CHAPTER 7.

QUANTIFICATION OF DISCIPLINARY DISCOURSE: AN APPROACH TO TEACHING ENGINEERING RÉSUMÉ WRITING

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Through this chapter, the authors present a novel approach to quantifying Disciplinary Discourse Density in résumés. The authors demonstrate how, for an engineering context, disciplinary discourse in résumés can be analyzed using the American Association of Engineering Societies Engineering Competency Model, and they translate their research into a pedagogical approach that enables students to quantify disciplinary discourse in their own résumés. This approach facilitates students' ability to reflect on what their rhetorical choices mean for their disciplinary audience, working toward developing a disciplinary identity and communicating that identity via the résumé. The authors' positionality as experts in technical communication and engineering provides validity to the method, which has been employed across multiple contexts to date. The authors extend their approach to multiple pedagogical interventions and make recommendations for instructors teaching résumé writing as part of writing across the curriculum initiatives for any disciplinary community.

The résumé is a common assignment across the curriculum (Melzer, 2014) that presents an opportunity for students to learn how to frame their academic and professional experience according to the expectations of their discipline. Typi-

DOI: https://doi.org/10.37514/PER-B.2020.0360.2.07

cally part of a "job documents" or career unit that includes a range of deliverables such as cover letters, personal websites, or portfolios, the résumé is also frequently taught in introductory technical and professional communication (TPC) courses (Francis, 2018; Melonçon, 2018) that often function as a "'service course'" to other departments (Melonçon & Henschel, 2013, p. 51). Faced with this range of majors, writing instructors may not feel knowledgeable in—nor have the time to learn—specific résumé guidelines of multiple disciplines. Relying primarily on professional writing textbooks for résumé instruction may not be ideal, as students often find this information to be outdated, generic, and irrelevant to their field (Randazzo, 2016). Résumé writing is also a high-stakes task as students often use this assignment to prepare for on-campus career fairs for internships and post-graduate positions.

Despite these challenges, though, we argue that pedagogical approaches to teaching résumés can move away from an adisciplinary focus on form over content (e.g., the use of parallel structure, action verbs, or bulleted lists) and instead adopt writing across the curriculum (WAC) or "writing to learn" and writing in the disciplines (WID) or "learning to write" practices. The latter corresponds to David Russell's (2007) observation that the teaching of TPC courses is "always already the teaching of writing in the disciplines" (p. 248), with instructors of such courses needing to understand "writing to learn and learning to write in a discipline or profession as two sides of the same pedagogical coin" (p. 250). Likewise, in this chapter, we outline a pedagogical approach to résumé instruction that guides students in "learning to write" this genre in a way that models disciplinary discourse and expectations while "writing to learn" how to craft their professional identities.

This approach stems from prior research that studied how the quantification and analysis of disciplinary discourse in engineering résumés can promote strong résumé writing and further students' professional development (Berdanier et al., 2016a, 2016b; Fillenwarth et al., 2018). By "professionalism," we mean the "process whereby a person becomes a participant in conversations within and about a defined discipline" (Pennell et al., 2018, p. 72). The emphasis on "discipline" in this definition is an important one for two reasons. First, a discipline as a "field of practice" includes both "occupations" like medicine, law, and engineering that require legal certification as well as "professions" that do not (Carliner, 2012, p. 51). Second, the term corresponds to our definition of engineering "disciplinary discourse" as "a tangible measure of an engineer's identification with the discipline of engineering" (Fillenwarth et al., 2018).

Saul Carliner (2012) also described professional organizations, bodies of knowledge, education, professional activities, and certifications as common components within the range of "infrastructure[s] of activities that support the

growth of a profession" (p. 51). We describe the résumé as one articulation of these components whose success depends in part on how well students can convey this range of knowledge and experience by adopting the language of their respective discipline. Specifically, we studied résumés in an engineering context both because of the nature of our interdisciplinary collaboration—two of us come from rhetoric and composition and specialize in TPC and the third is from mechanical engineering with an engineering education research expertise—and because engineering students often make up a significant portion of the TPC classes the first two authors teach. The latter point is largely correlated to technical communication's historical beginnings as being a specialized course (often separated from English departments) for engineering students in the early 1900s (Connors, 1982).

Although Russell (2007) stated that the integration of research and teaching within TPC and WID supports professional education through "showing (a) how disciplines and professions construct knowledge and know-how communicatively and (b) how students develop into professionals through communication" (p. 255), he adds that more research is needed in "examining the workplace communication of professionals and the development of students' ability to communicate as professionals" (p. 259). Such research should ideally be interdisciplinary and data-driven with a focus on collaboration between faculty and departments on curricular decisions pertaining to writing (Russell, 2007, p. 270). Our prior studies do not enact the global, departmental collaboration Russell called for, but they still stem from a cross-disciplinary partnership and are supported by empirical data. In this chapter, we focus on the pedagogical applications of this research by outlining classroom exercises involving résumé writing that facilitate undergraduate engineering students' understanding of engineering employers' disciplinary values. We also discuss ways in which these exercises can be adapted for other majors across the disciplines. Ultimately, we argue that such résumé activities can be instrumental in helping engineering and nonengineering students alike critically reflect on and engage in disciplinary discourse practices in the service of supporting their identity development as emerging professionals within their respective disciplines.

