the Center was allotted a large open-concept room adjacent to the AUS library. Tutors decorated the Center with colorful art and posters of literary figures and quotations on writing. Prior to the pandemic which has forced the AUS Writing Center to operate online only, the tutors kept the whiteboards updated with writing tips, sketches, and wry commentary. In this cheerful space, tutors often remained outside of their shifts to collaborate on various projects such as writing contests, the newsletter, social media promotion, and classroom workshops. Also, a private area in the back of the Center provided tutors a place to work on their own assignments or rest between classes.

Training and Recruitment

As noted above, a credit-bearing peer-tutor training course prepares undergraduates for a generalist tutoring model. The course curriculum was designed to help tutors-in-training to bridge the gap between the AUS context and the context assumed in the mostly North American-based course readings. One goal of the training course is to elicit trainee awareness of both personal and locally-oriented writing challenges as a springboard for approaching their tutorials. While dialogue journals, a tutoring practicum with reflections, and a locally-relevant research project help support this course goal, class discussion is seen as integral for its attainment (for greater detail on the theoretical underpinnings of the training course, see Ronesi, 2009). Even as most trainees initially feel discomfort at voicing their perspectives on course content, they come to acknowledge its importance to their development as tutors and as individuals, as EMWT Razan explains:

The person I am now—I can just start a conversation with anyone, anywhere, anytime. I wouldn't be this way if it wasn't for the writing center. If it was left for the university to break my bubble that I was in, it would have not worked. Because, in the writing center, I was kind of forced. Even in the [training course], we had a lot of discussions. Actually, this was the first class [in which] I had discussions in the class. Like before, it was all math courses. Everyone sits alone. I didn't work in groups before that course, as far as I remember. So, [in] the course itself, we had to speak up. [There were] points [allotted] for participation. So this pushed me out of my comfort zone somewhat.

While Razan was clear on the benefits of the tutor-training class and tutoring in the Writing Center, like five of the eight EMWTs, she did not join the class in the standard fashion, which is through professor recommendations. Each mid-semester, we ask writing faculty to identify “strong writers who demonstrate diligence, accountability, and interpersonal skills.” Recommended students are emailed an invitation to join the tutor-training class the following semester. Non-recommended students like Razan and the male EMWTs can join the course if space is still available after recommended students enroll. Razan was encouraged to enroll by the writing fellow assigned to her chemical engineering course who recognized Razan as a strong and engaged writer. The four male EMWTs were encouraged to enroll by writing tutor acquaintances who seemed better positioned than the four's writing

professors to appreciate their potentiality as tutors. We address the issue of recruitment in the discussion section.

The EMWTs

Secondary School and First-Year Writing

EMWTs reported doing reasonably well in writing and English in secondary school but characterized their assignments as simple. Even EMWTs who felt challenged by writing were not particularly daunted, like Noor who “never [felt as] strong as [she] hoped to be ... but again, was focused on maths and physics.” Writing was not considered a high-stakes skill by the EMWTs, their schools, or their parents. Ahmad recalled “[My parents] had heard from my teachers [that] ‘He’s okay but he’s not as good as some,’ so they had made their peace with the fact.”

Still, EMWTs felt motivated by their first-year writing courses at AUS. In those courses, writing became process-oriented, and the focus on argumentation and source-based writing suited them more than the expressive writing assigned in secondary school. The first-year writing courses revealed their latent writing abilities and constituted a pivotal step in their writerly identity:

[A]s I became stronger and had more vocabulary, more ideas, a better way to form sentences, [I realized] I like doing this. I like writing. I wanted to do well because of my [previous] low expectation. So that’s how it started. (Noor)

Paths to Engineering

Even as EMWTs came to appreciate writing in their first year, they did not consider majoring in fields traditionally associated with writing. Their accounts indicate that the trajectory to studying engineering had been established early in their lives. However, the distinctions in the ways male and female EMWTs chose their majors both highlight and complicate assumptions of gender and vocation in this region.

