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Programmatic Outcomes in Undergraduate Technical and Professional Communication Programs

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ABSTRACT

This article discusses the process of coding and analyzing data from 376 Programmatic Student Learning Outcomes (PSLOs) from 47 technical and professional communication (TPC) undergraduate degree programs. The resultant findings suggest that TPC program administrators adopt common PSLOs, eliminate embedded PSLOs, and consider the assets of PSLOs beyond assessment. Such practices will ensure that PSLOs support students as a primary audience and cohere with broader disciplinary understandings of education at the undergraduate level in TPC.

Program student learning outcomes (PSLOs) focus on practical and conceptual skills and indicate what students are expected to learn through curricular and co-curricular activities associated with programs. To date, TPC has only a handful of studies that directly examine PSLOs, including a call for an outcome statement (Ilyasova & Bridgeford, 2014) and articles that suggest the use of program outcomes in assessment (Barker, 2012; Carter, Anson, & Miller, 2003; Say, 2015). Anderson, Anson, Townsend, and Yancey (2012) note "expanded or even continued funding depends on demonstrating [a program's] ability to achieve specific learning outcomes" (p. 88); beyond concerns of sustainability of programs, TPC can engage in discussions about PSLOs as a way to guide programmatic and curricular development in support of student learning.

In order to examine PSLOs as a method of guiding programmatic and curricular development, we followed an inductive methodological approach that extrapolates principles from existing practice. As Huot (2002) encouraged, this type of inductive reasoning allows observation of programs' existing practices to generate field-wide principles. We asked: If we collected and examined current PSLOs, could we determine commonalities across the field?

After a discussion of the exigencies for examining PSLOs in TPC programs, we describe our method and practice of gathering, coding, and analyzing 376 programmatic outcomes and then offer results that encourage TPC program administrators and faculty to create programmatic outcomes focused on rhetoric, writing, technology, design, ethics, research, collaboration, and professionalism. We then share programmatic implications that include using common PSLOs, eliminating embedded outcomes, and considering PSLOs beyond assessment. The intent of this research is not to create a prescriptive "outcomes statement" but to provide a data-driven analysis based on field-wide information. We hope these findings are useful for TPC program administrators as part of their informed efforts to build, grow, and sustain TPC programs.

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Recommended considerations for programs revising or establishing programmatic student learning outcomes

In 2012, Pope-Ruark argued that technical and professional communication (TPC) scholars should adopt tools from the well-established Scholarship of Teaching and Learning (SoTL) as a way to further establish the validity of research and build a stronger disciplinary identity. Though the field researches pedagogical and programmatic practices, Melonçon, Rosselot-Merritt, and St.Amant's (2020) meta-synthesis indicated 21% of the field's recent research focuses on pedagogical and programmatic practices, yet none of the pieces in their dataset engaged SoTL.

Allen (2004) noted that outcomes are crucial for TPC programs because they demand "evidence of our students' learning and abilities" (p. 95). Moreover, Allen suggested that failure to consider outcomes "may not only threaten institutional accreditation but, just as importantly, may signal that technical communication lacks legitimacy as a true program with meaningful outcomes." In the intervening 16 years since Allen's article, TPC program administrators have been increasingly required to exhibit sufficient return on investment for all stakeholders at a variety of programmatic levels. Thus, TPC has a growing body of work on assessment (e.g., Allen, 2004; Boettger, 2010; Carnegie, 2007; Coppola, Elliot, Newsham, & Klobucar, 2016; Hundleby & Allen, 2010; St.Amant & Nahrwold, 2007; Taylor, 2006; Warnock, Rouse, Finnin, Linnehan, & Dryer, 2016), which attends to outcomes as well. Certainly, assessment-based outcomes can help administrators develop evidence-based justifications for the validity of and need for curricula to support student learning. In this turn toward evidence, Barker (2012) looked at programmatic outcomes for both undergraduate and graduate programs while Henschel and Melonçon (2014) created a model to match "core courses" with program outcomes and conceptual and practical skills for students.

Consistently, work that speaks to outcomes does so from the limited perspective of institutional assessment. Examined via assessment, PSLOs are usually reduced to the lowest common denominator to fulfill a pre-determined assessment matrix or institutional rubric. This use of PSLOs does little to actually engage TPC program administrators and faculty in meaningful reflection on the role PSLOs can play in program development and sustainability. Anderson (2010) sums up some of our frustrations, "[t]he literature on assessment provides an abundance of advice for … analyzing student artifacts and refining curricula based on what is learned. Far less advice addresses the fundamental task of defining a program's educational objectives" (p. 62) and helping faculty "identify objectives that are most worthy of pursuing" (p. 58). Anderson offers that a primary task of PSLOs is to focus a program's educational objectives. In the work we share below, we aim to extend Anderson's argument and offer strategies for TPC program administrators to develop PSLOs that are student-focused, as PSLOs serve as touchstones and guides for students' reflective practice throughout their time in a TPC program.