INTEGRATING PROFESSIONAL GENRE AND DISCIPLINARY KNOWLEDGE THROUGH RÉSUMÉS

Early research on résumés between the 1970s and 1990s largely focused on the preferences of students, instructors, and employers about résumé preparation and the organization of content (Bird & Puglisi, 1986; Culwell-Block & Sellers, 1994; Harcourt & Krizan, 1989; Hutchinson, 1984; Hutchinson & Brefka,

1997; Penrose, 1973, 1984; Stanley-Weigand, 1991). The rise of digital technologies and the Internet in the 2000s and 2010s precipitated an interest in scannable and electronic résumé writing practices (Barchilon, 1998; Diaz, 2013; Krause, 1997; Roever, 1997), but attention to the "regularities" of the résumé genre such as content, style, and delivery method remains prevalent (Blackburn-Brockman & Belanger, 2001; Martin-Lacroux & Lacroux, 2017; Schullery et al., 2009; Tillotson & Osborn, 2012; Wright et al., 2011). Rhetorical genre studies such as Carolyn Miller's seminal 1984 article, "Genre as Social Action," has also been a popular lens through which to study Web résumés and the rhetorical situations they create through the new exigences, audiences, and constraints of the ever-shifting Web environment (Killoran, 2006, 2009).[1]

Despite this range of research, few studies investigate the rhetorical use of disciplinary discourse within résumés and how such a practice can support the professional identity formation of undergraduate engineering students. Since a résumé is typically a synthesis of students' academic highlights (e.g., advanced courses in the major, senior projects, and academic honors) and workplace experiences (e.g., full-time jobs, part-time jobs, internships, and co-ops), it could be argued that this document *is* an embodiment of the university-to-workplace (and workplace-to university) transition often discussed in WAC literature (Anson & Forsberg, 1990/2003; Dias et al., 1999; Dias & Paré, 2000). By representing the accumulation of the student's noteworthy coursework and projects as well as her prior (and current) workplace responsibilities and tasks, the résumé can be seen as an amalgamation of both the "ingredients" of professional genre knowledge (Artemeva, 2009, p. 172) and the disciplinary expertise that she has acquired up to the present version. However, faced with a variety of more or less generic résumé resources (Randazzo, 2016), the student may feel at a loss to persuasively convey this expertise in her résumé. WAC consultants leading résumé workshops and/or visiting classes to support students writing in this genre and writing instructors, especially those teaching a communications course that is not linked to a content one, may also be unsure of how to teach discipline-specific résumé advice. This chapter articulates one approach to do so, which is based on empirical research addressing the gap of rhetorical, disciplinary language in engineering résumés (Berdanier et al., 2016a, 2016b; Fillenwarth et al., 2018). This approach can be integrated with other assignments that ask students to conduct primary and secondary research about résumé best practices (Randazzo, 2016) while encouraging students to participate in their disciplinary communities of practice (Wenger, 1998).

1 Other recent, comprehensive literature reviews of résumé scholarship include research from disciplines such as career development and applied psychology (Randazzo, 2016) and in technical and professional communication and STEM education journals (Fillenwarth et al., 2018).

METHODOLOGY OF CODING RÉSUMÉS FOR DISCIPLINARY DISCOURSE

The pedagogical approach we present is based on the results of a mixed-methods study that sought to examine the characteristics of effective and ineffective engineering résumés, which we will briefly describe (for a more detailed discussion, see Fillenwarth et al., 2018). In this IRB-approved study, our team analyzed a corpus of résumés (undergraduate students, graduate students, and professionals) through both qualitative and quantitative means. The résumés in the corpus were collected from a national sample that ranged from first-year engineering students through retired professional engineers. After collection, 31 résumés were selected as part of the corpus (others were excluded based on non-conformity to résumé conventions, e.g., CVs). To validate our method and findings, we are currently working on analyzing a larger data set of more than 100 engineering web-résumés.

In the first stage of analysis, résumés were initially sorted qualitatively into *excellent*, *moderate*, and *poor* categories via an engineering rubric developed by the University of Iowa College of Engineering (2015), which was selected given its coverage of both discipline-specific and generalized aspects of résumé writing. For example, one of the excellent criteria on the rubric is "Use industry specific language and terminology," which would be unique to engineering.