For the female EMWTs, the path to studying engineering had been determined by personal interest and aptitude in their teens, a finding resonant with regional scholarship demonstrating genuine interest in STEM subjects by female engineering majors (Aswad et al., 2011; Hillman & Salama, 2018). The female EMWTs were committed to their majors, expressed an aptitude and passion for STEM subjects from their teen years, and anticipated studying at the post-graduate level. Ruba, Noor, Razan, and Jowana were active members

of engineering clubs and organizations; they sought opportunities to collaborate with engineering professors and to participate in their research projects. Moreover, they envisioned careers at the managerial level and in academia.

Ruba's love of the sciences led her to her major: "Through my childhood, I loved the sciences—specifically chemistry, physics, and math. The major that combines them is chemical engineering." She expressed enthusiasm at the prospect of "designing a process ... to produce something from raw materials into something that's usable." Ruba was applying for jobs, and hoped, after a while, to apply for master's degree programs in environmental engineering. Ruba's family was supportive of her decision to major in engineering and to pursue her career in terms of jobs or further education. Ruba's father, also an engineer, had provided guidance throughout her undergraduate years.

Noor, a computer science major, reported being "more left-brained—more math and science side" as a teenager, and cited math as her favorite subject in secondary school. She enjoyed her major courses, particularly "the ones with labs and projects, and stuff where you actually get to code." While acknowledging the stigma associated with humanities majors in the Middle-East, Noor reported that her family would have supported any choice of major. When interviewed, Noor had been accepted into a master's program for applied computing at a North American university. She planned to focus on graph theory, artificial intelligence, and machine learning. Eventually, Noor hoped to get a PhD and felt "inclined towards teaching and working in an academic environment" citing its flexibility in terms of specialization.

Razan reported an early interest in science: "We did chemistry in grade eight, and this is how it started." She had been interested in majoring in chemistry, but her parents discouraged her: "[Y]ou'll end up being a school-teacher, just teaching chemistry. So how about engineering?" Emphasizing employment opportunities and high salaries, a family friend convinced Razan and her parents that chemical engineering was most suitable. Razan eventually realized that engineering is "more of the application, not the science itself. And I happen to like this more, actually." Just before our interview, Razan had been accepted into a regional master's degree program in the biomedical field and intended to research drug delivery.

Jowana's preference and aptitude for physics led her to a civil engineering major. However, Jowana's parents, unlike those of Ruba, Noor, and Razan, did not appreciate her choice: "They were like, 'You're a girl, why would you go into engineering? You're very good at public speaking; why don't you go into media?'" Indeed, recognizing her communication skills positioned her for success in administration, Jowana had recently declared a minor in engineering management. Jowana envisioned pursuing a graduate degree abroad

in the future: "I'm going to finance it myself, so I'll have to get a job first."

Although most male EMWTs claimed they were comfortable with their choice of major, they did not relate their selection to an early and prolonged interest in STEM subjects. In comparison to the female EMWTs, the male EMWTs' choice of study appeared less intrinsically motivated and more propelled by social parameters, curricular limitations, and family expectations. While their accounts indicated they dedicated great effort to their major courses, their engagement in their major seemed less pronounced; no male EMWTs discussed discipline-based extracurricular activities or research projects with professors. Also, the males demonstrated more ambivalence about an engineering-career trajectory.

Ahmad's strengths in secondary school were math and physics. A computer science major, Ahmad had never considered pursuing any degree other than one in engineering, pointing out that his secondary school offered only two career tracks: science or business: "So engineering or business: it's like the other [disciplines] don't exist at all." Ahmad had enjoyed his major courses, particularly the self-driven learning his projects entailed: "I am enrolled in five online courses at the moment, learning five different technologies, mostly for my senior project and one of my courses, the internet application development course." Ahmad had recently accepted a software documentation position with an international company.

Like Ahmad, Omar was restricted in secondary school to science or business so he chose the scientific track, taking chemistry, physics, and biology. As Omar was uncertain what to study at university, his parents suggested engineering: "For my parents at least, it ties into notions of prestige in [our country]." Omar mused, "I don't think [engineering] was an incorrect choice. I think an engineering route gets me more financial opportunities in the future. Is it what I want to do my entire life? I don't know. The reason I gravitated towards transportation planning is because it is not just number crunching. You have to take urban fabric into account, so that's sociology. You have to take into account the environment; you have to take into account what people think. So that's why I gravitated towards that." At the time of his interview, Omar was negotiating employment with the transportation agency where he had interned.