Recognizing the substantial work on outcomes in composition, Maid (2005) argued that TPC programs could adopt the Council of Writing Programs Outcomes Statement for First-Year Composition (2014). In a later article, Maid and D'Angelo (2012) admitted that after working with the WPA Outcomes Statement for a period of time, they realized those outcomes were not sufficient for TPC's needs. They suggested "some kind of connection was missing" (Maid & D'Angelo, 2012, p. 259), and recognized TPC as a unique field with different needs. The differences between TPC and FYC prompted Ilyasova and Bridgeford (2014) to begin the process of creating a TPC version of an outcome statement. Using *techne* as a framework, Ilyasova and Bridgeford established five outcome categories: (1) Research; (2) Practices and Processes; (3) Knowledge of Conventions and Genre; (4) Collaborative Learning; and (5) Technology. This article complements Ilyasova and Bridgeford's conceptual work and buttresses it with field-wide data. To complement existing scholarship and more directly address the role SoTL increasingly plays in our program administration, and because PSLOs have concrete impacts on students and programs, we offer data in this piece that suggests strategies for developing student-oriented outcomes that align with existing practices in the field.

How we gathered and analyzed the data

We confined our analysis to undergraduate degree programs in TPC, which does not include undergraduate degrees with an emphasis, track or specialization (for more details on the distinctions between undergraduate degree programs, refer to Melonçon, 2014; Henschel & Meloncon, 2014, p. 47). Of the 76 undergraduate degree programs listed in TechComm Programmatic Central (Melonçon, 2020), we analyzed PSLOs of 47 institutions (62%), which resulted in 376 total outcomes. (The data is available for download here: https://cptsc.org/committees/assessment/.) We gathered outcomes from program websites, course catalogs, or by having Melonçon contact the TPC program administrator. The data were gathered in 2017 and 2018.

This project was reviewed by the institutional review boards of the University of Cincinnati #11-01-20-06 and the University of South Florida PRO 00038267. Adhering to the stipulations of those IRBs, we share information in aggregate and/or institutions are not identified by name but by their Carnegie Classification. (Refer to https://carnegieclassifications.iu.edu/classification_descriptions/basic.php for more details.)

Description of coding process

We approached the analysis of the outcomes by thinking in terms of "coding." Here we use "code" to mean "a word or short phrase that symbolically assigns a summative . . . attribute for a portion of language-based or visual data" (Saldaña, 2009, p. 3), and we understand the process of coding as systematic (Geisler, 2018). In this section, we describe how we created the code list and how we coded the PSLOs.

After a team discussion, the four researchers built an initial list of descriptive codes based on three primary criteria (1) an inductive reading of the program outcomes, (2) considerations of existing literature, and (3) our own situatedness within the field and our home programs. We used this initial list (which included 21 codes) during our first round of "collaborative coding." Smagorinsky's (2008) collaborative coding describes a process wherein "we reach agreement on each code through collaborative discussion rather than independent corroboration" (p. 401). Using this method of coding eliminates the need to try to attain the "standard" of inter-rater reliability (often recognized as 15% of the data coded at 80% agreement between the original coder and an additional coder), while still maintaining a high level of rigor. More so, collaborative coding "[provided] a means through which levels of expertise may emerge through the process of discussion in relation to data" (Smagorinsky, 2008, p. 402). Acknowledging the different levels of expertise was important in this project since the authors had varying degrees of experience in both data-driven research and programmatic work.

When we discussed the initial code list we used during the first rounds of coding, we kept the following two questions in mind: "why is the code important?", and "what is the use of this code in understanding programs?" The code list was finalized after four rounds of coding. The final list of codes, which includes 17 codes, is found in Appendix A. The coding of the outcomes was a multistage, systematic process that involved initial and second round coding followed by consistency coding and merge coding.