After sorting, each résumé was then quantitatively analyzed according to the American Association of Engineering Societies' (AAES) Engineering Competency Model (see Figure 7.1). The Competency Model was published in 2015 through a collaboration between the AAES—an interdisciplinary engineering society comprised of engineers working in academic, government, and industry settings—and the U.S. Department of Labor. This Model is part of the larger Industry Competency Model Initiative from the U.S. Department of Labor's Employment and Training Administration, which collaborates with partners across multiple industries to develop and maintain dynamic models of the foundation and technical competencies that are necessary in economically vital industries and sectors of the American economy. The goal of the effort is to promote an understanding of the skill sets and competencies that are essential to "educate and train a globally competitive workforce" (CareerOneStop, 2018, para. 4).

To visualize these skill sets, each Industry Competency Model within the U.S. Department of Labor's Competency Model Clearinghouse (of which the AAES Engineering Competency Model is a part) is pyramid-shaped and composed of six tiers that showcase various competencies. These tiers are broadly divided into "Foundation Competencies" (Tiers 1-3) and "Industry Competencies" (Tiers 4-6). Each of the competencies within each tier are also called

"Building Blocks" (these are separated by a small vertical line in the original AAES Engineering Competency Model that we modified in Figure 7.1, giving the appearance of blocks).[2] Each Competency Model shares the same tiers (from bottom to top: Tier 1: Personal Effectiveness, Tier 2: Academic Competencies, Tier 3: Workplace Competencies, Tier 4: Industry-Wide Competencies, Tier 5: Industry/Sector Functional Areas, and Tier 6: Job-Specific Competencies). However, the Building Blocks, or specific competencies, that comprise each tier vary by industry. While Tiers 1 through 3 consist of broader competencies that may be applicable to a range of fields, there are differences between various Competency Models even at these levels. For example, both the Engineering and Cybersecurity Competency Models include "Interpersonal Skills" and "Integrity" as Building Blocks Tier 1. In Tier 2, however, the AAES Engineering Competency Model lists "Computer skills" while the Cybersecurity model lists "Fundamental IT User Skills." These competencies become more and more field specific in higher tiers.

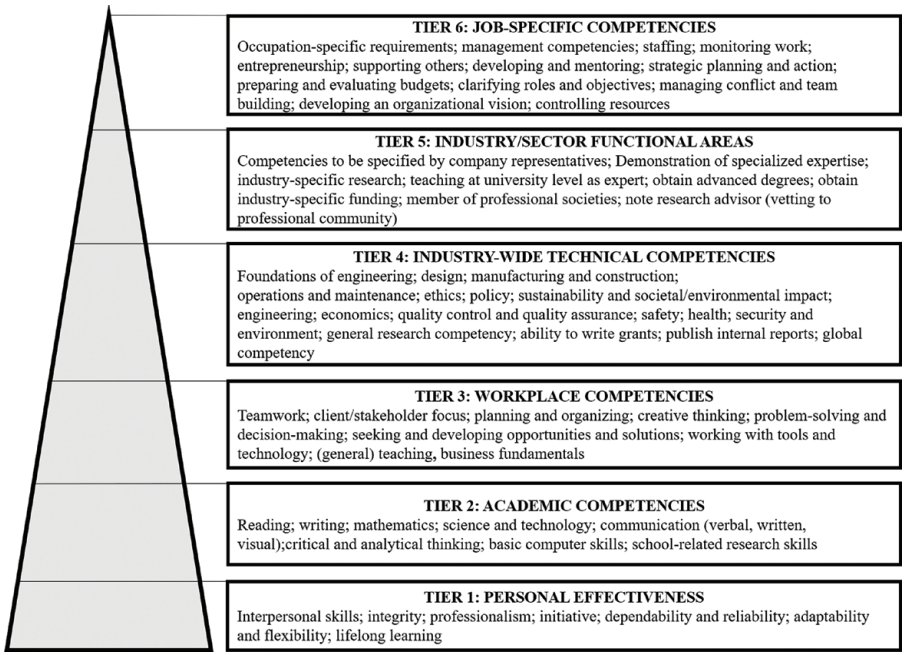

Figure 7.1. Modified AAES Competency Model, update with example competencies. Modified from AAES (2015), Berdanier et al. (2016a, 2016b), and Fillenwarth et al. (2018).

2 For this reason, we use competencies and Building Blocks interchangeably within this chapter.

The AAES Engineering Competency Model was chosen as a tool for analysis in this project because of its (1) clear articulation of engineering-specific competencies; (2) separation of these competencies into quantified tiers, with each higher tier representing more specialized competencies; and (3) development by industry representatives, rather than only academics. Using the AAES Engineering Competency Model for our résumé analysis, we coded résumé entries (individual units of meaning) by assigning the numerical score of the tier that the competency displayed in the entry. For example, in Figure 7.2, we coded "Graduate Student Instructor" as a Tier 5 because this entry demonstrates "teaching at university level as expert," which received a quantitative score of 5. A less specialized teaching experience, such as tutoring middle schoolers in algebra, would be coded as a Tier 3 and achieve a score of 3.