Mustafa chose mechanical engineering partly out of practicality and partly to distinguish himself in his family, none of whom were engineers. While he was most drawn to graphic design, photography, and visual media, he felt that these fields were unlikely to offer him financial stability. In secondary school, he had studied physics, chemistry, and mathematics. "[Mechanical engineering] felt kind of a better option.... I like cars a lot. So, this was, like,

the only engineering field that I could relate to.” Acknowledging the design element in mechanical engineering, he concluded mechanical engineering “overlapped with his interests.” Still, Mustafa was ambivalent about becoming an engineer: “I’m not really serious about getting a mechanical job after graduating. I would prefer a job that’s more hands-on but I wouldn’t mind [any] work, as long as it’s a field that I have some interest in.”

Unlike the other EMWTs, Bilal had a strong interest in English during his secondary years; however, he had no opportunity to pursue English as he, like Ahmad and Omar, was limited to science or business in secondary school. He opted to study chemistry, math, and physics, which he did not enjoy. Seeing university as a way to return to his love of English, Bilal expressed his hope of pursuing an English major with the goal of teaching. However, his parents objected: “If you are a teacher, you stay a teacher. There’s no career progression in that.” Bilal recounted, “My whole family was sitting with me when I was filling in my [university application] form and they told me, ‘Go for engineering.’” Bilal applied himself to his mechanical engineering courses but was disappointed by his performance. He was anxious about the effect of mediocre grades on finding engineering jobs in the short-term until he was able to enroll in a Master’s degree in linguistics or literature. Bilal’s goals were to obtain a PhD and, eventually, a position as a university professor.

These EMWTs are gifted students not only in engineering and in written communication but also as multilingual individuals negotiating the superdiverse context that characterizes many Gulf states (Hillman & Eibenschutz, 2018; O’Neill, 2017). This exposure to the cultural and linguistic diversity within their locales, schools, and, often, their families has positioned them as globally competent (Ronesi, 2011b). Given recent calls for globally-proficient engineers (Cumming-Potvin & Currie, 2013; Downey et al., 2006; Leydens & Lucena, 2018), we surmise that the EMWTs’ attributes qualify them as desirable candidates for engineering positions globally.

While acknowledging the EMWTs’ potential as future engineers, we authors have sought to explore the EMWTs’ experience as undergraduate writing center tutors. Acknowledging the technical-social schism pervading engineering and societal attitudes, we note that the EMWTs have fought against the current to integrate their personal and professional aspirations into their university experience. Their choices underscore our need to better understand them—to learn how EMWTs “move through writing center spaces, [bring] different writing practices from outside the center into their tutoring work, and ... [take] some of the work of tutoring with them when they finished their shifts and went about their days” (DiBiase, 2016, p. 46).

Findings

Negotiating the Terms of Learning

In their interviews, EMWTs express their desire to develop their various interests and aptitudes in their personal, academic, and professional lives. EMWTs see the Writing Center as an adaptive environment (Loi & Dillon, 2006; Poe et al., 2010) where identity, epistemology, and affect interact, and where, as writing tutors, they can position themselves to engage in heterogeneous approaches to learning: “[the Writing Center] is where I learn, and this is the basis on which I plan to look into the future” (Bilal).

For EMWTs, the Writing Center constitutes a context where their heterogeneous-orientation to learning and their “out-of-writing-center” identities and experiences are validated. EMWTs see themselves and the other tutors as multifaceted and appreciate the resulting easy camaraderie among them—a rapport not always possible with acquaintances from their majors.

[T]here is no restriction [on topics we tutors might discuss amongst ourselves]. You don’t feel like “I’m not a part of this” or this person doesn’t understand me, because in the Writing Center, you get the sense everyone knows about everything you’re talking about. (Mustafa)

Multifacetedness is also perceived as valuable in tutorials, as Noor notes:

You have to be open or have the general knowledge to discuss with students and [advise] them: “Alright, have you read [about] or heard that there’s this—I don’t know—new political movement? So maybe you can argue about that, or there’s this and this.” So, for you to be a successful tutor, you have to be diverse in your thinking. [It’s] not “I’m only good at English so I can edit.” No. There’s also discussion that goes on, brainstorming.