Initial coding

Three authors divided the outcomes into thirds and each coded two-thirds of the data set, which was ~230 outcomes each, while the fourth author coded all the outcomes. During our individual coding, we discovered discrepancies amongst some codes and found that others had not been clearly defined. These outcomes were coded and flagged for consideration during the next round of coding. In a few instances, coders created a new code during the initial coding process, proposing to the team that they be considered as relevant to the broader coding scheme (Authors 1, 2, and 3 shared an IRR of 86%). As we show in the next section, the process of talking through different interpretations of the outcomes generated a set of data in which the four researchers found consensus; thus, Smagorinsky's (2008) emphasis on bringing together disparate expertise and creating a space for that expertise to be recognized in a collegial and collaborative environment made for a reliable data set.

Second round coding

The second round of coding involved all four researchers looking at the initial round of coding, paying close attention to the codes where there was a disagreement from at least one of the three coders (n = 154), and then coding those outcomes a second time. During this second round of coding, we made a decision that not only affected how we proceeded through the last rounds of coding but also impacts our analysis and findings from the data.

At this stage, when discussing the codes where disagreement between coders existed, we considered an institution's outcomes holistically. That is, if an institution had five outcomes and one of the outcomes was already coded as *Writing* and the disagreement on another outcome was between *Writing* and *Genre*, then we coded the outcome as *Genre* if *Genre* was not already represented in an outcome from that institution. We assumed a school wouldn't want every outcome to be coded the same, so we discussed whether that outcome was appropriately coded or if another appropriate code fits the parameters, given the context of the school's other outcomes. We concluded that by looking holistically at a program's outcomes we were better representing what the program was trying to indicate vis-à-vis their outcomes and what they expect from their students. In other words, after reading and analyzing over 300 outcomes, a broad portrait of the programmatic identity that was being represented through PSLOs became apparent; we used this knowledge to further refine our coding decisions. For example, an outcome from a Master's Medium (MM/M2) institution, "understand and apply principles of rhetoric and document design in written, oral, and visual communications," was ultimately coded as *Design* rather than *Rhetoric* since this institution already had a *Rhetoric* code. The same was true for another of this university's outcomes that was also coded as *Rhetoric* during the first round, and which we changed to *Critical Thinking* in the second round to better fit the spirit of the program's outcomes.

Approaching outcomes holistically from a program level also helped us code what we refer to as *embedded outcomes*, which are defined as single outcome statements that include more than one outcome. It was unclear whether this was because of institutional mandates (e.g., no more than six program outcomes can be used for assessment) or for other reasons related to program design. For example, this is a series of embedded outcomes from a Very High Research University (R1): "Analyze ethical issues in writing, science, and technology; examine and apply writing in professional and disciplinary contexts; and identify cultural and social impacts of writing." This is actually three outcomes embedded together: one on ethics, one on writing, and one on cultural issues. Putting outcomes into a programmatic perspective enabled us to consistently address embedded outcomes in the coding process. By the end of the second round of coding, we had reconciled our discrepancies through collaborative coding.

Consistency coding

As the name implies, consistency coding is the internal process of ensuring that we applied the same code for like items. We sorted the outcomes by codes to check for any inconsistencies in how we interpreted an outcome. This was done by one person on the research team and corroborated by the others through discussion. In this context, we were heartened that the majority of codes had been consistently applied. However, 39 outcomes (10%) were flagged for consistency issues. In a conference call, the four authors collaboratively discussed and changed 27 codes (leaving 12 unchanged). This round of coding, too, underscores Smagorinsky's (2008) emphasis on collaboration and aligns with Saldaña's (2009) suggestion that coding is a cyclical and iterative process.

Merge coding and secondary codes

Once we completed the consistency coding, two authors examined the codes to determine if any codes needed to be merged together. In this final step, we eliminated four of our coding categories. Any time there are only a few data points assigned a code, it raises the question on whether that code is actually necessary. Coding research tells scholars that there is a balance between trying to capture all the variations and having a set of codes that can provide useful information (e.g., Auerbach & Silverstein,

2003; Creswell, 2013; Saldaña, 2009). By returning to our original question – "why is this code important and what is the use of it?" – we determined that other categories would capture the importance of the outcome. Thus, the original codes *Global, Style, Oral*, and *Critique* were eliminated and those outcomes re-assigned.

In the latter stages of coding, researchers sometimes will create secondary code sets to gather additional data that may provide insights into the overall research question. For example, we thought that it may be useful to assign secondary codes to the outcomes coded as *Rhetoric* to identify specific aspects of rhetoric an institution found important. However, the two authors who were initially tasked with secondary coding concluded that there was not enough distinct data to apply a secondary set of codes. Additional research into this code set may reveal more nuance of outcomes, but for this project's overall goal, doing secondary coding did not generate results we thought were noteworthy.