GENERAL ENGINEERING **GRADUATE STUDENT INSTRUCTOR (5)**

[Southeastern] University, [Location] Spring 2014

Freshman and transfer students learn engineering fundamentals such as basic equations, unit conversions, and analysis techniques using Microsoft Excel software.

Single section of a three credit hour lecture course with **approximately 50 students (6)**

Presented (2) 50 minute lectures three times per week

Graded tests and projects (3) throughout the semester

Figure 7.2. Sample coding. Coded entries in bold.

One of the strengths of using the Industry Competency Models is their flexibility. During our initial research, we were able to easily code the vast majority of résumé entries. However, we found that some experiences in the corpus of résumés did not explicitly align with a block or tier of the AAES Model (e.g., proficiency in a second language). Rather than viewing this as a shortcoming of the Model or viewing linguistic proficiency as an item not worthy of inclusion, we used the Model's classification system to help us determine where the competency might fit within the Model. We determined that proficiency in a second language could potentially be categorized in a number of ways, perhaps as a Tier 1 Personal Effectiveness competency ("Lifelong Learning") or Tier 4 Industry-Wide Technical Competency. Because there was no mention of global competencies in the AAES Engineering Competency Model, we decided to code second language proficiency as Tier 4 by considering "Global Competency" to be a Building Block for this tier, based on calls in engineering education literature

for globally competent engineers. While there are certainly viable arguments for why this competency could be placed elsewhere, we view the Model as an agile schema that gains its value in its ability to encompass a diversity of experiences.

As theorized in our prior work (Fillenwarth et al., 2018), members of disciplinary communities of practice display identification with that discipline not only through their activities, but also through their use of language. This use of language occurs at general levels, such as genre use, as well as at particular levels, such as lexicon. Building on our initial definition of "disciplinary discourse" from the introduction, we use this term to refer both to the lexical choices made by members of a discipline and to the use of such discourse, which is reflective of one's integration into that disciplinary community of practice. We posit that résumé entries can be analyzed quantitatively to produce a "score" reflective of one's use of disciplinary discourse, and that this score can be a useful tool in helping students revise their résumés and reflect on their professionalization.

After coding each entry in each résumé, we calculated the "Disciplinary Discourse Density" score, which is the sum of all the codes present in a résumé divided by the total number of codes (see Figure 7.3).

Overall Disciplinary Discourse Density =
Sum of Tier Codes / Total Number of Codes

Example: Disciplinary Discourse Density for Figure 2:
(5 + 6 + 2 + 3) / 4 = 4 (out of 6 maximum)

Figure 7.3. Calculation of Disciplinary Discourse Density.

After comparing Disciplinary Discourse Density scores across the qualitatively strong, moderate, and weak résumés, we observed statistically significantly higher levels of disciplinary discourse in "excellent" résumés than moderate résumés, and similarly statistically significantly higher scores in "moderate" résumés than "poor" résumés. Since higher tiers contain more specialized skills, the Disciplinary Discourse Density scores for résumés using more specific and relevant disciplinary language achieved higher scores when averaged.[3] However, professional-level engineers through undergraduate engineering students were all represented in the "excellent" category, which shows that crafting a persuasive résumé does not necessarily rest on the range and depth of one's engineering experiences or the adherence to generic résumé writing "rules" alone, but also on the writer's ability to describe their qualifications according to the values and needs of their disciplinary audience.

3 See Fillenwarth et al. (2018) for additional details and examples on coding.

This unique combination of qualitative and quantitative data suggests that disciplinary discourse may be a useful tool in the classroom to help students understand the actions, abilities, and characteristics that are sought in engineers (i.e., the "rules" and "expectations") and to display their identity as an engineer by using engineering discourse. The next sections of this chapter outline how we have adapted our research and the AAES Engineering Competency Model into classroom exercises that carry out these goals while teaching students both general and disciplinary résumé conventions.

QUANTIFICATION OF DISCIPLINARY DISCOURSE AS A PEDAGOGICAL TOOL IN THE WRITING CLASSROOM

Our classroom implementation seeks to take advantage of this clear delineation of engineering competencies in the AAES Engineering Competency Model and our findings on disciplinary discourse. We do so by encouraging engineering students to use the AAES Engineering Competency Model to consciously classify the various types of skills, experiences, and knowledge they acquire during their formal education and articulate their value. This tool can be particularly useful for helping students learn more about the field of engineering and its disciplinary expectations, ultimately guiding the development of their identity as engineers.