Tutoring encompasses a broad learning experience for which EMWTs can draw upon their values, personal interests, lived experiences, and understanding of institutional and social norms. These “out-of-writing-center” identities allow them to be mediators for other students who need support crossing boundaries. Sensitive to the politics and history of the region, Omar seeks to support students who might feel resistance to expressing themselves in English: “How can I make [students] feel comfortable writing in this language ... when their [grandparents and] parents have been telling them stories about the colonial era?” Razan, familiar with the challenges of

visually-impaired individuals, provides dedicated assistance to students with visual disabilities. Bilal is the “go-to” tutor for the students on his cricket team and members of his cultural club. Mustafa employs his design skills for the writing center newsletters, posters, and social media needs. Moreover, EMWTs find tutoring gratifying—“it’s really nice to be able to help someone, especially with something that you’re not just good at but you really like” (Ahmad)—and they credit tutoring for gains in self-confidence and interpersonal skills.

Using Heterogeneous Competencies in Mediating Others’ Learning

Hands-on learning in both engineering group projects and writing center conferences prompt EMWTs to engage in heterogeneous sense-making, an adaptive competency that they then share with the students they support in both domains.

Problem solving, according to Ruba, connects her role as an engineering student, future engineer, and writing tutor. Her description of tutoring sessions is suggestive of engineering instruction’s “wicked problems” with numerous variables interacting to pose a challenge—a challenge, as Noor notes above, going far beyond editing. As Ruba explains, tutoring draws on multiple abilities: “fitting your work within a time limit, dealing with the situations of people that you’re tutoring, difficult linguistic skills, plagiarism issues, [students] who don’t want to be in the Center. You develop the skills to deal with these.”

EMWTs note that the skills developed in their roles as engineering students and writing tutors get adapted to and transferred between the two domains—sometimes in surprising ways. Jowana describes mediating for the members of her engineering group by drawing on the facilitative approach she was introduced to as a writing tutor to resist the tendency of one person to commandeer engineering group projects.

You know, [these individuals act] like “the big engineer boss” and, it always clicks, “remember [the] facilitative approach [of tutoring]” and I [will say to them], “You’re very directive. You need to be more facilitative. You don’t just impose your opinion on the entire classroom.” So, I’ve suggested every group [member] pick one idea or project or thought that they want to contribute. I feel we need to understand that everyone’s opinion on our project matters. I think that has really benefited me in engineering projects.

Razan depicts an interesting circular trajectory of heterogeneous sense-making as she discusses the relationship between approaches used for engineering study and writing tutorials. As she begins her explanation, Razan claims implementing an engineering-prompted systematic approach has helped her be a more effective writing tutor.

Engineering taught me to be organized. In engineering, with an application of an idea, of a theory, you cannot do step two without doing step one. And I think this started to affect my writing as well, especially when I brainstorm ideas. [Now] I tend to write on the side, like an outline with numbers. So, when someone comes [into the writing center] and they want to brainstorm ideas, we do it in a list form and sub-lists. I tell them, "Put it in numbers so it's easier for you, so you can tell to put this before this, so it makes more sense."

As Razan continues, she describes using this approach to support her peers in her engineering courses for which she credits her writing center experience.

Now, if a fellow chemical engineer asks me a question in a major course, when I tell them the answer, I put it in steps. And I got this [approach] from [my work in] the Writing Center, so it, just like, works this way.

Like Razan, many EMWTs report drawing on approaches they attribute to their engineering training. Jowana describes how she breaks down student writing into components: "Whenever their intro is [only] two lines long, here's what needs to be done. Number one: hook. Number two: elaborate on topic. So, I create this, like, engineering chart [for] what the introduction should look like." Ahmad and Noor, the two computer-engineering EMWTs, recount adapting coding problem-solving strategies to the writing dilemmas their students face in the Writing Center. Noor explains approaches she uses in both coding and writing tutoring:

It's the same logic in a way: your code isn't working. Okay, let's backtrack. Your sentence doesn't make sense. Okay, let's break it down. What do you want to say? And same with programming. Okay, what do you want the output to be? Or what do you want the program to do?