The goal of systematic coding is to use a process that helps categorize data in a way that can be described and analyzed. Invoking collaborative coding along with a multi-stage systematic process ensures that the process can be replicated and that the findings have a level of trustworthiness that is key to qualitative inquiry.

Limitations

While we received PSLOs from 62% of undergraduate programs, we recognize that the possibility that the findings would change if we had obtained more PSLOs. In addition, we were unable to consistently determine the date the creation for the outcomes we received. Thus, we expect at least a portion of the dataset are composed of programmatic outcomes that are perhaps outdated or in the process of being updated. A similar limitation is our lack of contextual knowledge surrounding the development of each institutions' PSLOs. For example, we do not know how these outcomes were shaped in response to local (e.g., institutional) or regional (e.g., accrediting agencies) demands. Specifically, we were unable to ascertain whether the number, type, and direction of outcomes were based solely on the needs of the program or were influenced by outside sources.

Findings

In this section, we present our findings from the coding of field-wide PSLOs. Figure 1 illustrates the breakdown of institutions aligned with the number of outcomes for the programs.
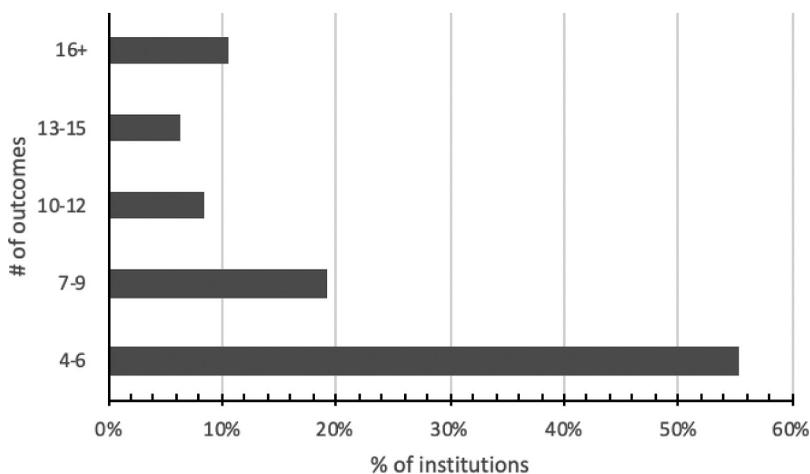

Figure 1. Relationship of number of outcomes to percent of institutions that have that number of outcomes.

Figure 1 shows the relationship between number of outcomes and the percentage of institutions that fall within that range of outcomes and illustrates the relationship between institutions and the number of PSLOs. The most common range for number of outcomes was 4–6 with 55% (n = 26) of schools falling in this range, while 26% (n = 12) of schools have 10 or more outcomes. The most outcomes were 21 (n = 1) and the fewest were four (n = 7). Grouping institutions by the number of outcomes provides TPC program administrators an ability to get an at-a-glance view of the field and where their program currently fits. Also, this data can help TPC program administrators determine how well they align with scholarship in teaching and learning literature, which suggests best practices of 4–7 PSLOs (Kenzie & McCall, 2018, pp. 68–69; Kuh, Jankowski, Ikenberry, & Kinzie, 2014, p. 33)

Additionally, TPC program administrators likely want to know what the most common outcomes we coded are. Table 1 provides the numerical summary of all of the codes and the number of outcomes assigned to those codes.

Keep in mind that some schools with a large number of outcomes could have two outcomes coded identically. For example, a Master's large (M1/ML) institution with 16 outcomes has four outcomes focused on rhetorical proficiency. Including all the codes and their counts offers an important perspective for placing the outcomes into a quantitative field-wide perspective. It also gives insights into the overall topics and concepts that the field finds important for student learning.

Most common unique outcomes

As part of our examination of the data, and to observe what patterns emerged, we adjusted the codes to count only unique outcomes per school. "Unique" here means that we only counted *Rhetoric* once as a unique data point for the ML/M1 institution with four *Rhetoric* outcomes mentioned above. Looking at the data this way meant there were 305 unique codes. The top four outcomes remain the same when comparing the total number of codes to unique counts of codes. These top four outcomes are included in at least half of the institutions in our sample. The order changes, but the consistency amongst these data underscores the importance of these concepts to TPC. These four outcomes, coded as *Writing, Rhetoric, Technology*, and *Design*, suggest common beliefs and values for the field. We wondered how many institutions in our data set currently had all four of these outcomes. Only 19% (n = 9) of the institutions in the study include all of the top four common outcomes, while 26% include three of the common outcomes, and the plurality (30% [n = 14]) include two. Looking at the data from this view

Table 1. All codes (n = 17) and counts of outcomes (n = 376) in the data set.