We have successfully used the AAES Engineering Competency Model to help students revise their résumés in two different courses: Sophomore Engineering Clinic at an East Coast research university (a hybrid first-year composition, technical writing, and design course for engineering students) and Writing in the Technical Professions at a Midwestern land-grant university (a TPC service course). For both courses, we spent two to three days covering the AAES Engineering Competency Model in our professionalization units, where we teach skills such as reading job ads and writing career documents (e.g., résumé and cover letter). While we largely review how we have adapted our résumé coding heuristic into pedagogical exercises for engineering students, we end this section with a discussion of how these exercises can be adapted for students in other disciplines.

INTRODUCTION TO DISCIPLINARY RÉSUMÉ CONVENTIONS

In our approach, we begin by talking with students about various ways to theorize résumés. One way of thinking about résumés, which the majority of students are familiar with, views résumé writing simply as an exercise in listing experiences

and putting them in a specified format (e.g., students' names in large type, sections with headings, short phrases and bullet points led by action verbs, etc.). In this view, the résumé essentially acts as a camera to capture students' experience in a presentable way. Next, we introduce the idea of disciplinary résumé conventions through the idea of discourse communities. After helping students grasp how different communities have different ways of acting, speaking, and writing that may be unique to that community, we explain that résumés, too, can be a sign of how connected a person is to a community. If an engineer communicates like an accountant, a teacher, or a historian, they are less likely to be perceived as having competency in engineering. One of the goals of a résumé, then, is to persuade readers of the candidate's competency as an engineer through a combination of content, style, and design—all of which can fall under the category of writing.

Exercise 1: Introduction to AAES Engineering Competency Model and Coding

After providing theoretical context, we introduce students to the AAES Engineering Competency Model as a tool they can use to analyze their résumés and gain insight into how well their résumés might meet disciplinary expectations. We present the AAES Engineering Competency Model to students, provide them time to read through the categories and discuss them, and then show students how to code résumés using the Model. We provide several sample résumé entries to students in class (see Figure 7.4), and they assign codes to each of the entries. Next, we show students how we coded the résumés (see Figure 7.5), and we lead a discussion analyzing similarities and differences in the codes students assigned and those the instructor assigned.

Directions: Code the following underlined entries from the experience section of a résumé.

EXPERIENCE

BOLT Research Lab

- Gained valuable work experience in **operating** a **CNC Machine Developed research plan; directed team of interns to complete project**
- **Analyzed the assembly** within **ANSYS**, **ran simulations** using realistic forces and pressure by looking at **part strength** , **bolted flange separation** , and **contact pressure** .
- **Kept work area clean** and **organized**

Figure 7.4. Sample in-class coding exercise.

Through this discussion, we seek to highlight how the AAES Engineering Competency Model should be used as a guide rather than a strict set of rules, and that minor differences in coding are typically not problematic (e.g., coding an experience at Tier 3 versus Tier 4). When there are large discrepancies between students' coding and their peers' or instructor's coding, we use the discussion as an opportunity to think critically about the value of certain qualifications for engineering communities and how and why they may be viewed a particular way, depending on both the qualification and the language that is used to describe it (e.g., "Designed bottle rocket" vs. "Used parametric design to collaboratively develop and test bottle rocket to meet customer specifications").

Directions: Code the following underlined entries from the experience section of a résumé.

EXPERIENCE

BOLT Research Lab

- Gained valuable work experience in **operating (3)** a **CNC Machine (3)**
- **Developed research plan (6)**; **directed team of interns to complete project (6)**
- **Analyzed the assembly (4)**within **ANSYS (3)**, **ran simulations (4)** using realistic forces and pressure by looking at **part strength (4)** , **bolted flange separation (4)** , and **contact pressure (4)** .
- **Kept work area clean (1)** and **organized (1)**

Figure 7.5. Sample in-class coding exercise with instructor codes.

Exercise 2: Calculating Disciplinary Discourse Density

The second exercise we ask students to complete is calculating the Disciplinary Discourse Density of the sample they coded. Students add their codes together and divide by the total number of codes they assigned, which results in a score between 1 and 6. We discuss that this score is not a definitive score reflecting the strength of the résumé, but simply a numeric way to analyze how disciplinary discourse is at work in a résumé. We also relate the findings of our research that stronger résumés tend to have higher Disciplinary Discourse Density scores, regardless of the education level of the résumé writer.

Exercise 3: Revising Sample Résumé Entries

For a third and final exercise, we provide students with additional sample résumé

entries that they are likely to score in Tiers 1-3. After asking students to code the entries, they rewrite the entries in order to raise the code to a higher tier, using the AAES Engineering Competency Model as a reference. For this exercise, the entries in the sample we provide are similar to projects students complete as part of their curriculum, ensuring students will be familiar enough with the experiences to understand what competencies each résumé entry might involve (see Figure 7.6). Figure 7.7 shows a possible revision of the action verbs and descriptions within Figure 7.6 that incorporates entries related to the "Foundations of Engineering" Building Block in Tier 4 such as "Designed" and "Conceptualized."