Similarly, Ahmad acknowledges the overlap: "I think that really helps at the Writing Center." And like Jowana, Ahmad makes use of diagrams in his

own engineering work and writing—and as a visual aid to support student understanding of structure and flow in tutorials.

EMWTs engage in interdisciplinary sense-making and play a mediator role by sharing those competencies with students they support.

Supporting Fellow Engineering Students

While the Writing Center follows a generalist peer-tutoring model whereby EMWTs tutor students of all majors in writing assignments across the disciplines, EMWTs find gratification tutoring students with engineering assignments. EMWTs are pleased when their understanding of engineering-related concepts and discourse conventions can support engineering writing. Ruba is not daunted by the technical topics engineering students bring to the tutorials and is touched by their relief when she understands their topics: “Since I’m an engineer, I’m helping engineering [majors]. And I enjoy it.” Mustafa notes students who need to write in technical language value his engineering background and his ability to determine “[if the writing] makes sense in terms of scientific concepts.”

Yet, that disciplinary support extends beyond EMWTs’ facility with engineering content and discourse. Omar, mindful of the technical-social schism, perceives his disciplinary contribution to engineering students in affective terms. He notes “a lot of the time, the engineering students have been better writers than other students I’ve worked with,” an observation he regularly shares with engineering majors to encourage them: “I convey that it’s fine that you’re an engineer; it doesn’t really mean you’re destined to be a worse-off writer than everyone else here.” Having previously considered himself a weak writer, Ahmad empathizes with engineering students, wants to help them to recognize their potential as effective writers, and in fact, has made a practice of recommending particularly strong writers he encounters to the tutor training class: “So when I see someone like that, generally these are people who are in their freshman or sophomore year, so I see someone who is exactly like [I was].” While Jo Mackiewicz (2004) establishes that tutors who have engineering-specific experience are more effective than general tutors at supporting engineering writing, our study demonstrates EMWT assistance for fellow engineering students can also extend to the affective realm—in this case, from concerns that consider institutional and social norms.

Distinguishing Themselves Within Their Discipline

The EMWTs’ heterogenous approach and their roles as boundary-crossers have placed them in highly beneficial positions. Their writing skills and their

association with the Writing Center are perceived as singular strengths which are acknowledged and appreciated by fellow engineering students, their professors, and prospective employers.

EMWTs note that their engineering courses require written assignments and their professors reward good writing with higher grades. This not only bolsters their own grades but also makes EMWTs desirable on project teams as they provide their groups a competitive edge: “I basically end up doing the bulk of the report-writing when it comes to group projects and lab reports. It is a plus [my group members] count for me” (Omar).

Jowana attributes her inclusion into a prestigious engineering honor society over “friends with higher GPAs” to her role as a writing tutor: “Writing Center gets you that!” For Razan, an interview with a professor about joining his research turned in her favor once she mentioned she was a writing tutor: “He was like, ‘You know what? You’re in! I’ll have to get you into my research group.’”

Omar’s writing skills were “a big plus” during his internship. “There was an appraisal and [my supervisor] mentioned [my research and writing skills] as a really big plus, and he told other people we were working with that I was good at what I was doing so they should give me work to do.” Ruba and Ahmad mentioned their positions as writing tutors were noted during recent job interviews. Ahmad observed, “They were pretty impressed by the fact that I work at the writing center. It’s not very common.” Rather counter-intuitively in this techno-centric context, the EMWTs’ willingness to incorporate writing into their engineering identities distinguishes them from their engineering peers.

Discussion

This study exploring EMWTs’ interpretation of their writing tutor roles in terms of their learning, their engagement as engineering students, and their disciplinary identities was undertaken through a writing-center lens. Noting that contextual cues determine the saliency of identity and epistemological beliefs (Elby & Hammer, 2010), we understand that collaboration with engineering colleagues—or even conducting interviews in the engineering building—may well have elicited different student perspectives.

We acknowledge the limitations engendered by our positionality not only as writing center practitioners but as individuals who were raised in North America and attended universities shaped by a liberal arts approach. Neither of us has access to the communities of the EMWTs nor speaks their heritage languages. To address the potential biases and preconceptions implicit in this situation, we

used EMWT voices in developing the context and explaining our findings and engaged in member-checking once the chapter draft was completed.