Code	Final Count
Rhetoric	44
Writing	41
Technology	33
Design	30
Other	25
Research	24
Ethics	20
Theory	20
Editing	18
Critical thinking	18
Practice	17
Collaboration	16
Professionalization	15
Genre	15
Communication	15
Project Management	14
Culture	11
GRAND TOTAL	376

suggests that while the common outcomes seem to hold value for the field, they are not all integrated into the PSLOs for the majority of programs.

Expansion of common outcomes

In this section, we focus on expanding some of the outcomes data to provide additional insights into the outcome categories. We expand on three of the top four codes since the most consistent outcome in the data set was *Rhetoric*. Among the different iterations of outcomes we coded as *Rhetoric*, it was clear that institutions were focusing on the primary rhetorical concepts of addressing the final deliverable to a specific audience for a defined purpose. Maid (2005) wondered whether rhetoric is an über outcome; in this analysis, it is clearly an outcome that has the most agreement in application across the field.

Writing

Examples of the diversity and flexibility of *Writing* in application are demonstrated in representative examples from a range of institutions:

- Produce, assess, and attune your own writing for different audiences and genres (M1/ML)
- Organize and produce written documents and oral presentations in a variety of professional formats using language that is lucid, concise, precise, grammatically correct, and appropriate to the topic, audience, and occasion. (Baccalaureate Colleges A&S and Diverse Fields, BAC)
- Compose documents in creative, expository, and professional genres in print and electronic forms that attend to artistic, socio-historic, and creative environments (High Research Activity, R2)

The universal nature of the *Writing* outcome exhibits Maid's (2005) reminder that outcomes should be "developed based on the premise of how writers really work and what writers really need to know" (p. 140). Other *Writing* outcomes focus on the interpretation of writing, such as "write clearly and effectively" (Master's Small, M3/MS). Some examples offer a more complete interpretation of the kind of writing that TPC programs are preparing students to do in the workplace, such as "write effectively in multiple forms, including print, mixed media, and multiple genres of nonfiction prose, developing proficiency in the genres and practices of the discipline" (R1). This outcome affords more precision in describing the shape and types of writing expected within TPC both inside and outside of higher education.

Technology

We used *Technology* as a code to capture the field's programmatic emphasis on technology, which we view as both a tool and a cultural force. The examples below indicate how different university types use *Technology* within PSLOs.

- Demonstrate a critical perspective of technology, its uses, users, and contexts (M2/MM)
- Students will use a variety of communication tools (M3/ML)
- Students will have the ability to use, analyze, and learn communication technologies. (BAC)

These outcomes illustrate the two primary ways that technology outcome was interpreted. First, it is a skill and tool that students need to understand and use, and second, students critique and analyze technology, e.g., "students will understand technology as a powerful and disruptive cultural force" (R1). These interpretations align with Brumberger's (2003) argument:

> The field of technical communication is in many ways inscribed by technology. As a result, technical communication programs not only must provide students with a foundation in the theory and practice of the field, but also must give students some level of proficiency in the technology tools they will need to put that knowledge into service in the workplace (p. 64).

The cultural and critique aspect of the technology outcome has also long been evident in the field as TPC has grappled with the fact that technology is never neutral (e.g., Durack, 1997; Haas, 2012; Hallenbeck, 2012; Melonçon, 2013). The need to maintain a dual emphasis on technology is vital in preparing students to not only use the technology but to be able to make thoughtful, critical decisions about it. Without the dual emphasis – use and critique – TPC programs leave students vulnerable to either not being prepared to enter the workforce or not being prepared to make ethical choices in the workplace through critique and analysis.

Design

Unlike the *Technology* code's more limited interpretations, the design code captured a wide range of diverse interpretations relating to the integration of design and/or visuals into programmatic outcomes. Acknowledging that there is a difference amongst document design, visual literacies, and creation of visualizations, the goal of the *Design* code was to capture the field's emphasis on design- and visual-related skills. The following four outcomes are representative of the range of interpretation of the design coded outcomes:

- Demonstrate competency with design principles through both the production and analysis of media objects. (R1)
- Apply visual communication strategies (ML/M1)
- Apply the principles of information design to written and visual information to create useable documents that address audiences' information and organizational needs and engage users in appropriate action (ML/M1)
- Demonstrate relevant visual literacies (R2)

Such multivalent interpretations for Design allow programs to emphasize a variety of abilities, whether students are creating, strategizing, or breaking down artifacts, as well as emphasize design abilities in a variety of mediums. An outcome such as "incorporate[s] images, video, sound, and/or graphics to enhance/amplify the message of writing," (ML) exhibits the flexibility of *Design* as a code for a wide variety of outcomes.