Directions: Rewrite the following résumé entries to incorporate a broader range of engineering competencies

Fundamentals of Electrical Design, Fall 2017

- Completed solar panel design project
- Participated in writing of technical report

Senior Design, Spring 2018

- Assisted with team guitar prototype

Figure 7.6. Sample in-class codes for students to rewrite.

Directions: Rewrite the following résumé entries to incorporate a broader range of engineering competencies

Fundamentals of Electrical Design, Fall 2017

- Designed a solar energy heating and electric system for Everson Ranch. Provided a link between the team and client by communicating effectively with both parties, as well as synthesized team members' contributions into a single report
- Researched solar technology, including materials, cost, and resilience and presented design proposals in technical reports

Senior Design, Spring 2018

- Conceptualized, designed, and built an autonomous player guitar with design team
- Led programming in both Python and Arduino
- Collaborated with team members in assembling the electrical system

Figure 7.7. Sample in-class codes for students to rewrite, with revisions.

Exercise 4: Résumé Revision and Professionalization Goals Reflection

After these exercises, we provide students time to code their own résumés using the AAES Engineering Competency Model and calculate their Disciplinary Discourse Density. We then ask students to work on revising their résumés toward the goal of maximizing the tier code of their experiences. During this time, we encourage students to collaboratively work through concerns that arise, and we provide ample opportunity for one-on-one discussion with the instructor.

At the conclusion of this unit, we ask students to reflect on their professionalization goals for their remaining time in college based on the areas for growth they identified in their revision process (see Appendix). Students identify specific activities that will enable them to showcase competencies which they would like to add or increase. This reflective activity involves students in Etienne Wenger's (1998) "modes of belonging" (engagement, imagination, and alignment) redefined as "modes of identification" (Wenger, 2010, p. 184). Engagement refers to the relationships, interactions, and practices that one undertakes in the negotiation of meaning within community work. Imagination considers the images that members can have of themselves, their world, and their past and future. Alignment describes the synchronization of members' energies, actions, and practices to their respective communities of practice. These modes do not exist in isolation, but work together to balance each other's potential drawbacks (Wenger, 1998, pp. 173-174). Specifically, this activity encourages students to *imagine* their professional roles and contributions with their respective industry and thereby *align* their present and future academic and professional experiences to the expectations of this field. This reflection prompt also harks back to the central goal of this approach to résumé analysis—to *engage* students not only in learning to write in the conventions of résumés associated with their disciplines, but also in using writing to learn about disciplines and their professional expectations. Ultimately, the written reflection that occurs at the end of this project enables students to imagine their positions in the professional world and to help construct their professional identities.

POTENTIAL CHALLENGES OF IMPLEMENTATION

One challenge that inevitably occurs during implementation is that students, with their diverse backgrounds and experiences, often have résumé content that is not contained within one of the existing Competency Model tiers. In re-

sponse, we explain to students that the Competency Models cannot reasonably contain every possible experience. We remind students that the key is to view the AAES Engineering Competency Model as a flexible, adaptable tool to filter one's experiences through the expectations and language of the discipline. The exact categorization of a single item matters less than the process of critically reflecting on how qualifications could be described in a way that aligns with a particular competency and how these will ultimately be perceived by professional audiences. As we work with students on revising their résumés, we encourage them to articulate the reasoning behind their classification of various achievements and competencies to keep this larger picture in mind.

Another challenge we have encountered during this unit is that students—especially at the freshmen and sophomore level—experience feelings of inadequacy as they calculate their Disciplinary Discourse Density scores. At this stage in their careers, the majority of students has had few leadership experiences that would earn scores in Tiers 4-6, resulting in Disciplinary Discourse Density scores they often perceive as lower than ideal. In response to these concerns, we facilitate a discussion regarding interpretation, writing, and experience. First, we remind students that the Disciplinary Discourse Density scores are only one way of interpreting the degree to which a résumé displays disciplinary identification, and that an audience would be aware of students' grade level when reading their résumé. We also explain that a range of competencies are essential for the profession of engineering, including Tier 1-3 competencies, and that these are still important to include. While students might perceive that their Disciplinary Discourse Density score should be as close to 6 as possible, a score in the 3-4 range could actually showcase a broader array of competencies.

Second, we discuss strategies for rewriting résumé entries to maximize the number of competencies that are showcased, talking with students about lexical choices and their impact on readers. We also incorporate a discussion of ethics, reminding students about the importance of using language responsibly so as not to misrepresent their abilities. Especially salient for freshman and sophomore students, though, is the opportunity to work with other departments and student development offices. This may be an opportunity to partner with offices that support co-ops or internships, undergraduate research opportunities, or service learning and study abroad experiences. At the very least, instructors can ask students to plan activities or desired experiences for the upcoming semester, using resources and websites available from their university. This can also be an effective "socialization" activity to get students at the freshmen and sophomore levels familiar with resources and opportunities available, and a method for engaging more senior students in the communities of practice that they will be joining soon.