In engineering education research, we were excited to find themes similar to those in writing tutor scholarship. These themes center around reconsidering earlier pedagogical orthodoxies; valuing heterogeneous competencies and various epistemological approaches in negotiating content and problem solving; and integrating the knowledge gained from “out-of-context” identities, lived experience, and social and cultural context into student learning. Indeed, we feel the frameworks in engineering education literature have a lot to offer writing tutor scholarship. More generally, our study affirms the immense potential inherent in interdisciplinary connections between the writing center and engineering department.

Regarding the AUS context, our findings demonstrate that these EMWTs, who had experienced discipline-specific tracking in their high schools, greatly benefitted from the American-curriculum focus on liberal arts and communication. In particular, our tutor training and writing center space provided EMWTs the latitude for an adaptive environment to flourish. The EMWTs were able to support their epistemological inclinations—as well as their social, prosocial, and professional aspirations—through their tutoring. However, our investigation highlighted deficiencies in our recruitment strategies. Because writing professors teach students across the curriculum, we had considered writing faculty recommendations to be a discipline-neutral approach to recruitment. Yet, we learned through our EMWT interviews that this recruitment strategy neglects engineering students. Over the past five years, writing professor recommendations had accounted for only 35% of EMWT enrollment in the tutor training course, as opposed to roughly 60% of non-engineering tutors. Why this occurs is an important issue to pursue in a future study.

The EMWTs’ perspectives suggest a tutor-driven recruitment strategy should be formalized alongside recommendations from our writing faculty. A tutor-driven recruitment committee can join the ranks of the newsletter, social media, and writing contest committees. All tutors should see recruiting new tutors as part of their role, with recommendations from tutors treated just as recommendations from professors—followed up with an email invitation to join the training course. Further, EMWTs should be encouraged to promote the writing center in their departments. As engineering professors require written assignments and value strong writing, EMWTs can identify engineering professors who might encourage their students to use the writing center and even recommend strong writers for tutor training. Given contextual constraints, engineering faculty are likely more receptive to the initiatives introduced by their students than by faculty in other departments.

These proposed measures are commensurate with the findings of this investigation. Given their investment in their writing tutor roles and their cognizance of the effect of the techno-social schism on their and other students' lives, EMWTs are persuasive advocates for interdisciplinary cooperation between the writing center and engineering departments.

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Glossary

Accreditation Board for Engineering and Technology (ABET): An accreditation body for postsecondary engineering programs (not for entire institutions). An accreditation by ABET means that the engineering program of a particular institution has been deemed as meeting a high standard of quality with regards to students, curriculum, faculty, administration, facilities, and institutional support. This accreditation lasts for 6 years. (<http://www.abet.org/>).

English-medium instruction: instruction that takes place in English in non-Anglophone settings like Europe, the Middle East, and Asia where it is a growing trend at the postsecondary level

First-year Writing/Composition (FYW/FYC): a fundamental part of American-university curricula, first-year writing courses generally introduce first-year students to academic writing with emphasis on critical thinking, rhetorical strategies, audience, purpose, genre, and source-based writing. This introduction should lay a foundation for discipline-based writing in upper-division courses.

Middle East-North African (MENA) countries: Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, West Bank and Gaza, and Yemen

Sharjah: one of the seven emirates (like state or province) of the United Arab Emirates. The other six are Abu Dhabi, Dubai, Ajman, Um al Qawain, Fujairah, Ras al Khaimah. All emirates have their distinct qualities. Sharjah is known for its culture (16 museums) and higher education (several universities).

United Arab Emirates: an oil-rich gulf state founded in 1971, characterized

by a very small local population and a large, multilingual, multicultural work force of expatriates. Islam is the official religion, and Arabic the official language, although English, Hindi, and Urdu are widely spoken.

Writing Center: commonly found at universities in the US and Canada but increasingly throughout the world, a venue where students receive assistance on their written assignments from undergraduate peers who have been trained to support them in maintaining structure, clarity, and integrity in their writing.

Writing Center tutor: at AUS, this refers to an undergraduate student who has been trained to support the various students with their writing assignments in any class at the university writing center

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