"Other" notes from the data: surprises and the case for local variation

In doing data-driven work, sometimes one can be struck by what is missing or did not appear. When we refer to surprises, we mean those things that surprised us mostly because of their absence in large numbers or absence completely.

- Only one outcome referenced Subject Matter Experts (SMEs), although several referenced specialized knowledge. Since technical and professional communicators often have to work with SMEs, we found it surprising that this was not highlighted more, but it could be that the ideas of interacting with SMEs are embedded in other outcomes such as collaboration.
- Only one outcome referenced engineering, math, physical sciences, humanities, and the social sciences. When we discussed this at first, we were surprised because of the field's historical emphasis on interdisciplinary, but then we realized that this may be a good surprise since it means that TPC programs are highlighting knowledge, skills, and abilities of TPC.
- Only one outcome referenced understanding an organization's business goals as it relates to the conceptual and practical skills identified in programmatic outcomes which counters ongoing work in the field that has identified this skill as one important for recent graduates to have (refer to Henschel & Melonçon, 2014).
- Only 3% (n = 11) of outcomes focused explicitly on one of the following: usability, user experience, or user centered design. The lack of outcomes specific to these areas seems to run

contrary to the long-standing emphasis between the TPC and these areas (for example, Lauer & Brumberger, 2016; Redish, 2010).
- Only 5% (n = 16) of the total outcomes were focused on the production or practice of deliverables. Though TPC is not a hyperpragmatist field (Schreiber & Melonçon, 2019; Scott, Longo, & Wills, 2006), production and practice are historically distinguishing features of TPC programs.

We do understand that outcomes should remain fluid and flexible, and PSLOs should be developed as assets for individual programs based on program identity, institutional requirements, and the expertise of faculty responsible for teaching the classes. Therefore, it was interesting that 18 outcomes were coded as *Other* and, as we discuss below, this was largely a representation of local curricula. For example, one outcome from an R2 institution asks that students "recognize the need to engage in life-longing learning." Additionally, some of the *Other* codes were overly specific, e.g., "understand scientific principles relevant to a field" (R2) or overly vague, e.g., "knowledge of key texts." (Doctoral/Professional, D/PU).

The *Other* code, while not insubstantial to the overall data set, represents both the expanding diversity of the field, and the flexibility such growth demands. Its representation in the data is concordant, too, with what we hope to accomplish with this project. That is, we want to provide TPC with appropriate data to connect their programs to field-wide concerns, while still maintaining flexibility for local concerns and priorities.

Recommended considerations for programs revising or establishing programmatic student learning outcomes

One of the main goals of this research was to offer the field a set of PSLOs that were common across the field as a way to help guide technical and professional communication program administrators in programmatic revision or development. Based on our data, we would propose the following outcomes be considered when building, expanding, updating, and sustaining TPC programs of any type. In these contexts, PSLOs need to be specific, measurable, and student-centered so that students understand what they should be learning. Based on the data, the following coded outcomes form the foundational orientation of a TPC program, as already well represented in the field: *rhetoric, writing, design*, and *technology*.

We would also recommend TPC program administrators consider *ethics, research, collaboration*, and professionalization as additional outcomes. These four outcomes are not specifically tied to the content knowledge of the field. Rather, these outcomes are necessary building blocks for students' future success.

Ethics has been a long-standing feature of TPC scholarship and practice (for instance, Dombrowski, 2000; Johnson, 1998; Ross, Oppegaard, & Willerton, 2019; Willerton, 2015), and that explicit emphasis was noted in the outcomes we coded as "ethics." Here are two representative examples of an ethics outcome:

- use ethical standards in citation, visual design, and language (M1/ML)
- understand the ethical and legal implications of online communication protocols within the context of the professional and technical writing fields (R2)

Ethics is an implicit orientation to the work and teaching TPC scholars and practitioners do. Colton (qtd. in Dragga, 2019) states "The practice of technical communication is always informed by ethical . . . frameworks even if we don't articulate those frameworks to ourselves or others on a regular basis." Outside of the outcomes, we coded as "ethics," there are also outcomes that were coded in other categories that demonstrate the ingrained nature of ethics to which Colton referred, such as this outcome from an MS/M3 school, "student will learn to find and use credible, relevant information

ethically," which was coded as "research" but includes a connection to ethics. Explicit inclusion of *ethics* would make clear to students the role ethics should play in their future work.

Research allows students to locate and/or produce information, assess its relevance, and apply the information to address a problem or issue. An example of *Research* from a (M1/ML) is "Identify and apply appropriate methods for investigating particular research questions."

Collaboration is the ability for students to work with others in pursuit of a common goal. In the data set, *Collaboration* focused specifically on working with others but often included a reference to diversity of participants in the collaboration process. Examples of *Collaboration* include:

- Address communication conflicts in small groups arising from participant diversity. (BAC)
- Ability to work collaboratively and understand the way TC projects are products of negotiated interaction. (M3/MS)

Professionalization is the outcome that speaks to preparing students to be professionals such as "Model professional responsibilities and ethical conduct (M2/MM)" or "Students will be prepared for a wide range of writing-related careers or graduate programs. (BAC)." Broadly at the undergraduate level, preparing students for work outside of the institution is of increasing importance, especially for disciplines situated in the humanities. Together, these outcomes comprehensively address both the most common outcomes from the data and point to space where the field is evolving.

Programmatic implications

PSLOs are an important aspect of programmatic work since they serve as curricular development and planning tools that facilitate assessment and ensure courses and activities align with the overall programmatic vision. In this section, we focus on the programmatic implications of the findings from coding field-wide TPC undergraduate program outcomes. We focus on three areas we hope will be generative for the field:

- The possibilities of using common PSLOs
- Considerations as to whether programs should eliminate embedded PSLOs
- Recognizing the utility of PSLOs beyond assessment.

The possibilities of employing common-to-the-field programmatic student learning outcomes

PSLOs make explicit to faculty what their program values and what each course needs to emphasize to ensure that students can recognize how different courses work toward common outcomes. It would be remiss of us not to mention the utility of PSLOs in supporting contingent faculty who work to ensure students are receiving necessary material and instruction. Such curricular expectations function as programmatic *techne* (Ilyasova & Bridgeford, 2014; Scott & Melonçon, 2017). The PSLOs identified and analyzed from across the discipline's undergraduate programs offer a grounding opportunity and point of reference for programs revising or establishing PSLOs in their local context.

Because program administrators are hired for a variety of tasks (for instance, among this writing team, we have an author who runs an undergraduate degree program and another who manages the technical writing service course), we recognize the implementation of PSLOs can be a difference of kind, rather than degree. Given these variable contexts, we believe prescriptive language is not, at present, particularly useful for TPC program administrators; for instance, Anderson et al. (2012) reflected on issues related to the use of "writing" vs. "communication" (p. 99). Indeed, some programs focus exclusively on writing, while communication may be the purview of another department and/or discipline; other programs do both. Honoring these differences is an affordance of locally flexible PSLOs informed by data-driven insights from existing TPC programs.

The high frequency PSLOs in the TPC data discussed above align with the large body of research on conceptual and practical skills, given TPC's long-standing relationship connection to a professional field. Toward this end, we echo Anderson et al.'s (2012) call to "emphasize the necessity of adapting [outcomes] to specific institutions" (p. 102). Balancing the field-wide concerns with local exigencies supports programs in preparing students to become critical pragmatic practitioners (Melonçon & Schreiber, 2018) while offering space for them to recognize and practice skills and knowledge that academics and practitioners have identified as vital in the workplace (Brumberger & Lauer, 2015; Stanton, 2017).

TPC program administrators can use this information to understand the malleability of PSLOs so they may fit within all types of degrees, from full degree programs like those discussed here, to certificate programs, minors, and even to courses where expectations are more synthesis-oriented such as capstones or internships. From course to course, and then course to program, PSLOs can be an important programmatic tool to ensure that student learning and program integration remain central to TPC programmatic work.

Considerations as to whether programs should eliminate embedded PSLOs

Embedded outcomes are outcomes that appear to be a single outcome but are actually comprised of multiple outcomes. Here is an example of an embedded outcome from our dataset: "Gather, report, and evaluate information; manage and appropriately document sources; and coordinate complex writing projects in a timely manner" (R1). While these three outcomes are related, additional reflective work is necessary to determine which, if any, of these are actually primary or secondary outcomes, or even tertiary skills student should exhibit to show mastery of an outcome. If we allow that one explicit goal of programmatic student learning outcomes is to provide students an understanding of what they will be moving toward in their learning, and additionally recognize that outcomes should be under-standable to audiences outside of the field (Anderson et al., 2012, p. 102), then we must acknowledge that the use of embedded outcomes is akin to providing learning materials that are not accessible for all students.

The occurrence and value of repetitive outcomes must also be taken into consideration. Repetitive outcomes suggest programmatic emphasis on skills and competencies that are ubiquitous across a program. While creation of outcomes can be a political negotiation amongst faculty with different backgrounds, alignment with institutional goals and/or mandates, and limiting institutional factors, embedded outcomes add complexity. Moreover, how PSLOs are then operationalized in classrooms is less straightforward. We know that PSLOs often overlap and are taught in a relational way rather than as discrete entities. The benefit of writing clear singular outcomes offers ease of assessment and engagement with administrators, and clear communication with students.

Recognizing the utility of PSLOs beyond assessment

In 2003, Carter et al. presented a three-dimensional approach to proactive programmatic assessment where the focus is "not just on educational inputs, but also on educational results." This adds transparency by clarifying PSLOs, determining whether students are meeting them, and adjusting as needed to support students achievement (p. 107). This view, along with Gallagher's (2019) emphasis on consequences, aligns with recent work in TPC that argues assessment is but one small part of a larger programmatic perspective, which "includes considering programmatic relationships: course to course, course to program, program to other academic programs, program to professional field" (Schreiber & Melonçon, 2019, pp. 254–255). Part of a continuous improvement model would be to consistently revisit the PSLOs to determine how well they are working for students, faculty, programs, and external stakeholders. This continuous improvement model aligns with Anderson et al.'s (2012) research on outcomes and their suggestion to align best practices with those involved in programmatic development (p. 103).

Additionally, moving past an assessment only view means that TPC may use PSLOs as a way to help explain programmatic and disciplinary identity and help those outside of the program understand its overall goals. Having a set of outcomes that outline what graduates of a particular TPC program know and can do (and that can be readily and easily shared) is beneficial as a key marker of a program's identity. PSLOs can also be used (in varying forms) for different programmatic stakeholders including multi-disciplinary faculty and campus and community partners involved in the placement of students and graduates in community-based programs, internships, and industry.

PSLOs form an important part of a TPC program's identity since they highlight the framework and orientation for the program, as well as define constraints and limits. Well-considered PSLOs can help administrators more easily and adequately explain what their programs offer students; additionally, PSLOs help our students explain what skills they bring with them to the workplace and how they orient themselves as citizens. Moreover, flexible outcomes give TPC program administrators and faculty a tool to help with curriculum planning and change, as well as program assessment. PSLOs help all involved in curricular decisions to recognize where improvements can be made, and to acknowledge areas in which programs are doing well.

Conclusion

Even though we have not generated a prescriptive TPC outcomes statement from the data, we are able to show what outcomes are presently adopted by TPC programs. In examining PSLOs from 47 undergraduate institutions across the US we gained a better understanding of what programs may value as an emphasis for student learning. The analysis of 376 codes revealed a number of outcome categories that suggest TPC programs do agree on foundational outcomes – *Rhetoric, Writing, Technology*, and *Design* – along with a secondary set of outcomes – *Ethics, Research, Collaboration*, and *Professionalization*. We believe this data may help the field move toward establishing a baseline of programmatic outcomes that can assist TPC program administrators in building, revising, and sustaining their programs.

Anderson et al. (2012) provided an informative synthesis of their team's efforts to build an outcome statement for writing across the curriculum and writing in the disciplines programs noting such a set of outcomes for writing beyond the composition course should not be abandoned (p. 101). Our goal has been to provide guidance based on existing practices but not dictate; we aim to encourage local variation that can be nested within broader disciplinary goals. Therefore, while we encourage further consideration of a broader disciplinary statement like one pursued by Anderson et al., we recognize, too, the complexity of such an undertaking.

Future research could look more in depth at outcomes and how they are being used, as well as chart a longitudinal path on how outcomes change (or not) over time. With ongoing research, PSLOs can serve not only as programmatic development tools but also as data that helps chart the changes within the field – its values and identities. We hope this piece offers a starting place to examine programs holistically with programmatic student learning outcomes representing a dynamic and important part of sustainable programmatic development.

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Disclosure statement

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