RECOMMENDED ADAPTION OF CLASSROOM EXERCISES FOR STUDENTS ACROSS THE DISCIPLINES

While the AAES Competency Model caters specifically to engineering, we argue that it can still be adapted to other disciplines to support those students in computer science, agriculture, and other majors who enroll in TPC courses. Since many of these competencies are also valuable in workplaces across these fields, we encourage these students to think about how they can adapt "Foundations of Engineering" in Tier 4 to their own discipline. The AAES Competency Model is just one of the several examples the Competency Model Clearinghouse offers across a range of industries such as Fundamentals of Health Care, Bioscience, and Entrepreneurship. Whereas an engineering student might add coursework in thermodynamics and physics into his résumé to address the "Foundations of Engineering" Building Block in Tier 4, a computer science student might create a detailed list of programming languages she knows to speak to the "Fundamentals of Information Technology" Building Block equivalent in Tier 4 of the Information Technology Competency Model.

The Competency Model Clearinghouse also offers a Generic Building Blocks Competency Model that can be modified by students who do not see their specific discipline reflected in the current selection of Models. This Model includes competencies like "Teamwork," "Problem Solving," and "Communication" that a professional in any field should be proficient in that students can add to using resources like the Bureau of Labor Statistics (BLS). For instance, a student can search their preferred occupation (to use the BLS' terminology) in the BLS to learn more about what duties people in this position have, what skills they need to complete this work, and what educational degrees and certificates they need; then, students can turn this information into discipline-specific competencies to add to the Generic Building Blocks Competency Model or to an existing Model within their discipline (especially for Tiers 4 and 5, which are sometimes left blank).

When teaching the AAES Competency Model in introductory TPC courses that include non-engineering majors, we ask students to create their own tailored Competency Model using the BLS as an initial homework assignment. Engineering students also complete the assignment to find additional competencies not listed in the modified AAES Competency Model we give them (see Figure 7.1). Then, in class, students are encouraged to share the discipline-specific competencies they listed as a way to collaboratively build Models representing sub-disciplines in engineering as well as various, non-engineering disciplines. With the adaptation or creation of this Competency Model, students are then able to calculate their own Disciplinary Discourse Density scores with

their résumés. Further, this approach could be used for overarching writing competency assessment on a larger scale, turning it into an analytic method, calling to mind Mike Palmquist's chapter, "Learning Analytics in Writing Instruction: Implications for Writing Across the Curriculum," in this volume.

A classroom exercise like this one could be combined with an assignment like Chalice Randazzo's (2016), in which students interview disciplinary experts to learn about particular competencies for their field; such knowledge would be especially useful for freshman or sophomore-level students who might not have taken specialized courses in their major. In addition to referring to the BLS, students can mine the internet (e.g., job position announcements or social media) or arrange meetings with faculty or graduate students to gather "data" by which to populate tiers in the Generic Building Blocks Competency Model or their respective Industry Competency Model provided by the growing Competency Model Clearinghouse.[4] This work also has the potential to synthesize the student's disciplinary knowledge with the writing instructor's or WAC consultant's rhetorical expertise much in the same way that Randazzo's "reimagined" assignment asks students to conduct primary and secondary research about résumé best practices as they write up their job documents. In so doing, students are able to build professional networks, become better evaluators of conflicting résumé suggestions, and recognize the rhetorical expertise of their writing instructors in the process (Randazzo, 2016, p. 289).

Outside of direct classroom implementation, there is potential for the Competency Models and quantification of disciplinary discourse to be used as a tool in WAC workshops to help augment professionalization assignments across the curriculum and/or for faculty professional development. For example, a WAC Coordinator could teach and lead disciplinary faculty through the coding process to train them in how to help students use disciplinary discourse not only in résumé writing but in a range of writing assignments.

BENEFITS OF ADOPTING COMPETENCY MODELS AND QUANTIFICATION OF DISCIPLINARY DISCOURSE ACROSS THE CURRICULUM

Our disciplinary discourse-based approach to résumé pedagogy is not designed to replace lessons on rhetorical situation, genre, layout, content, and design that

4 The Competency Model Clearinghouse currently maintains Competency Models for the following industries: Accommodation and Food Service; Construction; Energy and Utilities; Entrepreneurship; Finance and Insurance; Health Care and Social Assistance; Information; Manufacturing; Professional, Scientific, and Technical Services; Retail Trade; and Transportation and Warehousing (see CareerOneStop, 2018, to view models online).

are traditionally incorporated into résumé instruction. Rather, we see it as a supplemental approach that offers a number of benefits to students in a range of cross-curricular writing contexts.

Acknowledges Students' Competencies, Not Just Experiences

One benefit of the Competency Models provided by the Competency Model Clearinghouse combined with our approach to quantifying disciplinary discourse density is that they encourage students to think through potential résumé entries in terms of competencies, not just experiences. Students often have experiences and achievements that they have forgotten to include or that they have discounted as insignificant. By emphasizing competencies relevant to a particular industry, the Competency Models enable instructors and WAC consultants to help students think deeply about the competencies embedded in particular experiences. For example, a student with experience in retail work may not initially believe this experience is relevant to obtaining a job in Financial Services. By considering the Tier 1 Building Block of Integrity and Ethics in the Financial Services Competency Model, however, they may realize that they can include information on their résumé related to the responsible handling of large sums of money or performing store closing procedures. Similarly, a student can use the competencies as a heuristic for thinking through what they have accomplished. For instance, a student can see the competency "Teamwork" (present in a number of Industry Competency Models) and use this competency as a lens through which to view and characterize their backgrounds.

We also use this moment as an opportunity to emphasize the importance of additional professional development. As students work with these Competency Models, they identify gaps in their experience and expertise, and we work with them to develop concrete plans for building their competencies in the remainder of their career. As a result of these discussions, many students have approached us for assistance in applying for internships and research experiences, demonstrating that this focus on competencies motivates students to gain additional experiences that will provide them with the opportunity to develop new competencies.

Encourages Reflective Thinking on Professional Identity

The Competency Models provided by the Competency Model Clearinghouse provide opportunities for deep reflection by asking students to categorize each of their achievements according to industry and government standards. As students participate in exercises where they analyze their own disciplinary discourse in their résumés, they have the opportunity to think critically about how their

experiences might be assessed from the perspective of various professional gatekeepers. Rather than simply listing every experience in which they've participated, students are encouraged to choose experiences that showcase an array of competencies and to write about these experiences in ways that emphasize their foundation and industry expertise. At its heart, this approach is a deeply rhetorical exercise, asking students to move beyond simply listing their previous experiences toward writing their résumés for a very particular disciplinary audience (e.g., not just a hiring manager, but the larger disciplinary community to which this manager belongs). This exercise also facilitates reflective practice, a competency which has been linked with development of expertise across contexts, including engineering (Adams et al., 2003; Atman et al., 2010).

Introduces a Novel Approach

With its integration of coding and calculations, this approach introduces a novel quantitative aspect to résumé pedagogy. Our engineering students seemed to enjoy the quantitative approach to writing since students in STEM fields feel comfortable working with numbers. In student comments, many reported that they liked the novelty of approaching writing from a quantitative perspective and it was helpful in giving them a different view on their writing. Though it's possible that not all students across the disciplines would appreciate this quantified approach, the actual process of coding and calculating disciplinary discourse is accessible enough for any college-level student.

Supports Faculty Across the Curriculum in Providing Disciplinary Résumé Development

A final benefit of this approach is that it engages students in discipline-specific résumé development, regardless of the instructor or WAC consultant's expertise. Given the diverse makeup of U.S. higher education institutions and curricula, there is an array of configurations in which résumé writing is taught. Many courses that teach résumé writing enroll students from a range of disciplines and may be taught by instructors who do not share expertise in the students' respective areas. Similarly, faculty from different disciplinary backgrounds can use this method to assist students to hone their writing choice in their résumés.

CONCLUDING THOUGHTS

Overall, we see the quantitative disciplinary discourse approach to résumé writing as a tool that can supplement more traditional approaches, and can be ex-

tended from our experiences in engineering to other disciplines as well. While our approach here is centered particularly on engineering due to our own backgrounds and teaching experiences, we believe this approach could be successfully implemented in a range of disciplines to help students develop not only more rhetorically savvy résumés, but a greater understanding of their disciplines and their developing identities within them. The recommendations provided harness our experiences with our research-driven, cross-disciplinary model, and extend its usefulness to other instructors across the university curriculum in support of disciplinary professionalization.

ACKNOWLEDGMENTS

We thank our reviewers, Kristin Marie Bivens and Brian Hendrickson, and the editors for their comments that greatly improved this manuscript.

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APPENDIX: SAMPLE REFLECTION PROMPT

In this unit, you've learned about the AAES Engineering Competency Model, coded your résumé, calculated your Disciplinary Discourse Density scores, and revised your résumé. Now, it's time to think about how you can use what you've learned to strategically plan your professionalization activities over the next few years. Answer the following questions:

1. Which Tiers and/or Competencies do you have the most of?
2. Which Tiers and/or Competencies would you like to add before graduation?
3. What specific experiences will you seek out in this next few years? List at least three activities and the competencies you will gain from each (provide the numerical tier code as well). List at least one per academic year.
   a. Sophomore Year:
   b. Junior Year:
   c. Senior Year: