

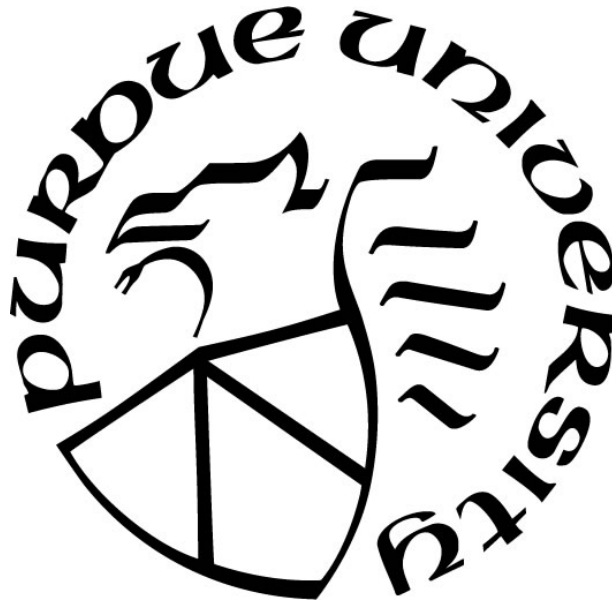
**CIVIC ONLINE REASONING IN FIRST-YEAR COMPOSITION: THE
OUTCOMES OF LEARNING OUTCOMES**

by
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Dedicated to Chachi, again.

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ABSTRACT

Recently, scholars in rhetoric and composition (e.g., Bruce McComiskey) have argued that their field has a key role to play in schools' efforts to fight fake news. This field already engages with questions of how communicators build credibility and persuade audiences, and of how first-year writing courses (which many rhetoric and composition scholars teach) already often focus on skills like source evaluation and critical thinking. Thus, scholars like McComiskey have argued that rhetoric and composition can and should exert an influence on universities' civic education efforts in the 21st century. However, despite an uptick in scholarly interest in fake news, empirical study of whether first-year writing courses impart civic skills is scarce.

An exploratory study examined whether students who take first-year composition courses experience any growth in Civic Online Reasoning (COR) when those courses' learning outcomes invoke the notions of critical thinking, source evaluation, and digital literacy. It also investigated whether students' COR gains differed between course sections and identified curricular features that might contribute to those differences. COR assessments developed by the Stanford History Education Group (SHEG) were administered to students before and after completing a first-year writing course. Participating instructors' course documents (syllabi and major assignment sheets) were also analyzed via a qualitative coding procedure.

Students' scores for the COR component skills of Ad Identification and Lateral Reading increased significantly after one semester of first-year composition instruction. However, students' scores for the Claim Research and Evidence Analysis skills did not improve. Moreover, no significant differences were observed between sections. These results suggested the possibility that, even absent explicit COR instruction, first-year composition courses can impart some COR skill gains, but that the particular approach the instructor uses does not matter much. However, several methodological problems prevented the study from offering firmer conclusions. In addition to making a case for additional research, this dissertation argues that if scholars in rhetoric and composition wish to have a hand in defining universities' approaches to civic education in the future, they should strive to generate robust, generalizable evidence of the benefits of their courses. This will require them to embrace empirical and quantitative methodologies and to engage with work in other fields more frequently.

CHAPTER 1: INTRODUCTION

Influential politicians and scholars have cast American universities as sites where students learn to embody the knowledge, skills, and attitudes of good citizenship for at least as long as the country has existed. In a feature for *Harvard Magazine*, for example, former Harvard deans Ellen Lagemann and Harry Lewis argue that John Adams outlined a vision for the civic role of education in the Massachusetts constitution before the Revolutionary War had even ended:

Wisdom, and knowledge, as well as virtue, diffused generally among the body of the people, being necessary for the preservation of their rights and liberties; and as these depend on spreading the opportunities and advantages of education ... it shall be the duty of legislatures and magistrates, in all future periods of this commonwealth, to cherish the interests of literature and the sciences. (1780, as cited in Lagemann & Lewis 2012)

However, American university campuses have also been battlegrounds: sites for disagreements—often heated—about what good citizenship should entail. Lagemann and Lewis note that the student movements of the 1960s were fueled in part by student activists’ perception that contemporary approaches to general education were “shallow and soulless” and that a return to “common values and social mission” was necessary (2012, pt. 3). Likewise, some culture war controversies of the 1980s and 1990s revolved around whether the traditional liberal arts canon was well-suited to the realities of modern American citizenship, and similar controversies persist into the modern day. Nevertheless, despite disagreements about what civic education should entail, at the end of the 20th century, the broad notion that colleges and universities should produce graduates who are informed, responsible, and open-minded citizens was relatively uncontroversial.

Today, the country’s political realities have brought new urgency to the task of civic education. Questions like “how can we produce greater numbers of conscientious, well-informed citizens?”, “how can we combat the kinds of misinformation that have corrosive effects on national politics?”, and “how can we create civic conditions that foster more productive political dialogues?” now dominate America’s political conversations and media discourses. Additionally, recent survey data suggest that a substantial majority of Americans perceives trust in the federal

government as declining, and they believe increasing this sense of trust is crucial to solving the nation's problems (Pew Research Center, 2019). These developments imbue the work of civic educators with special importance. However, Lagemann and Lewis argue that, as American institutions of higher education have increasingly come to define themselves as institutions of workplace preparation, some of their traditional obligations to the public, including civic education, have fallen by the wayside (2012, para. 7-8). Worse still, the field of rhetoric and composition, which has a history of engagement with matters of civic education and a natural interest in phenomena like misinformation and civil discourse, has not yet exerted a strong influence on universities' responses to the questions presented earlier. If it cannot provide stronger input, the field risks having these questions answered by others who may not share its priorities or values. Moreover, universities will lack the unique contributions of the discipline as they tackle important some of the most pressing political questions of the era, and they will lack these contributions precisely when they would be most valuable to students.

The Present Study

This dissertation takes an initial step toward helping fields like rhetoric and composition make strong arguments about the future of college-level civic education in the 21st century. It seeks answers to the following research questions:

1. Do first-year composition (FYC) courses with learning outcomes that emphasize skills like critical thinking, digital literacy, and source evaluation produce gains in civic literacy skills, even when these courses lack an explicit civic component?
2. If so, do differences in course curricula correspond to differences in students' mastery of these civic literacy skills?

These specific questions both relate to a more general topic of inquiry: what do the projects, readings, discussions, and in-class activities that comprise a typical FYC classroom *do*, in an empirical sense? This dissertation can hardly offer a comprehensive answer to this question, given the enormous variety of interventions that occur within writing classrooms and the diversity of contexts that writing teachers operate within. Instead, it aims to shed light on what a few common approaches to FYC accomplish in a narrow context and with regards to a specific goal: civic education.

To address the two primary research questions, this dissertation describes a study that took place in several first-year composition classrooms at Purdue University during the fall and spring semesters of the 2020-2021 academic year. It argues based on the results of this study that first-year composition courses can indeed produce some observable gains in discrete skills related to civic education. However, the effects of curricular differences between individual first-year composition courses remain ambiguous, and without an explicit focus on the civic skills in question, any gains are likely to be small. In its final chapter, the dissertation argues not only that educators in rhetoric and composition stand to gain by compiling empirical evidence of the skills and competencies their courses impart to students. If educators in these fields can produce reliable evidence that their courses offer students a pathway to clear-headed civic life in a way that students, parents, legislators, and other academic stakeholders find valid, they will have a strong claim to a central role in future civic education efforts. Moreover, if these educators gain greater familiarity with empirical and quantitative approaches to research, they will find it easier to make arguments for their field's enduring relevance. Given that the years since the 2008 financial crisis have seen substantial declines in enrollment for humanities programs at a wide variety of institutions (National Center for Education Statistics, 2017, as cited in Schmidt, 2018), this is an opportunity that educators in rhetoric and composition should not take lightly.

The present chapter introduces most of the themes and ideas that feature in the rest of the dissertation. It briefly provides historical context for present-day conversations about civic education, offers an overview of the project that is the focus of this dissertation, and discusses the concept of “fake news,” which is central to the project. It concludes with summaries of each subsequent chapter.

Defining Civic Education

The term “civic education” is one that suffers from an abundance of definitions. As its *Stanford Encyclopedia of Philosophy* entry notes, civic education does not always even refer to a deliberate program of instruction taking place in a school. Under its broadest definition, civic education can encompass any set of experiences or processes that shape individuals' civic characters. An impoverished childhood, for instance, might constitute a form of civic education. So too could a stint in the military, or participation in an anti-war activist group. The *Stanford Encyclopedia* lists “families, governments, religions, and mass media” as just a few additional

examples of entities that can exert influence over citizens' civic or political development (and thus perform, in a sense, civic education) (Crittenden & Levine, 2018, para. 1). This broad definition of civic education reflects one of the earliest progenitors of modern civic education: the classical notion of *paideia*, which ancient Greeks viewed as the process by which an entire community instilled noble skills and attitudes in its men.

This dissertation, however, defines civic education much more narrowly. In this dissertation, civic education means the set of educational interventions that occur at schools and that aim to teach either:

- 1) content knowledge pertaining to the form and function of government, or
- 2) cognitive skills that aid citizens as they attempt to participate in the various structures and processes of government, like critical thinking, information literacy, and argument analysis.

(except where otherwise indicated). While experiences that occur outside schools can no doubt exert profound influence on citizens' civic lives, the dissertation concerns itself specifically with educational interventions: the experiences teachers deliberately offer to students in order to produce desired effects. Note that this dissertation's definition encompasses activities like service-learning projects, which do not take place within the spatial boundaries of a school but that nevertheless are part of course curricula.

This dissertation occupies itself mainly with the second of the learning outcomes listed above (i.e., cognitive skills that inform adult citizenship). It is less interested in students' content knowledge. Additionally, while this dissertation confines civic education to schools, it does not confine it to civics or political science classrooms. To the contrary, the study that will be described in Chapter 3 investigates whether significant civic education can occur in first-year writing classrooms as well. In FYC courses, skills like critical thinking, source evaluation, and information literacy frequently appear as learning outcomes even though explicit instruction in the minutiae of civic government does not. These outcomes are reflected in influential statements from disciplinary authorities. For instance, the Council of Writing Program Administrators' *WPA Outcomes Statement for First-Year Composition* makes the following statement about an essential outcome termed "Critical Thinking, Reading, and Composing":

When writers think critically about the materials they use—whether print texts, photographs, data sets, videos, or other materials—they separate assertion from evidence,

evaluate sources and evidence, recognize and evaluate underlying assumptions, read across texts for connections and patterns, identify and evaluate chains of reasoning, and compose appropriately qualified and developed claims and generalizations. These practices are foundational for advanced academic writing (2014).

The *Outcomes Statement* proceeds to note that one vital aspect of this outcome is for students to gain competency gathering reliable information from “informal electronic networks and internet sources” (2014). Thus, the study in this dissertation is in one sense an investigation of whether these course- and discipline-level learning outcomes are reflected in observable changes in student behavior.

Speaking generally, the constituent parts of the American educational system tend to also treat civic education as a set of discrete curricula and interventions (i.e., as something that happens in schools). As of 2012, all 50 states have set formal standards for civic education as part of their social studies curricula (Godsay et al., 2012). Scholars have even claimed that the wording of the United States constitution obligates schools to provide a civic education to their students (Rebell, 2018, cited in Crittenden & Levine, 2018). In the case of both state and federal governments, of course, mandates to teach civic education extend only to interventions occurring in (and on behalf of) schools. They do not extend to the educative experiences of everyday life that would fall well outside the purview of legislators or school boards (much less their ability to regulate such things).

Civic Education in the American University

How did school systems in America come to view civic education as an essential part of schooling? The prolific American philosopher and educational reformer John Dewey did more than perhaps anyone else in the 20th century to popularize the idea that schools can (and should) teach students to be good citizens. In a decades-spanning range of works that includes books, articles, and essays, Dewey argued that democratic citizenship and education are inherently linked. *Democracy and Education*, Dewey’s most influential statement on this relationship, describes the school as a place where students learn skills and attitudes vital for democratic self-government. While vocational skills have their place in Dewey’s ideal education, more important for civic life are general cognitive skills that transcend narrow utilitarian purposes. Van der Ploeg notes that these include skills like open-mindedness and creativity, as well as an

appreciation for realms of learning beyond those that are strictly utilitarian (i.e., education in subjects like the humanities) (2019, p. 4).

However, most important of all is the skill of thinking itself, which, when fostered through education, lends a clarity of judgment that allows students to guide all their other skills toward beneficial ends. Dewey argues that teaching good habits of thought creates independent, self-assured citizens—the constituent units of a healthy democracy. “Skill obtained apart from thinking ... leaves a man at the mercy of his routine habits and of the authoritative control of others, who know what they are about and who are not especially scrupulous as to their means of achievement” (Dewey, 2008, Ch. 12, pt. I). Simultaneously, Dewey, whose educational philosophy emphasized the key role of experience in student learning, argued that school curricula should mirror the experiences of everyday life. “Every recitation in every subject gives an opportunity for establishing cross connections between the subject matter of the lesson and the wider and more direct experiences of everyday life,” wrote Dewey (2008, Ch. 12, pt. 1). The social and political experiences of everyday life in democracies were, in Dewey’s view, no exceptions. Because Dewey characterized democratic societies in terms of the freedoms they grant individuals, he believed that schools need to prepare students for democratic citizenship by helping them develop and express thoughts freely. This—the fostering of individuals’ unique intellectual identities—was, to Dewey, the bedrock of healthy democratic life. “A progressive society counts individual variations as precious since it finds in them the means of its own growth. Hence [it must] allow for intellectual freedom and the play of diverse gifts and interests in its educational measures” (2008, Ch. 22, pt. 3).

While Dewey’s definitions of productive democratic citizenship are not necessarily shared by all modern scholars of education, by the early 21st century, Dewey’s notion that schools have an obligation to teach their students the skills and attitudes of good citizenship had become widespread. For example, in her influential book *Democratic Education*, Amy Gutmann acknowledged a philosophical debt to Dewey even as she attempted to offer a new vision for civic education (1999, p. 13). Gutmann, like Dewey, claimed not only that school curricula should reflect democratic values, but also that education has a crucial function in maintaining democracy: “Education not only sets the stage for democratic politics, it plays a central role in it” (1999, p. 3). Similarly, as proponents and critics of *Democratic Education* alike have noted (see, e.g., Corngold, 2011; Yudof, 1989), Gutmann identified “conscious social reproduction” (the

ability of individual citizens to exert control over their society's future through political choices) as the primary goal of democratic education (Gutmann, 1999, p. 39). While Dewey does not use this precise phrase, he nevertheless cast education essentially as a process of social reproduction, likening it to reproductive processes in nature:

Mere physical growing up, mere mastery of the bare necessities of subsistence will not suffice to reproduce the life of the group. Deliberate effort and the taking of thoughtful pains are required. Beings who are born not only unaware of, but quite indifferent to, the aims and habits of the social group have to be rendered cognizant of them and actively interested. Education, and education alone, spans the gap. (Dewey, 2008, Ch. 1, pt. 1)

It is important to note that Gutmann's theory of democratic education was not identical to Dewey's. As Gutmann herself observed, her theory differed from Dewey's by espousing a truly majoritarian approach for education. Whereas Dewey privileged the judgments of especially intelligent citizens in setting educational policy ("What the best and wisest parent wants for his own child, that must the community want for all of its children" (Dewey, 2017, Ch. 1)), Gutmann argued that educational agendas should always reflect the will of voters, even if the agendas that earn their consent would not strike intellectual elites as especially wise. Nevertheless, Dewey's influence is abundantly clear in Gutmann's efforts to theorize education as both the foundation and product of democratic self-governance.

Gutmann is not alone in taking Dewey's notion that education should support democracy as given. Scholars offering a variety of perspectives and prescriptions (including but not limited to Clayton, 2006; Macedo 2000; MacMullen, 2015; and Merry, 2018) have identified civic education as a core feature of modern democratic society and as a primary goal of public school systems in general, if not their single most important function. Unsurprisingly, Deweyan attitudes toward civic education have also become commonplace in university classrooms and boardrooms. Musil (2003) argues that the widespread adoption of citizenship education in institutions of higher learning at the end of the 20th century constituted "a quiet revolution" (para. 1), with the newfound popularity of community engagement serving as a particularly visible example of this new and widespread emphasis on good citizenship. Musil notes that, at the time of writing, "a thousand college presidents are members of Campus Compact, an organization created to promote greater campus-community involvement." A national report by the Association of American Colleges and Universities (AACU) identified civic, social, and personal

responsibility as constituting one of six learning outcomes that make up a national consensus for the goals of undergraduate education (2004).

Conflicting Visions of Civic Education in the 21st Century

Yet despite the general popularity of civic education, some evidence suggests that the appearance of consensus may mask drastically different opinions about how colleges should perform their civic education duties and what form that education should take. Notably, the task of producing responsible citizens ranks among schools' explicit objectives less frequently than the AACU's claims of consensus might suggest. A 2006 survey of the mission statements for the 331 institutions in Princeton Review's annual *Best Colleges* ranking found that only approximately one sixth of surveyed colleges made explicit mention of citizenship in their missions (Meacham & Gaff, 2006, p. 9). "Social responsibility" appeared in only roughly one quarter of schools' missions; the vague notion of "contributing to community" appears in less than half.

Recently, scholars have also subjected "consensus" approaches to citizenship education to two conflicting strains of criticism. Some scholars claim that current approaches are insufficiently radical because, by privileging civility and narrow conceptions of political propriety, they stymie democratic change. For example, Merry (2018) criticizes what he describes as the mainstream liberal stance toward citizenship education offered by Gutmann (1999). Merry argues that Gutmann's approach inculcates students with the idea that political dissent within a democratic system must exist within established norms of acceptability. Those norms, says Merry, necessarily exclude some ideas and forms of dissent that challenge existing power structures too greatly. "Liberal dissent appears to imply little more than respectful disagreement with a particular policy, or set of policies, favored by a ruling political party," writes Merry, "but dissent is never construed as principled opposition to the existing economic and political order" (2018, p. 128). James Banks, another critic of mainstream approaches to civic education, has echoed several of Merry's concerns: "schools have contributed to failed citizenship by using assimilationist approaches to civic education that required minoritized students from diverse groups to deny their home cultures and languages," Banks writes (2017, p. 367).

While scholars like Merry and Banks question whether mainstream approaches to civic education are sufficiently radical, others argue essentially the opposite: that they are already so radical as to be censorious and undemocratic. Admittedly, some of this criticism is the exaggerated or misleading sort frequently offered by cable news pundits. A typical example of this would be Fox News pundit Tucker Carlson's false claims in 2018 that Purdue University had forbidden students from using the word "man" in an instance of political correctness run rampant (see, e.g., Forte 2020). However, a small but vocal contingent of academics have also argued that conservative ideas and/or religious beliefs are systematically excluded from institutions of higher education (see, e.g., Smith et al., 2008; Yancey, 2011). These arguments have often themselves been subject to rebuttal (for a scholarly example, see, e.g., Bérubé, 2007). However, recent evidence suggests they have nevertheless proven persuasive to certain segments of the population. Research by Pew finds that a sharp change in the opinions of Republican voters occurred around 2015: In 2017, 58% of these voters reported that colleges have a negative influence on the country; in 2010, the same percentage reported that colleges have a positive influence (Pew Research Center, 2017a). Similar findings appear in other Pew studies (see, e.g., Pew Research Center, 2017b, 2018).

The repercussions of this apparent shift remain to be seen. However, because public university budgets are dictated in part by state legislatures, one conceivable worst-case outcome is decreased funding for universities, with the steepest cuts occurring in the most conservative states. Some commentators have noted that institutions of higher education have already begun to endure such cuts, and that COVID-19 has exacerbated this process. Hockett and Howland, for instance, identify a handful of institutions that have eliminated or drastically reduced programs in fields like the humanities and natural sciences, calling these instances examples "of a nationwide trend away from a traditional understanding of education ... and toward professional training and skill certification that cater to the needs of businesses" (2020). The question of whether state legislatures themselves have already begun to deinvest in public education is subject to disagreement, however, with one recent report finding decreased state funding responsible for tuition increases and a competing report finding that per-student state funding has actually increased since the 1980s (Seltzer, 2019).

In sum, despite widespread agreement that civic education is an important and worthwhile goal, turn-of-the-millennium "consensus" attitudes toward civic education are now

increasingly subject to criticism, and this criticism itself contains drastically different visions for what the future of civic education should look like. Desire for change is abundant; agreement on what form that change should take is not. Disagreement over the status of civic education extends not only to clashing philosophical/ideological visions, but also to more practical concerns. For instance, the question of how civic educators should adapt their work to an increasingly digital society is still a matter of open debate. While a number of scholars appear to at least agree that factors like digital propaganda and misinformation pose major challenges to civic education efforts (see, e.g., Hodgin & Kahne, 2018; Journell, 2019; Kahne & Bowyer, 2017; Kloubert, 2018; Lewandowsky et al., 2017), there is as of yet no consensus on how best to overcome these challenges. Some voices argue for a return to older educational paradigms. For example, Westheimer (2019) argues that recent reform movements at the primary and secondary school levels emphasizing standardized curricula and assessments have given teachers myopic incentives: namely, incentives to ignore hard-to-assess qualities like critical thinking and creativity in their curricula. In response, Westheimer argues for a future in which teachers “teach students how to ask questions, expose students to multiple perspectives, and root instruction in local contexts” (2019, pt. 5). By contrast, other voices look to grapple head-on with the modern digital media that tend to be associated with phenomena like fake news by explicitly teaching students how to engage with these topics. In a large-*n* study of high school students, for instance, Kahne and Bowyer detail the affordances of both *digital engagement learning opportunities* (i.e., learning how to produce digital media about societal issues) and *digital consumption learning opportunities* (i.e., learning how to judge the credibility of digital media), finding that the latter are positively related to offline civic engagement (2020). The next chapter discusses a few more differing perspectives on civic education, including the works of writing studies scholars (e.g., Minnix, 2017) and influential theorists (e.g., Fish, 2017).

One trend that reviewing the disparate opinions on civic education reveals is that, barring some notable exceptions, systematic, empirical study of this topic is rare, given the importance researchers typically ascribe to the matter. This is a discouraging trend. Ongoing disagreements about civic education could be settled more easily if scholars had a firmer understanding of how to teach the civic skills and values that are already broadly agreed upon. For instance, as noted above, a number of scholars have identified digital misinformation and propaganda as key matters of concern for modern civic educators. Despite this, a comprehensive body of research

exploring how to teach students to decipher the truth from harmful fictions and to ensure they are indeed learning has proven elusive (though, as the next chapter will document, some encouraging efforts, like those of the Stanford History Education Group, have already borne fruit). A hesitance to prescribe certain values or ideologies may be partly to blame: modern scholars of civic education may be more wary than Dewey of assuming they know what the “best and wisest parents” would want for their children. Here, again, however, a greater preference for empiricism would be particularly fruitful. Not only would empirical tools lend greater specificity and certainty to research findings, but also produce findings that are more generalizable outside of local educational contexts and less reliant on individuals’ moral judgments. Given the diverse tapestry of American civic life, which encompasses innumerable local circumstances, cultures, ideologies, and values, the latter quality is especially important.

An Opportunity for Action

Today, scholars with a stake in the future of civic education face a host of unanswered questions. These range from the general (“Are current approaches to civic education too radical, not radical enough, or ‘just right’?”) to the specific (“How should civic educators address digital misinformation in the classroom?”). It is difficult to think of an historical moment that lends greater importance to these questions’ answers, as the notion of citizenship is central to a number of important ongoing political conversations. Banks notes that many of these conversations are motivated by increased attention—both positive and negative—being paid to issues of migration, globalization, and diversity across the developed world (2017). Writes Banks,

The challenges of inclusion and citizenship within Western nations have been manifested in recent years by the conflicts between police officers and communities of color and the Black Lives Matter Movement (BLM) in the United States, the large number of people from nations such as Syria and Iraq who have fled their homelands seeking refuge in European nations, and the terrorist attacks that occurred in cities such as Paris and San Bernardino, California, in 2015, and in Manchester and London, England, in 2017 (2017, p. 366).

The decade ending in 2019 also saw the phenomenon known as “fake news” become embroiled in conversations about all of the issues mentioned in the passage above. Intense disagreements about how nations ought to extend the privileges of citizenship were (and

continue to be) complicated both by deliberate disinformation efforts and sincere disagreements about matters of fact. The idea of fake news eventually became so prominent in American media discourses as to become an object of intense fixation and argument in its own right. In the wake of the 2016 American presidential election, for example, anxieties about fake news appeared to be considerable. A Pew Research Center study that immediately followed the election found 64% of American adults believed that false or misleading news stories caused “a great deal of confusion” about current events (2016). This sense of anxiety does not appear to have abated in the years since the election: a 2019 survey found 47% of Americans believed that it was “somewhat” or “very” difficult to verify the information they encountered on a day-to-day basis (Associated Press-NORC & USAFacts, 2019). Moreover, though the American election may have played some role in sparking these anxieties, they are not unique to America. According to a 2019 Pew study of social media users in a variety of developing countries, for example, “majorities [of respondents reported] at least occasionally seeing content that seems obviously false or untrue or that makes them feel negatively about groups different from them” (Pew Research Center, 2019).

In short, fake news has provoked intense emotions across all strata of society. Recent events suggest that anxiety is not unjustified. If the immediate dangers of fake news were in doubt before January 6th, 2021, pessimists’ worst fears about fake news were seemingly realized when angry supporters of outgoing president Donald Trump stormed the United States Capitol to contest the results of an election for which there was no significant evidence of impropriety.

Unanswered questions about how civic education should feature in university curricula gain a disquieting sense of urgency in light of events like the January 6th riot. These events illustrate the frightening consequences of American society’s failure to grapple with new (and sometimes unreliable) sources of information that have supplanted traditional media. More broadly, they suggest a generational failure to establish a notion of shared democratic destiny—to ensure that citizens in our democracy believe themselves to have obligations to one another that transcend myopic partisan goals. Thus, these events posit a new mission for future civic education efforts: rebuilding a communal civic ethos, rather than merely maintaining it.

Some of these problems cannot realistically be addressed by university educators. While the most successful college professors may enjoy cultural and intellectual cachet far greater than that of the average citizen, they cannot, in their capacities as educators, exert much influence

over the political realities that have almost certainly contributed to events like the one that occurred on January 6th. Foa and Mounk (2016) note that, at the time of their writing, the approval rating for the United States Congress stood at a mere 13 percent and suggest that widespread dissatisfaction with legislative outcomes bolsters the arguments of antidemocratic politicians like (then-candidate) Donald Trump. Professors, obviously, have little more control over Congress than any other citizens. Similarly, research has produced some evidence that demand for the privileges of democratic citizenship may be on the wane at the grassroots, and particularly among young people. One recent study found that a quarter of American young people viewed democratic government negatively (Foa & Mounk, 2016); another piece by the same researchers found that a significant majority of American millennials did not view the right to choose leaders via free elections as essential (Foa & Mounk, 2017). This shift is almost certainly not college educators' fault, and it is unlikely that the efforts of college educators alone can reverse it.

Nevertheless, today, educators and administrators have an opportunity to change civic education for the better by pushing for new approaches that are proven to reliably foster the skills needed for responsible citizenship in the 21st century and to address new challenges to civic society like fake news. Both groups of stakeholders stand to benefit considerably. Teachers stand to benefit by no longer wasting time and energy on approaches to civic education that do not work well in the context of the modern social, political, and media landscapes. Teachers who can credibly claim that they help their students navigate these landscapes may not only experience the satisfaction of seeing their students do just that but may also distinguish themselves as professionals. Administrators stand to benefit from improved approaches to civic education because many parents have an interest in seeing their children become thoughtful, conscientious adults. Those parents who are concerned about the emergence of hitherto unthinkable trends in national politics, like the apparent viability of politicians who present themselves as quasi-authoritarians, may find the notion of their child attending a university offering a cutting-edge approach to civic education to be an attractive proposition. Of course, it should also go without saying that students stand to benefit most of all from more effective civic education efforts, as the skills of citizenship are precisely the skills that will allow them to exert influence over their own political destiny.

Some evidence already exists that academics are taking phenomena like fake news as a significant threat to civil society, and, moreover, as a threat they have a duty to address. For example, in a recent survey of faculty members at California State University, Northridge, overwhelming majorities of respondents indicated they “agreed” or “strongly agreed” with the idea that fake news was important to them (Weiss et al., 2020). Similarly, scholars in library and information sciences have documented a surge of activity in their field that appears to be a response to the emergence of fake news. One author writes that, by the end of 2017, professionals in the field had produced over 7,000 online resources designed to address fake news specifically and over 15,000 pages with a more general focus on critical thinking or discipline-specific information literacy practices (Todaro, 2018, ix). Additional fake news research originating in fields like rhetoric, writing studies, and library and information sciences is discussed at length in the next chapter.

While the apparent surge in scholarly interest in fake news and associated phenomena is encouraging, more systematic and focused efforts stand a greater chance of producing the practical knowledge that will guide civic educators as they confront the challenges that now face them. For example, scholars of civic education will eventually need to make difficult decisions about what “counts” as civic education in the third decade of the 21st century, as well as how best to teach the things that “count,” given the realities of limited time and resources that college educators invariably face. If these decisions are to be based on strong evidence and not (to give just one possibility) the whims of state legislatures, research must play a crucial role. Academics must seek reliable information about which educational interventions produce the learning outcomes they associate with good citizenship. Familiar Deweyan values of critical thinking, open-mindedness, creativity, and the like would probably rank among these, in addition to easier-to-define-and-measure outcomes like content knowledge of civic institutions and political processes. New skills that Dewey could not have predicted, like the ability to responsibly uses modern digital media platforms might also play a role (and this dissertation argues that they should).

Regardless of the outcomes they choose, however, educators with an interest in seeing civic education flourish in American universities must also to find ways to demonstrate that those outcomes are being produced. Fortunately, they do not need to start from scratch when they do this: a variety of psychometric tools exist for measuring a range of educational outcomes

including abstract traits like critical thinking. Researchers have even produced tools specifically designed to measure various component skills of good citizenship. The Civic Online Reasoning (COR) assessment developed by the Stanford History Education Group, which features prominently in this dissertation, is just one notable example. Tools like this can allow educators to determine whether new educational interventions proposed for their courses actually teach students how to be responsible citizens in terms of well-defined, measurable outcomes. This knowledge should be fundamental to any decisions about how to change the way universities teach the skills of citizenship.

In addition to helping educators determine the suitability of new educational interventions, psychometric tools like the aforementioned COR assessment can also help them determine whether current, existing interventions are producing desirable effects. This knowledge, in turn, can help educators and administrators determine *where* civic education should take place in the university. For example, if educators can demonstrate that certain courses already impart skills that are central to responsible citizenship, educators can work with administrators to make those courses central to future civic education efforts (for example, by making them part of general education curricula and/or seeking out educators with experience teaching these courses for guidance in emphasizing desirable learning outcomes).

This dissertation argues that one appropriate place for these interventions to occur is the FYC classroom. First-year composition courses (which are also sometimes referred to with the terms “first-year writing,” “freshman writing,” “freshman English,” and similar names) feature commonly at university campuses across the nation. These courses, which, as their name suggests, are usually intended for those new to college, teach students the writing skills and genre conventions that allow them to flourish in university-level courses. They also frequently—though not always—encompass some discussion of civic issues (for example, they may do this as part of a course project that requires students to write about challenges facing the local community). Some first-year composition courses even have an explicit community service or public writing component. Most importantly, first-year composition courses frequently claim learning outcomes that are often cast as component skills of good citizenship, like critical thinking, the ability to seek out and consider a variety of perspectives on a given topic, and information evaluation skills.

Scholars in English sub-disciplines that frequently engage with first-year composition pedagogy, like rhetoric and composition, have made great strides in advancing academic understandings of how first-year composition courses affect students' intellectual, moral, and emotional development. Just as crucially, these scholars have also explored how the traits that students bring to first-year composition classrooms—traits like their educational background, socioeconomic status, race, and gender, as well as—affect the degree to which they thrive within those classrooms. However, this progress is not without its caveats. As the next chapter demonstrates, these subfields do not use tools like psychometric assessments (or even quantitative analyses more generally) very frequently in their research. This dissertation argues that the field's distaste for these sorts of tools has left it ill-prepared to affect the future of civic education in American universities. This has potential repercussions beyond the discipline of English. One worst-case scenario that could occur if these fields cannot offer strong claims about civic education is that universities may simply abandon the task altogether, seeing it as too risky or controversial to justify ambiguous results. This would represent a loss not only for students and educators, but also for the body politic, as subsequent generations of students would leave university less prepared to participate in democracy.

Focal Project: COR Analysis

This dissertation centers around a research project carried out during the 2020-21 academic year at Purdue University. The project assesses the change in Civic Online Reasoning (COR) among students enrolled in an FYC course at Purdue University over one semester. COR is a construct that represents a subject's ability to distinguish between true and false information online. It was developed by researchers at Stanford University between 2017 and 2018 based on research into the behavior of professional fact-checkers (McGrew et al., 2018). The construct was originally conceptualized as a subset of the broader domain of media literacy (Wineburg & McGrew, 2019). This connection is still acknowledged in the most recent research, though the developers of the construct now articulate COR in terms of three core competencies, or questions ("Who is behind this information?", "What is the evidence?", and "What do other sources say?"), and four cognitive tasks (Ad Identification, Lateral Reading, Evidence Analysis, and Claim Research) (see, e.g., McGrew, 2020). Currently, COR is the central theme of a free curriculum offered by the Stanford History Education Group (SHEG) designed to help educators

impart the skills of online citizenship. The precise conceptual structure of COR is discussed in greater detail below.

In this project, COR was assessed via constructed-response items designed by the Stanford History Education Group to measure student performance in a variety of COR-related skills. This assessment was administered during the first two weeks of the course and again in the final two weeks of the course (in a parallel form) in order to measure student COR growth over the course of the semester. Following this, the instructors of participating courses submitted their syllabi and assignment sheets for analysis via a descriptive coding scheme. This analysis linked themes, activities, readings, and assignments in instructors' curricula to students' performance on the COR assessment and thereby identified curricular characteristics that might be associated with changes in COR. Future research will determine whether any of the curricular features identified in this study have a causal relationship with any observed COR gains.

This project was developed not only in response to general public anxiety about fake news, but also factors particular to Purdue University. In 2019, Purdue president Mitch Daniels requested that the University Senate begin considering options for an undergraduate civic education requirement. In June 2021, Purdue's Board of Trustees approved a version of this requirement for undergraduates who begin their study in fall 2021 or later (Purdue University Provost's Office, 2021). While many higher educational institutions have civics requirements, the model currently planned for Purdue has attracted attention since its announcement because it would require undergraduates not only to pass a civics test, but also to demonstrate their proficiency in one of several other ways (Flaherty, 2020). As of July 2021, this second requirement can be satisfied by taking one of several approved courses focusing on American history or government, listening to a series of 12 podcasts produced by the Center for C-SPAN Scholarship & Engagement at Purdue University, or attending six approved civics-related events on campus. Daniels' civic literacy program was (and remains) controversial on campus. The Purdue University Senate voted down the civics literacy proposal in 2020, with some faculty citing concerns like redundancy with the civics requirement already in place for Indiana high schools and the lack of substance in the proposed curriculum (Flaherty, 2021). Following further debate in the Senate, in April 2021, Purdue's Board of Trustees announced its intention to adopt the requirement anyway. While the success of Purdue's civics literacy requirement currently

remains to be seen, the announcement of the program spurred initial interest in this project, and any data produced from its future implementation will be of great interest to the author.

Understanding Fake News

COR was developed in large part as a response to the perceived danger of online misinformation and fake news. Writes Sam Wineburg, founder and director of SHEG, “Never has so much information been at our fingertips as it is today. Whether this bounty will make us smarter and better informed or more ignorant and narrow-minded will depend on one thing: our educational response to this challenge” (n.d., para. 2). This dissertation shares the view that schools can and should seek better means of preparing students to navigate digital information ecosystems with confidence and thoughtfulness.

Unfortunately, scholarly definitions of “fake news” can encompass a wide range of behaviors and media, complicating study of the phenomenon. The study in this dissertation combines the definitions used by Marwick & Lewis (2017) and Caplan et al. (2018) to create its own fairly narrow definition. In the context of the study, “fake news” refers to *misinformation and disinformation related to people and issues of political import that occurs in a form that can be shared on social media*. Note that this definition excludes non-digital fake news (e.g., deceptive tabloid articles) but includes misleading digital news content that is not deliberately intended to deceive (e.g., online news stories that, due to negligent journalistic practices, contain false information). In sum, this study focuses solely on digital fake news, albeit in a variety of forms.

This distinction is necessary for several reasons. The first is that the assessment instrument used in this study derives from research (e.g., McGrew et al., 2018) that engages specifically with fake news in the forms that students are likely to encounter online. Moreover, the items on the assessment use examples of online fake news exclusively. Thus, the quantitative portion of this study only captures students’ ability to identify fake news online, and it cannot necessarily be used to make similar inferences for students’ ability to identify fake news offline. A second reason for focusing solely on online fake news in this study is that young students tend to rely on social media as their primary source of news information (Leeder, 2019). For this reason, focusing on the kinds of fake news that are available in shareable digital forms is a straightforward way to make assessment tasks as authentic to students’ real circumstances as

possible. Finally, the decision to engage primarily with online media puts this dissertation project into direct conversation with a growing body of literature focused on this specific media domain. For example, a handful of intervention studies performed in the past decade have sought to determine whether educational instruction can improve students' ability to evaluate online information (see, e.g., Kammerer et al., 2015; Walraven et al., 2013; Zhang & Duke, 2011). While this project is not a traditional intervention study, it is designed so that its results would suggest directions for a series of future intervention studies. Thus, limiting the scope of this project to online media helps ensure that these future studies will be able to contribute to this vital body of literature.

Origins and Definitions of Fake News

It is difficult to begin a conversation about fake news without reference to former President Donald Trump. Trump did not invent the idea of fake news, despite his claims to have done so (e.g., during a 2019 press conference). However, given the size of his public platform and the relentless media coverage of his campaign and presidency, he is likely more responsible than any other living person for making fake news a prominent and enduring topic of public conversation today. While Trump did not use the precise phrase “fake news” during most of his major 2016 campaign speeches, Trump frequently denounced the press as biased and corrupt using more general language, portraying it as one branch of a power elite conspiring to stymie changes that would benefit ordinary Americans. During his nomination acceptance speech at the 2016 Republican National Convention, for instance, Trump decried “carefully-crafted lies” and “media myths” and suggested an alliance between “elites in media, and politics, who will say anything to keep a rigged system in place” (2016a, paras. 9 & 34). At an August 2016 campaign event, Trump echoed similar notions: “The insiders ... include the media executives, anchors and journalists in Washington, Los Angeles, and New York City, who are part of the same failed status quo and want nothing to change,” continuing, “The media-donor-political complex that’s bled this country dry has to be replaced with a new government of, by and for the people” (2016b).

After assuming office, Trump began to use the phrase “fake news” (alongside similar pejoratives like “phony” and “rigged”) much more frequently to describe not only news stories that he believed to be false, but also stories that he believed merely to be critical or unflattering.

In many cases, Trump used his personal Twitter account to disseminate these kinds of accusations (and, for this reason, some of Trump's accusations of his media detractors themselves meet this dissertation's definition of fake news). An illustrative usage occurred in a May 2018 tweet that several prominent journalists argued made Trump's strategy of casting any critical coverage as "fake" explicit (see, e.g., Bump, 2018; Chait, 2018; Cillizza, 2018):

The Fake News is working overtime. Just reported that, despite the tremendous success we are having with the economy & all things else, 91% of the Network News about me is negative (Fake). Why do we work so hard in working with the media when it is corrupt? Take away credentials? (Trump, 2018)

Trump's use of "fake news" during his presidency extended beyond social media: for example, during a 2018 press conference in the UK, Trump justified his refusal to answer one journalist's question by saying, "CNN is fake news – I don't take questions from CNN" (McCarthy, 2018). Several members of Trump's administration also adopted language and lines of attack that mirrored the president's in their public statements as well. To provide just a few examples: Secretary of State Mike Pompeo referred to a reporter as part of an "unhinged" media establishment seeking "to hurt President Trump and this administration" (Luscombe, 2020); alleging deliberate censorship of information that would hurt then-candidate Joe Biden's campaign, Trump's lawyer Rudy Giuliani claimed that "big tech and big media are what [Trump] says – the enemy of the people" (RT, 2020); referring to allegations of Russian interference in the 2016 election, then-Deputy Press Secretary Sarah Huckabee Sanders claimed that "the constant barrage of fake news directed at [Trump] has garnered a lot of his frustration" (McCaskill, 2017).

However, while Trump and members of his presidential administration were instrumental in *popularizing* the phrase "fake news," they are not the only figures to *define* it. A number of politicians and media figures have offered a competing definition for "fake news": erroneous, propagandistic content, often shared digitally, designed to lend credence to conspiracy theories or advance the aims of bad-faith political actors. Under this definition, Trump and his prominent supporters—not conspiracies of elite journalists and media figures—have been portrayed as peddlers of fake news themselves. Notably, following her 2016 defeat, Hillary Clinton decried "the epidemic of malicious fake news and false propaganda that flooded social media over the past year," a possible reference to the sort of misleading digital content that led a man to

brandish a rifle in a Washington, D.C. pizza restaurant, believing the restaurant to be a front for a pedophilia ring in which Clinton participated (Wendling, 2018). Journalists have also characterized online claims that the results of the 2020 election had been predetermined or altered after the fact as “fake news” (see, e.g., Spring, 2020). Similarly, mainstream news outlets have used the phrase to tag stories about COVID-19 conspiracy theories (see, e.g., Goodman & Carmichael, 2021).

These are the two uses of “fake news” that predominate today: on the one hand, mainstream news content that betrays biased and elitist motives, and on the other, misinformation designed to benefit demagogues and conspiracy theorists. However, despite the recent explosion in popular usage coinciding with these two definitions, the phrase itself is not a modern invention. Though its precise origins are unknown, the phrase was in general use by the late 19th century at the latest, as its appearance in newspaper records can attest. Even these early instances of the phrase appear to connote phenomena and emotions similar to those that the phrase does today. For example, headlines like “Secretary Brunnell Declares Fake News About His People is Being Telegraphed Over the Country” (*Cincinnati Commercial Tribune*, 1890, as cited in Merriam-Webster, n.d.) use the phrase in a way that would likely be understood by any modern reader. Still older evidence of similar phrases can be found: one Renaissance writer, for instance, bemoans the fact that “cruel lies [and] false news ... have such abundance in this Court” (Guevara, 1575, as cited in Merriam-Webster, n.d.).

These early usages, which obviously predate social media, demonstrate that the phrase “fake news” does not necessarily connote a particular medium on its own. However, there is some evidence that fake news flourishes on modern social media platforms more readily than in other environments. Research suggests that fake news spreads quicker than real news on social media (Vosoughi, Roy, & Aral, 2018) and that the commentary or personal information that often accompanies news content on social media can prime readers to interpret that content in a particular way. In one study, subjects who read posts from elite cultural figures about fake news could not distinguish fake news from real in a subsequent exercise (Van Duyn & Collier, 2019). Social media users may also gain a distorted view of what is real and what is false when their connections are ideologically homogenous. In the words of Huckfeldt et al. (2004), “homogeny can make acceptance of a falsehood appear socially ‘normal’ by decreasing the visibility and familiarity of contradictory information” (as cited in Scheufele & Krause, 2019, p. 7665).

Moreover, social media platforms and the audiences that rely on them may be especially susceptible to fake news. The process of “sharing” a piece of news with one’s social media peers decontextualizes it from its original source, allowing false stories to easily be conflated with true ones (Chen et al., 2015). Scholars of economics have also suggested that fake news spreads easily on social media because social media platforms make fake news profitable. “True” online news content is more expensive to produce, must abide by standards that limit the kinds of headlines and stories that editors can run, and often demands some effort or payment for readers’ access. By contrast, fake news is cheap, can be produced quickly, and can promote itself by way of an outrageous headline or the promise of salacious content. (Allcott & Gentzkow, 2017).

As noted above, one reason the phrase “fake news” can be difficult to define is that, in popular usage, it is often used to refer to a broad spectrum of news or news-like content that is misleading, propagandistic, or outright false. For this reason, it behooves researchers to opt for scholarly definitions that have been based on some systematic conception of information, media, rhetoric, and/or human cognition. Recent scholarly efforts to study fake news have produced a handful of descriptors that are valuable for distinguishing fake news from other kinds of untrue information. These include the following examples.

- Allcott & Gentzkow (2017) narrowly define fake news as “news articles that are intentionally and verifiably false, and [that] could mislead readers” (p. 213). The authors explicitly exclude news sources with unintentional errors, rumors that do not originate from any particular piece of news, conspiracy theories, satire that is unlikely to be taken seriously, false statements by politicians, and news reports that are misleading but not outright false from this definition. However, satire that mimics the appearance and style of real news and might reasonably be misinterpreted by readers does qualify as fake news.
 - Similarly, Leeder (2019) defines fake news as “those [news stories] that are fabricated with the intention to deceive viewers into thinking they are real news” (p. 2).
- Marwick & Lewis (2017) define fake news as a type of content that encompasses both *misinformation* and *disinformation*. The former term refers to content that is misleading or even false, but not intentionally deceptive. The latter refers to content that is “explicitly created and designed to deceive people, publishing provably false claims” (p.

44). The authors also acknowledge that some fake news may occupy a middle ground between these two extremes.

- Caplan et al. (2018) describe fake news as “particular types of problematic or harmful content spread over social media networks” (p. 8). This definition is notable because it hinges on the effect (harm) and medium (social media) of fake news content. However, the authors proceed to acknowledge the lack of clear scholarly consensus on the precise meaning of “fake news.”

Other researchers have attempted to synthesize these sorts of diverse scholarly perspectives on fake news into unified definitions or set of qualities. Two such syntheses are described below:

- Tandoc et al. (2018), in a review of studies centered on fake news, observe significant variation in definitions of the term. However, they also find that a common factor shared across many definitions is that fake news sources make deliberate efforts to mimic the formal features of real news. “What is common across these definitions is how fake news appropriates the look and feel of real news; from how websites look; to how articles are written; to how photos include attributions” (p. 147).
- Caplan et al. (2018) offer a helpful review of scholarly fake news definitions, noting that many scholars tend to define fake news either in terms of a) its intent, b) its content, or c) its features and/or data schema (p. 9).
 - Approaches that define fake news in terms of its intent tend to do so in order to distinguish it from content that is merely negligent or mistaken. Such approaches typically employ descriptors like “news content that is intentionally false” or “intentionally written to mislead readers” (Shu et al, 2017, p. 2). While intent-focused definitions are useful for separating malicious items of fake news from those sources which are merely biased or poorly composed, Caplan et al. (2018) argue that it is often difficult to firmly determine an author’s intent in online contexts.
 - Attempts to define fake news in terms of its content tend to draw distinctions between various categories of news-like content in order to examine one or more narrow genres of interest. Such definitions often use descriptive genre typologies to differentiate between, e.g., satire, hoaxes, clickbait, propaganda, and fabricated

news. However, Caplan et al. (2018) again note that the distinction between certain types of content ultimately may mainly relate to intent, and that intent can be difficult to ascertain.

- Finally, some studies of fake news have used content analyses to define fake news in terms of certain words, links, textual themes, and types of visual content. This approach offers a number of advantages—for instance, it can be automated. However, it requires significant time, resources, and expertise to implement, and human oversight is required to screen for false positives.

In sum, there are a wide variety of scholarly perspectives on what precisely constitutes “fake news,” so it is particularly important for studies dealing with a particular kind of fake news to specify precisely what kinds of content they are referring to. As mentioned previously, this dissertation borrows from Marwick & Lewis (2017) and Caplan et al. (2018) to formulate a narrow definition of “fake news:” *misinformation and disinformation related to people and issues of political import that occurs in a form that can be shared on social media.*

Dissertation Summary

This dissertation proposes that when first-year writing courses’ learning outcomes include the skills of critical thinking, digital literacy, and source evaluation, those courses can produce civic literacy gains even when they lack an explicit civic education focus. This thesis supports the argument advanced by certain scholars in rhetoric and composition—notably McComiskey (2017)—that writing teachers are uniquely well suited to the task of civic education in the 21st century. Though the dissertation examines only a few civic literacy skills that pertain directly to the task of identifying and refuting fake news, it allows for the possibility that broader civic literacy gains might be possible.

The first chapter of this dissertation introduced the notion of civic education, and it situated the research project at the heart of this dissertation within broader academic conversations about the role civic education should play in higher education. It established an exigence for the project, arguing that educators in rhetoric and composition would benefit from studying topics of civic import more systematically and empirically. The chapter then provided an overview of the project itself, briefly explaining its goals, its format, and the origins of Civic

Online Reasoning. Finally, it introduced the concept of fake news and provided a rationale for the definition of the term used in the context of the research project.

Chapter 2 offers a review of literature relevant to the study at the center of this dissertation, with a focus on work in the fields of rhetoric and writing studies. It begins by examining the notion of “post-truth,” which has influenced how rhetorical scholars conceptualize fake news. Then, it summarizes work that deals explicitly with fake news. The chapter distinguishes between scholarship conducted pre-2016 and post-2016 to demonstrate how, in recent years, researchers motivated by events like Brexit and the presidency of Donald Trump have examined fake news with a new sense of purpose that offers both benefits and pitfalls for their work. After a brief discussion of how the related topic of civic education has been explored in rhetoric and composition, the chapter offers an overview of pedagogical research from outside rhetoric and writing studies that engages with fake news. This section explores the concept of Civic Online Reasoning, which is vital to the quantitative portion of the study, in detail. The chapter concludes by identifying a gap in the literature: specifically, that writing studies lacks an empirical understanding of how everyday educational interventions common to writing classrooms affect students’ civic skills, including the ability to interpret and judge fake news.

Chapter 3 details the procedures for the study. It begins by introducing the notion of “constructed response” items, which feature prominently in the study, before describing extenuating circumstances related to the 2020-21 COVID-19 pandemic that affected the trajectory of the study. The chapter then details the COR assessment instrument that was used to gather data from students in participating course sections, describing its composition, administration, and rationale, and it provides scoring rubrics for each of the component items on the instrument. Next, the chapter discusses the qualitative content analysis of course documents gathered from participating sections. This entails a summary of grounded, thematic coding practices as described by Saldaña (2016) as well as a discussion of how anonymity was maintained during this portion of the study. The chapter concludes by enumerating the quantitative and qualitative data sources that resulted from the study, explaining statistical procedures for establishing the significance of the study’s results, and describing various limitations in the study’s approach to its data.

Chapter 4 presents the results of the study. The first half of the chapter provides summary statistics, significance tests, and numerical information (e.g., interrater reliability scores) related

to the data generated during the quantitative portion of the study. It also describes the demographic qualities of student participants and includes a brief discussion of the individual students who achieved the greatest skill gains. The second half of the chapter describes the results of the qualitative text analysis. It provides the results of the initial coding effort, which used a coding scheme devised prior to the study, explains the limitations of this initial effort, and subsequently describes the results of a second coding effort that used a revised set of codes. Each section includes commentary noting important trends and describing key findings.

Chapter 5 discusses the results of the study. The chapter begins by considering students' pretest scores in isolation, discussing relevant features of the data that suggest baseline trends in performance among first-year writing students. The chapter then proceeds to involve students' posttest scores and skill gains in the discussion, demonstrating how students improved (or did not improve) their performance on particular items. Both of these sections also provide several examples of students' written responses to illustrate particular trends in how students' responses produced certain scores. The chapter concludes by considering the quantitative results alongside the results of the textual analysis, noting difficulties in interpreting the qualitative data.

Chapter 6 concludes the dissertation. It first recapitulates the dissertation's research questions and explores the degree to which the study answers those questions. Then, it describes several limitations of the central study and outlines strategies future researchers could use to overcome these limitations. The chapter also comments on the COR assessment itself, noting qualities that made it generally suitable for use in the context of first-year composition as well as signs that it may not have functioned perfectly in the new context. The dissertation concludes by addressing scholars in the field of rhetoric and composition. It calls for these scholars to embrace new empirical and quantitative approaches to their research not only as they argue for their roles as civic educators, but also as they argue for the benefits of study in their field more generally. Scholars should pursue these new modes of inquiry with a spirit of humility and bravery, confident that by doing so they will be fulfilling their roles as rhetoricians.

CHAPTER 2: LITERATURE REVIEW

This chapter summarizes scholarly literature relevant to the study described in the previous chapter and to this dissertation more broadly. This entails reviewing work from the fields of writing studies, media studies, educational science, and critical theory (though, in the latter case, only briefly). By exploring this literature, this chapter accomplishes three important tasks. First, it introduces the key topics of this dissertation and, when necessary, provides background information for these topics. Second, it places this dissertation and its central study within an ongoing scholarly conversation about how best to address fake news in the academy. Finally, it argues for the novelty, credibility, and exigence of the study at the center of this dissertation by demonstrating a dearth of empirical, quantitative research of fake news occurring in writing studies despite significant interest in the topic within the field.

The initial portion of this chapter addresses the notion of “post-truth,” which has proven influential in subsequent scholarly attempts to study and discuss fake news (particularly in writing studies). First, the chapter examines post-truth from a theoretical perspective. Then, several pieces from writing studies that engage with the notion of post-truth are discussed. After this, the chapter offers a broad examination of work in rhetoric and composition relevant to current scholarly conversations about fake news and associated topics. This section is divided into two subsections: “Pre-2016” and “Post-2016.” This is because the 2016 US presidential election spurred two important shifts for scholars in these fields. First, they began to refer to the specific notion of fake news in their scholarship, rather than related notions like misinformation or propaganda. Second, they began to focus on the rhetoric and texts associated with specific figures and events (like Donald Trump and the 2016 election). Next, the chapter provides a brief overview of civic education and civic literacy. These two concepts do not originate in writing studies, but they are nevertheless relevant to current attempts to study how writing classrooms can address fake news. After this, the chapter briefly describes pedagogical study of fake news outside writing studies. Special attention is paid to the concept of Civic Online Reasoning, which is instrumental to the study described in the next chapter. Finally, the chapter concludes by summarizing the most important insights from the preceding sections and articulating a research

gap: namely, that, despite offering some insights for how to address fake news in the classroom, the discipline of writing studies has not made many attempts to verify these insights empirically.

The “Post-Truth” Condition

Theoretical Understandings

Some scholars have conceptualized the task of teaching students about fake news as that of helping students adjust to a “post-truth” existence. While “fake news” and “post-truth” are usually not used synonymously, in recent work that deals with the post-truth, fake news is often presented as a phenomenon that exemplifies a supposedly post-truth modern era. Thus, an understanding of how scholars have conceived of the post-truth can inform attempts to understand fake news itself. However, whereas fake news can be observed in the form of discrete, tangible texts, post-truth is an abstract concept—a conceptual framework for understanding these texts, the people that create them, and the audiences that consume them. Thus, the first part of this section borrows some evidence from the realms of philosophy and critical theory (and not, e.g., solely from writing studies) to illustrate the qualities of the post-truth condition.

McComiskey (2017), exploring the role of the rhetoric and composition discipline in a world where fake news abounds, explains the connection between rhetoric and objective truth by way of reference to a handful of key philosophers and scholars. Writes McComiskey, even though rhetoric and truth are not the same thing, “all rhetorics ... have existed on an epistemological continuum that includes certain facts, even when those rhetorics do not themselves participate in those facts, realities, and truths” (p. 7). To explore this idea, McComiskey notes how Plato and Aristotle conceptualized rhetoric as something that can be understood only in comparison to an absolute sense of truth. Sophists are misleading, for instance, because their rhetoric strays from this objective truth. Subsequently, he gives examples of modern philosopher-scholars like Stephen Toulmin, Chaim Perelman, and Lucie Olbrechts-Tyteca who similarly situate rhetoric in the realm of practical reasoning, which can be defined only in comparison to the foundational truths of science and philosophy.

Popular usages of “post-truth” tend to describe a set of conditions in which rhetoric becomes unmoored from these foundational truths. Oxford Dictionary, which named the term

“post-truth” its 2016 word of the year, is defined as “Relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief” (OxfordLanguages, 2016, para. 2). Scholarly attempts to define post-truth have hewn fairly close to this definition, though several writers have chosen to emphasize other aspects of what they consider to be post-truth. Tallis (2016), for example, describes post-truth as a condition that symbolically destabilizes or even destroys traditional notions of truth (p. 8). Philosopher A.C. Grayling, by contrast, emphasizes the self-regard of post-truth rhetors, describing post-truth rhetoric as a narcissistic endeavor in which the rhetor’s personal opinion determines rationality.

As is the case with fake news, the notion of post-truth has come to be strongly associated with recent events like the 2016 US Presidential election not only within popular discourses, but within the academy as well. Scholars like McComiskey (2017), Montgomery (2017), Lakoff (2017), and others have made this connection explicit by exploring how the rhetoric of Donald Trump (as candidate and/or president) embodies aspects of the post-truth. Some recent scholars have also emphasized the populist or authoritarian qualities of post-truth rhetoric (see, e.g., Sengul, 2019; Waisbord, 2018) in efforts to explain the appeal of modern movements employing that rhetoric. Others have connected the notion of post-truth to specific modern populist figures and movements. For example, Harsin (2018) applies post-truth theories to French activist groups fighting to remove gender theory from educational curricula.

However, while writers frequently describe the idea of the post-truth in terms of these new figures, platforms, and phenomena, similar ideas predated these things by decades. One oft-cited example is the idea of “truthiness,” coined by comedian Stephen Colbert in 2005 to describe the tendency of the George W. Bush administration to base its arguments (e.g., those in favor of invading Iraq) in appeals to emotion and intuition rather than to reason. Another example explored in greater detail later in this chapter is Harry Frankfurt’s influential notion of “bullshit,” which dates to the 1980s. Thus it is not surprising that some pre-2016 scholarly work can also inform current understandings of post-truth. While pre-2016 scholars rarely invoke the precise term “post-truth,” as this term came to popularity during and after the election, several pieces about demagoguery, populism, propaganda, and misinformation can be surprisingly apropos. For example, in a discussion of Lacan’s four discourses, Slavoj Žižek (2006) relates a Lacanian anecdote about a man who becomes jealous when he suspects his wife is being

unfaithful. At the end of the anecdote, Žižek compares the jealous man's paranoia to the rhetoric of the Third Reich:

Recall, again, Lacan's outrageous statements that, even if what a jealous husband claims about his wife (that she sleeps around with other men) is all true, his jealousy is still pathological. Along the same lines, one could say that, even if most of the Nazi claims about the Jews were true (they exploit Germans, they seduce German girls), their anti-Semitism would still be (and was) pathological because it represses the true reason the Nazis needed anti-Semitism in order to sustain their ideological position (2006, para. 17).

Though the comparison might strike some readers as absurd or even offensive, it nevertheless offers an important insight regarding narratives of “post-truth” existence: that the condition of being “post-truth” should not necessarily be understood as an utter disregard for facts that leads one to fabricate reality from whole cloth. Rather, being “post-truth” more often means something like approaching the very task of truth-telling itself in bad faith. Under this paradigm, ideological conclusions and material goals precede their arguments, which leads to situations where small, local truths—facts, in other words—can be used to support larger, self-serving lies. Conversely, because a conclusion is pre-determined, factual rebuttals are powerless: the facts supporting the conclusion must be true because the conclusion must be true.

More recently, Bufacchi (2020) has identified strong connections between the work of 20th century philosophers Hannah Arendt and Jürgen Habermas and the modern concept of post-truth. Arendt's influential essay “Truth and Politics” describes truth not as an elevated, abstract ideal, but as something with real-world coercive power. This explains the frequent attempts of authoritarian and populists to subvert it with, e.g., post-truth rhetoric: “truth has a despotic character. It is therefore hated by tyrants, who rightly fear the competition of a coercive force they cannot monopolize” (Arendt, 2000/1967, p. 555-556). Similarly, Habermas' conceptualization of truth as the product of rational consensus can help explain how post-truth rhetors gain legitimacy. Rational consensus is a hypothetical communicative situation in which “all the parties involved are committed to a search for a normative consensus produced by rationally cogent reasons and the legitimacy of a better argument” (Bufacchi, 2020, p. 7). Bufacchi explains that post-truth rhetors attempt to manufacture the form (but not the essence) of rational consensus. In other words, “Post-Truth appeals to the notion of consensus in order to weaken consensus around truth” (Bufacchi, 2020, p. 8). However, while Bufacchi clearly values

both philosophers' attempts to illuminate the nature of truth, he also demonstrates how each one must be amended to explain post-truth more accurately. While Arendt's theory is preoccupied with authoritarian and illiberal regimes, Bufacchi argues that truth is a compelling, coercive force in liberal democracies too. Thus, post-truth can also flourish under liberal regimes. Similarly, Habermas fails to recognize that his consensus theory of truth allows for the antithesis of truth (which Bufacchi argues is post-truth) to be based on consensus as well. Thus, Bufacchi argues that appeals to truth ought in some cases to be replaced with appeals to truthfulness, which encompasses not only accuracy but also a moral element: sincerity. This, he argues, is something post-truth lacks, as it is cynical and self-serving by its very nature (2020, p. 12).

The fact that thoughts penned well before the 2016 election, like those of Zizek, Arendt, and Habermas, can readily be brought to bear to explain current narratives of post-truth suggests that post-truth is not a uniquely modern phenomenon (this is, not coincidentally, the explanation offered by Bufacchi). Though these scholars may have lacked the terminology to give name to the post-truth and though they could not rely on modern figures like Donald Trump for their examples, their work nevertheless helps illuminate the peculiar rhetorical arena that has come to define contemporary political discourse. The fact that the phenomenon known today as post-truth is not new should comfort writing scholars who fear that the skills of logic, research, and argumentation will lose their value in a post-truth world. In fact, these skills have coexisted with post-truth for decades.

The next section details recent work in writing studies that engages with the notion of post-truth. While some of this work attributes the post-truth condition mainly to people like Donald Trump and phenomena like the 2016 election, contra Bufacchi, the authors' practical recommendations are more important than their philosophical arguments.

Recent Attempts to Understand Post-Truth in Writing Studies

Since the 2016 election, scholars in writing studies have endeavored to understand the post-truth condition much as they have sought to address fake news in the classroom. Occasionally, they have even pursued both goals at the same time. Ellen Carrillo, author of *Teaching Readers in Post-Truth America* (2018), is typical of scholars in the discipline insofar as she frames the election as an inciting incident that embodies the qualities that have come to be known as post-truth and whose influence continues to color educational life. If the election did

not literally cause the post-truth era to emerge, it served as a symbolic starter's pistol for scholars like Carrillo. Unlike previous historical events marked by post-truth rhetoric, the 2016 election portended massive, sudden cognitive shifts in the population at large. "We have been privy to any number of previous "literacy crises," as well as political crises [and] 'fake news'," writes Carrillo (2018, p. 4). "What we have not witnessed before, though, are the cultural and ideological shifts that characterize our present moment." Bruce McComiskey, who shares Carrillo's view of the 2016 election as the inciting incident of post-truth existence, argues that scholars of composition and rhetoric are uniquely equipped to combat the influence of post-truth rhetoric: "Writing teachers, perhaps better than anyone else, can prepare the next generation of voting citizens to recognize and fight against the kind of rhetoric that characterizes the current political climate" (2017, p. 38). Disciplinary associations have similarly identified the post-truth as an issue of concern for the field. The National Council of Teachers of English (NCTE), in particular, has hosted guest blog posts on the topic (e.g., Ellenberg, 2017) and published a special issue of *English Journal* on the associated topic of fake news.

While a variety of actors agree that post-truth demands the attention of the field, the matter of how precisely to bring understandings of post-truth to bear in the classroom is another matter. Writing studies scholars propose a variety of strategies. Some posit that writing teachers should stick to what they likely already know. John Duffy, writing in *Inside Higher Ed* (2017), argues that colleges must simply bolster first-year writing programs, which traditionally teach values like "honesty, accountability, fair-mindedness and intellectual courage" (para. 5) that allow students to resist the allure of post-truth rhetoric. "The first-year writing class offers a robust defense against the post-truth culture and provides a model for constructive, fact-based public discourse," (2017, para. 5), writes Duffy. Others have identified new strategies for teaching fundamental skills like argumentation. Gagnon (2019) recommends using a "multi-phasic" (p. 2) approach he terms "rhetorical segmentation," which encompasses the skills of assessing a text's rhetorical velocity per Ridolfo and DeVoss (2009), interpreting its ideological modality, and identifying its capacity to inflict public harms. Sundvall and Fredlund (2017) find great promise in activist pedagogies that have students create public-facing writing aimed at effecting social change. This kind of writing pedagogy, the authors argue, is productive precisely because it forces students to engage with the uncertainties and frustrations of the real world: "[activist pedagogies] force teachers and students to live with contradictions, complications, and

complexities ... there is no better way to produce effective citizens than to practice citizenship within authentic rhetorical situations” (Sundvall & Fredlund, 2017, sec. 10). The authors note, however, that instructors must approach activist work with caution. Activist writing poses a variety of risks for teacher and student alike, including the potential for difficult classroom conversations and even public backlash. Carrillo (2018), for her part, suggests that writing instructors and their institutions should begin to emphasize critical reading as well as writing. “Within the field of rhetoric and composition, reading still remains under-theorized, making it that much more important to [determine] how it fits into the field’s larger response and resistance to this post-truth culture” (Carrillo, 2018, p. 8).

While the study in this dissertation does not engage with notions of post-truth directly, it is nevertheless informed by current understandings of post-truth. Writing studies scholars devising pedagogies to combat specific problems like fake news often articulate their work as a response to post-truth rhetoric, post-truth existence, or some similar concept (see, e.g., McComiskey 2017, Carrillo, 2018, Gagnon, 2019, and others). They also often cite research by scholars who are primarily concerned with post-truth (McComiskey’s *Post-Truth Rhetoric and Composition*, for instance, makes frequent appearances). However, despite these tendencies, the diversity of opinion in scholars’ recommendations for post-truth pedagogy cannot be denied. Duffy (2019), for instance, recommends a relatively traditionalist approach, while Sundvall & Fredlund (2017) suggest that educators respond with a more radical activist pedagogy.

In short, the field of writing studies has not settled on a single set of practices for addressing the post-truth state of being that ostensibly defines modern life in the classroom. Nor has much been done to measure the effects of post-truth living (or the post-truth pedagogies that have been suggested as remedies) empirically. It is valuable to keep these things in mind when designing pedagogies to bolster students’ ability to identify and interpret fake news, which has been posited as a category of text exemplifying post-truth qualities (e.g., McComiskey, 2017). The fact that writing and rhetoric scholars have not yet arrived at a consensus about teaching and learning in a post-truth era evinces the fact that a variety of pedagogical approaches remain to be proposed, tested, and verified.

Fake News in Rhetoric and Writing

Popular discourses about fake news that arose as a result of the 2016 election coincided with a significant increase in scholarly interest in fake news. This shift was both rapid (by the admittedly glacial standards of academic publication) and pronounced. Google Scholar searches for the term “fake news” average approximately 21,133 hits per year for the period 2014–2016; for the period 2017–2019, the figure is roughly 32,500 (an increase of over 50%). The field of writing studies was no exception to this trend—a search of CompPile, a database of composition and rhetoric scholarship, revealed no hits for the term “fake news” published prior to 2017.

Today, fake news is at the center of an ongoing conversation among writing studies scholars seeking new ways to understand the phenomenon and address it in the classroom. However, this does not mean that members of the discipline suddenly became aware of fake news early in the morning hours of November 9th, 2016, and began rushing to understand it. Far from it. Because composition studies research encompasses attempts to understand the ways that writing systems, writing technologies, conventions, genres, and rhetorical paradigms impact the communication process (among other concerns), much work prior to the 2016 election can help explicate fake news as a communicative phenomenon. This is true even though relatively few composition scholars dealt explicitly with the topic before the 2016 election made fake news a household phrase.

Thus, this section is divided into two halves. The first summarizes important developments in writing studies prior to 2016 that pertain to modern conversations about fake news within the discipline even though these developments do not engage with fake news explicitly. The second summarizes the scholarly conversations that began with the 2016 election and continue to this day.

Pre-2016

Prior to the 2016 election, few (if any) scholars in writing studies referred to the phenomenon of fake news using that precise phrase. More commonly, scholars opted to engage with concepts like misinformation and propaganda (see, e.g., Barnes, 2009; Dunn, 2012; Giunchi, 2002; Henderson & Braun, 2016; Sasaki, 2008) or to examine the systems that disseminate these forms of information, like social media (see, e.g., Dadurka & Pigg, 2011;

Guglielmo, 2013; Pigg, 2014; Swartz, 2010). Writing scholars have also historically concerned themselves with the ways that technology have affected the products and processes of writing. Though none of these efforts invoke a modern understanding of fake news, they nevertheless provide an essential foundation for understanding the state of the discipline today. It is impossible, for instance, to broach current conversations about the role of automated communication systems in the spread of fake news online (see Laquintana & Vee, 2017) without understanding that these conversations largely take for granted all writing that occurs in digital spaces cannot be decontextualized from the technological systems that facilitate it. Likewise, a discussion of how to teach students digital information literacy in writing classrooms (see Craig, 2017) will not be complete without addressing how writing scholars have arrived at their current understanding of what constitutes “literacy.” More generally, reviewing past writing studies research helps demonstrate why scholars of writing studies working today pose the questions that they do with regards to fake news.

One particularly important innovation in writing studies prior to the burst of interest in fake news ushered in by the 2016 election was the development of the rhetorical concept of “bullshit.” This is a convenient starting point because “bullshit,” despite being a somewhat old concept, figures heavily in modern discussions of the post-truth in writing studies (see, e.g., McComiskey, 2017). In a 1986 paper (later republished in book form), philosopher Harry Frankfurt defines his notion of bullshit. He distinguishes it from colloquial understandings of the term that can encompass a handful of related ideas including half-truths, statements that amount to meaningless bluster, and outright lies. Frankfurt conceives as bullshit essentially as rhetoric delivered without regard for the truth (2005, p. 30–31). In this sense, bullshit stands in contrast not only to truth-telling, but also to lying. Rhetors who lie, Frankfurt maintains, must internally acknowledge the truth in order to conceal or obscure it in their external words and actions. By contrast, rhetors who spread bullshit do not aim to engage with the truth at all. The only imperative guiding their rhetoric is their own self-interest.

Someone who lies and someone who tells the truth are playing on opposite sides, so to speak, in the same game. Each responds to the facts as he understands them, although the response of the one is guided by the authority of the truth, while the response of the other defies that authority and refuses to meet its demands. The bullshitter ignores these

demands altogether. He does not reject the authority of truth, as the liar does, and oppose himself to it. He pays no attention to it at all. (Frankfurt, 2005, p. 60–61)

In Frankfurt's view, bullshitting is more harmful than outright lying (2005, p. 60). He argues that repeatedly resorting to bullshitting degrades a rhetor's sense of what is true and what is false: "Through excessive indulgence in [bullshitting], which involves making assertions without paying attention to anything except what it suits one to say, a person's normal habit of attending to the ways things are may become attenuated or lost" (Frankfurt, 2005 p. 60). Habitual liars do not suffer a similar risk because, in order to lie, they must, as a matter of course, concern themselves with the truth.

Though Frankfurt is not a composition scholar, his notion of bullshit has nevertheless proven influential in writing studies. A number of scholars in the field have adopted Frankfurt's ideas to clarify topics of interest—or even aspects of their own work. Eubanks and Schaeffer (2008), for instance, explore Frankfurt's concept of bullshit to investigate claims that academic research writing constitutes bullshit. Similarly, James Fredal's 2011 *College English* article "Rhetoric and Bullshit" recapitulates Frankfurt's ideas for rhetoric and composition scholars, demonstrating how these ideas inform work in writing studies by casting bullshit as *antistrophe* to rhetoric. In 2015, *Rhetoric Society Quarterly (RSQ)* published a six-essay forum focused entirely on Frankfurt's notion of bullshit. The pieces in the forum, which borrow Frankfurt's ideas to investigate topics as diverse as conspiracy theories (Roberts-Miller, 2015) and the snobbish rhetoric of wine-tasting (Young, 2015), demonstrate the broad applications of Frankfurt's theory within the realm of rhetoric.

Roberts-Miller's *RSQ* piece is particularly apropos to current scholarly discussions of fake news. In "Conspiracy Bullshit," Roberts-Miller describes the incongruity between conspiracy theorists' belief in demonstrably untrue phenomena and their propensity to nonetheless appeal to scientific or factual authority. According to Roberts-Miller, the evidence conspiracy theorists cite is "often incomprehensible, internally contradictory, and sometimes fabricated; the journals in which it is published are not as scientific as their names sound, and rely heavily on cunning projection" (2015, p. 466). Nevertheless, conspiracy theorists attempt to give the impression that their theories are supported by evidence and expert opinions. Roberts-Miller argues that this strategy is effective for conspiracy theorists' audiences not because this use of evidence is truly persuasive, but because it signals membership in an ingroup. Citing

certain sympathetic individuals and sources—even when they are inaccurate, biased, or disreputable—allows conspiracy theorists to perform their group affiliation. Subsequently, conspiracy theorists’ audiences express their group affiliation by expressing belief in the evidence, even if it can be easily debunked or if they do not understand it. “Belief in the data is the appropriate performative response, because recognizing that the data is true (and truly related to the true claims) signifies that one is also a member of the ingroup” (Roberts-Miller, 2015, p. 466).

If there is a common thread running through writing studies research that invokes Frankfurt’s notion of bullshit (e.g., Eubanks & Schaffer, 2008; Fredal, 2011; Roberts-Miller, 2015) it is that bullshit helps explain how the most transparently cynical, dishonest, and dangerous forms of rhetoric remain effective. Though writing studies research of bullshit has tapered off as the phenomena of fake news and post-truth have come into greater focus, Frankfurt’s concepts retain influence. This is no doubt in part because they lend themselves to easy comparisons with fake news. For instance, McComiskey (2017), writing in the immediate wake of the 2016 election, draws frequent connections between Frankfurt’s bullshit and the modern concepts of post-truth and fake news (see, e.g., p. 9–13).

While bullshit can help inform rhetorical understandings of fake news, not all rhetoric and composition research relevant to modern discussions of fake news traces back to Frankfurt’s notion of bullshit. For example, a consistent trend in some writing studies scholarship—some of it predating modern discussions of fake news by a matter of decades—is the ongoing attempt to understand the sorts of digital systems that are now frequently associated with fake news. As Laquintano and Vee (2017) note, writing scholars have long concerned themselves with the ways that technological systems mediate the process and products of writing. Leblanc (1993), for instance, investigates how writing technologies reconfigure composition instruction, while Baron (1999) compares then-recent computer innovations to the writing technologies from eras past to construct a cyclical theory of how writing technologies develop. Bolter, in his early-1990s output (e.g., 1991’s *Writing Space* or his contributions to edited collections like *Literacy Online: The Promise (and Peril) of Reading and Writing with Computers*), even makes prescient predictions about the future of computer-based writing and publication based on analyses of the development of hypertext (Bolter, 1991, 1992). Tuman (1992), similarly, discusses the ramifications of computer-assisted writing technology for literacy.

More recently, composition scholars have begun to focus on the effects of online networks, automation, algorithmic content generation, and artificial intelligence on various aspects of writing. As Jim Ridolfo and William Hart-Davidson note in the introduction to *Rhetoric and the Digital Humanities*, this has coincided with a general increase in interest in the digital humanities within writing studies (2015, p. 3). Moreover, while these scholars do not usually list fake news or online misinformation as a point of exigency, their work nevertheless illuminates how writing studies has come to view the process and products of digital composition.

Nicotra (2009), for example, argues that traditional definitions of writing should be expanded to accommodate the ways that digital media have impacted composition. She theorizes that the internet allows for networked composition practices in which many individuals share authorship for a text, which enables “possibilities for configurations and systems to emerge as a result of activity of the so-called hive mind that could not have been anticipated or conceived of by an individual author working alone” (p. W260). Omizo and Hart-Davidson (2016) investigate strategies for training automatic systems to recognize the rhetorical patterns in academic citation practices. Krista Kennedy (who writes at greater length about the interaction between technology and authorship in her 2016 book *Textual Curation: Authorship, Agency, and Technology in Wikipedia and Chambers's Cyclopædia*), argues that acts like assigning metadata to texts in large information structures constitutes an act of composition itself (2016). Thus, the people (or, by implication, systems) that manage these structures perform authorship and composition through routine acts of curation and arrangement. The conclusions these scholars (and others) reach are echoed by influential voices in professional and technical writing who have identified how information structures influence the texts that populate them (e.g., Spinuzzi, 2003, 2007).

Reading this work with the benefit of hindsight, it is difficult not to arrive at the conclusion that fake news texts distributed via social media should be viewed distinctly from traditional texts like books insofar as they are often products of distributed authorship. Some pre-2016 research into automated online writing systems like social media bot networks appears to confirm this supposition.¹ Guilbeault (2016), writing prior to the 2016 election, develops an

¹ In general, the term “bot” refers to a wide variety of software programs that automatically gather information from the internet (Woolley, 2016). The term is also used to refer to a specific kind of program that imitates the behavior of a real user on social media. In doing so, social media bots can gather information, promulgate messages, and influence other users. Though it is difficult to determine precisely how influential coordinated networks of social

ecological model for the rhetorical agency of social media bots. Guilbeault argues that social media platforms are unique forums for rhetorical interactions because they exist simultaneously as habitats for communication and as tools for constructing one's sense of self. This, says Guilbeault, means that bots on social media can satisfy traditional definitions of rhetorical agency. For instance, social media bots satisfy Aristotle's ethos-centered definition of agency. For Aristotle, writes Guilbeault, "ethos arises not only from rhetorical self-expression, but also from the habits [developed] in material and social habitats. Social media platforms ... are environments where the available modes of dwelling consist of prescribed ways of constructing the self" (2016, p. 5011). Thus, Guilbeault calls for fellow researchers to begin studying bots on social media not as unthinking pieces of technology, but instead as rhetorical equals. Paradoxically, this can lead researchers to profound conclusions about how human beings exist as rhetorical actors today. "Social bots may have particularly serious consequences for human identity because they do much more than provide convenient metaphors. They actually construct an identity that reflects and shapes how humans dwell in the platform society" (2016, p. 5013).

Digital Literacy

As scholars of rhetoric and writing have come to understand the technologies and systems that increasingly dictate composition in the modern age, they have sought ways to enact these understandings in writing classrooms. This has led them to adopt concepts like digital literacy, which allow them to define and measure students' ability to compose with computers, in their research. This subsection briefly discusses a few relevant pieces of digital literacy published before the 2016 election that pertain to modern conversations about fake news within the discipline.

In popular usage, the term "digital literacy" typically refers to an individual's competency in using computers and digital media to accomplish everyday tasks. This typically includes some tasks that incorporate writing (like using a word processor to compose and format written information), though it can also include non-writing composition tasks (like manipulating image and audio content). In the academy, however, "digital literacy" encompasses a variety of specific scholarly sub-fields and niches. Handa (2001) notes that digital literacy is by, its nature,

media bots are in terms of their ability to sway public opinion, some research has suggested their effect can be considerable (see, e.g., Boshmaf et al., 2011; Hwang, et al., 2012).

an interdisciplinary field of study, with its scholars frequently drawing upon research in a range of humanities and social science disciplines including “visual communication; technical communication; rhetorical theory; design theory and practice; art; psychology; hypertext theory; sociology; film studies; semiotics; and architecture” (p. 195). For a more detailed exploration of digital literacy, along with comparisons to the related concepts of media literacy and information literacy, see Koltay (2011).

If the contributions of writing studies scholars in digital literacy can be summarized in a single sentence, it is as follows: innovations in digital technology herald exciting new opportunities for writing students, but teachers much temper their optimism toward these technologies by maintaining a careful regard for the practical realities that can complicate their use in the classroom. Writing scholarship tends to follow a fairly predictable cycle when some new digital technology emerges that can be used for writing. The spread of new technology initially attracts passionate scholarly interest as scholars attempt to apply it to a variety of writing classroom tasks. Subsequent work then identifies the limitations of these earlier attempts, amending them to be more versatile, practical, or sensitive to student needs. Often, this involves examining how issues of identity (like race, class, educational history, etc.), culture, and technological history complicate simplistic narratives about how technology functions in the classroom. It can also involve sifting through many contradictory studies centered on a single topic to identify robust conclusions that can be applied across writing classrooms in general.

Even when most the most cutting-edge computers available could perform only a small fraction of the tasks that the cheapest modern computers now can, writing scholars participated in this cycle. In the preface to *Critical Perspectives on Computers and Composition Instruction*, a 1989 collection of pedagogical essays, editors Hawisher and Selfe describe earlier research as if they are dispelling accumulated naivetes regarding computers and writing. Hawisher and Selfe write that “As professionals, we [writing teachers] have come to realize that technology cannot simply be incorporated into curricula without discrimination, without careful thought as to how the integration of technology will affect students and pedagogical approaches” (p. ix). Later, while introducing a series of essays detailing contemporary problems in the research of computers and composition, the editors lament that, despite the rapid adoption of computers in writing instruction, “we have had insufficient time as a profession for sharing problems ...,”

exchanging pedagogical experiences ..., and considering the political impact computers have on English programs” (p.71).

Interest in the influence of technology on writing instruction resurfaced when the next generation of writing scholars attempted to introduce the internet to the writing classroom. Many studies published around the turn of the millennium, for instance, explore the myriad possibilities of using student-, instructor-, class-, or department-authored websites in composition classes (see, e.g., Barrios, 2004; Winner & Shields, 2002). Others offered activities and assignments that had students analyze online texts (Kent-Drury, 1998) or posited the affordances of online media for spurring students to interrogate their own cultural and ideological identities (LeCourt, 1998). While even these early attempts to incorporate digital media into writing classrooms demonstrate an awareness of how issues like culture, identity, technological access, and educational context can impact students’ experiences online, subsequent scholarship has expanded on these themes (see, e.g., Chambers, 2016; Herrington & Stanley, 2012; Poe, 2013).

Understanding the pre-2016 status quo of digital literacy research within writing studies is necessary for researchers attempting to devise anti-fake news pedagogies because some of the more promising pedagogical interventions and assessments being studied today are based on work in digital literacy and related subjects. For example, the construct of Civic Online Reasoning, which is explored in detail at the end of this chapter, has been described as an online-specific subset of skills that reside within the broader concept of media literacy (Wineburg & McGrew, 2019). This would suggest at least some overlap with the concept of digital literacy. It would also suggest that writing scholars could contribute to the conversations about these interventions and assessments much in the same way as they have contributed to conversations about digital literacy. They could, for instance, explore how concepts like Civic Online Reasoning could be employed in writing instruction. They could also demonstrate how the practical considerations of educational context and student identity complicate current understandings of Civic Online Reasoning as part of broader efforts to make generalizable assessments and interventions.

Post-2016

After the 2016 election, writing studies scholars began to engage with the topic of fake news with a newfound sense of urgency—and began explicitly referring to it as “fake news,”

adopting the phrase that had become popular as a result of the election. This burst of scholarly energy has also led to some acknowledgment that fake news must be conceptualized as a persistent historical phenomenon rather than as a recent innovation. Despite this, many post-2016 studies explicitly mention the 2016 election as an exigency for the research, suggesting or outright stating that the election represented a special occurrence insofar as it led to the creation of new, pernicious forms of fake news (see, e.g., Allen, 2018; Carillo, 2018; McComiskey, 2017). Miller and Leon (2017) exemplify this line of thinking in their assertion that “Fake news is not new ... What is new about fake news is how quickly it goes viral.”

In broad strokes, writing studies research of fake news carried out during and after the 2016 election has focused on explaining fake news as a category of rhetoric or text, analyzing fake news as a feature of important cultural discourses, and investigating how best to address it in the classroom. These include:

- Attempts to describe the rhetorical qualities of:
 - arguments advanced in fake news (e.g., Minnix, 2017)
 - discourses within communities that consume fake news (e.g., Forte, 2020)
 - the current historical moment, often using a “post-truth era” framing (e.g., McComiskey, 2017)
- Attempts to develop pedagogies and assignments:
 - that address the problems posed by fake news or post-truth (e.g., Anson & Andrews, 2020; Carrillo, 2018; Laflen, 2020; McComiskey, 2017;)
 - that engage with technologies associated with fake news (e.g., Ehrenfeld & Barton, 2019; Lawrence, 2020; Vie, 2018)
- Attempts to describe various literacies for digital media and the networks of information that disseminate it (e.g., Craig, 2017; Laquintano & Vee, 2017; Sills & Kenzie, 2020)
- Broader arguments about how disciplines like rhetoric and composition should address fake news, including:
 - the notion that scholars of rhetoric and literacies should make greater efforts to engage with other disciplines’ research (e.g., Wetherbee, 2017)
 - the notion that teachers should focus on traditional concerns of the discipline like argumentation (e.g., Duffy, 2017) or should use promising new strategies to teach these traditional skills (e.g., Gagnon, 2019)

- the notion that non-traditional approaches to scholarship and pedagogy, including those that emphasize activism (Sundvall & Fredlund, 2017), or novel rhetorical perspectives (Riche, 2017) will help fight fake news.

This section discusses some of these studies and their findings to illustrate the “state of the discipline” with regards to fake news and associated topics.

Bruce McComiskey’s *Post-Truth Rhetoric and Composition* (2017) provides a convenient starting place for this discussion. In grappling with the rhetorical ramifications of the 2016 election, McComiskey’s piece manages to touch on—at least briefly—many of the questions and controversies that would soon come to define conversations about fake news in writing studies. It also makes implicit arguments that many subsequent pieces also make (though, of course, it is impossible to determine the precise influence of McComiskey’s writing in cases when it has not been explicitly cited). These include the arguments that the 2016 election spurred a sea change in American rhetorical culture and that the explicit arguments that fake news exemplifies the post-truth condition. These qualities of the piece make it a valuable introduction to a number of narratives that now pervade in writing studies, and a brief summary of *Post-Truth* will reveal a number of threads to other important writing studies works that engage with fake news.

The most obvious way that McComiskey presages ensuing work is its treatment of the 2016 election. *Post-Truth*, which was published in the election’s immediate aftermath, casts the election as a historical ground zero for a new paradigm that has characterized rhetorical life ever since. The piece begins with the bold assertion that the 2016 campaign constituted a “watershed rhetorical moment” (2017, p. 3). McComiskey argues not only that, due to the election, “there has been a shift in the way that powerful people use unethical rhetoric to accomplish their goals,” but also that “there has been a shift in the way that public audiences consume unethical rhetoric” (2017, p. 3). According to McComiskey, this shift can be understood as a shift toward “post-truth” rhetoric. “*Post-truth* signifies a state in which language lacks any reference to facts, truths, and realities [and] becomes a purely strategic medium” (McComiskey, 2017, p. 6). McComiskey writes that, in a post-truth world, “people (especially politicians) say whatever might work in a given situation ... If a statement works, results in the desired effect, it is good; if it fails, it is bad” (2017, p. 6).

The post-truth era, however, is not historically unique in terms of the nature (or even the number) of lies occurring in public discourses. McComiskey acknowledges that misinformation, deceptive arguments, and lies have been historical constants. Citing the Platonic dialogues, McComiskey notes that scholars have long sought to expose what they considered to be the unethical rhetoricians of their era (2017, p. 7). What distinguishes the period following 2016 from previous historical periods is an apparent lack of consensus on what constitutes objective truth in the first place. When universal notions of truth vanish from a society's collective epistemology, lies—which McComiskey argues must be defined in relation to a notion of truth—also vanish. Thus, “language becomes purely strategic, without reference to anything other than itself” (McComiskey, 2017, p. 8). Thus, one's ideological goals—and not facts—underpin arguments in the post-truth era, which emboldens cynical rhetors. In this sense, post-truth rhetoric bears a strong resemblance to Frankfurt's notion of bullshit, which McComiskey acknowledges (p. 9–13). However, McComiskey argues that “bullshit has changed post-truth” (p. 11). He posits that Trump and his political supporters exhibit “an audacious rejection of truth as a standard by which we must all be judged” (Smith, 2016, as cited in McComiskey, 2017, p. 12). Moreover, as a result of the 2016 election, bullshit has come to encompass “a complex array of rhetorical strategies, including ... fake news” (p. 13).

In McComiskey's view, two connected forces exemplify post-truth rhetoric: the phenomenon of fake news spreading via social media and the political speeches of Donald Trump. McComiskey acknowledges that fake news predates the modern era (2017, p. 13), but contends that “post-truth ‘fake news’ is something different (p. 14). McComiskey attributes this difference mainly to social media, in which “the lines between true and false, real and fake, rumor and threat are hopelessly blurred” (p. 15). McComiskey relates an instance in which a viral Instagram post suggested that violent terrorists dressed as clowns were menacing communities in Georgia. Though the Instagram post was likely a hoax, it inspired imitators to actually dress up as clowns and loiter near schools in the neighboring state of Alabama, causing a short-lived panic (2017, p. 14-15). The initial false claims about killer clowns nevertheless became self-fulfilling once they entered social media discourses that reward the purveyors of salacious stories with attention and advertising revenue (even when those stories are highly implausible). McComiskey argues that, more broadly, social media algorithms tend to provide news readers that is likely to confirm their pre-existing ideological biases because readers engage

with this content to a greater extent than they do with challenging content (2017, p. 19). For these reasons, McComiskey contends that modern manifestations of fake news are especially dangerous in terms of their ability to produce real-world consequences.

Similarly, McComiskey argues that Donald Trump typically makes no effort to connect his political rhetoric to traditional notions of truth, logic, or reason. Rather, Trump builds effective political arguments via cynical deployments of pathos and ethos. McComiskey details how Trump uses rhetorical strategies that are maligned by traditional rhetorical authorities, like name-calling and hyperbole, to provoke passionate emotional reactions from his supporters (2017, p. 33). He also uses mundane rhetorical devices like metaphors in outrageous or misleading ways to amuse his audience and persuade it to adopt a particular line of reasoning. For example, McComiskey describes an instance of Trump comparing China's leaders to the New England Patriots and the United States' leaders to a high school football team in order to sell his position on foreign trade without providing specific details (2017, p. 32). Simultaneously, Trump's speech tends to elevate his own authority while diminishing the authority of others. "When Trump is challenged ... his rebuttals do not attempt to establish or reinforce the truth-value of his claims." (McComiskey, 2017, p. 25). Instead, says McComiskey, Trump tends to respond to challenges by attacking the credibility of the entity challenging him, even when that entity is a knowledge-producing institution (e.g., the news media, the Centers for Disease Control, or academic historians (2017, p. 26)). Like fake news itself, Trump's political speech elevates ethos and pathos at the expense of logos. Trump talks as if the force of his own personality and his claims about his opponents' untrustworthiness—i.e., his ethos—ought to justify any claims he makes.

McComiskey concludes by calling writing teachers to action. He admits that he lacks a comprehensive set of pedagogical prescriptions but stresses the urgency of the discipline's response. "The effects of post-truth rhetoric may devastate composition studies if left unchecked," writes McComiskey (2017, p. 43). He posits that composition teachers should "double down" on the traditional skills and values of the discipline (p. 38), especially those articulated in the *Framework for Success in Postsecondary Writing* (Council of Writing Program Administrators et al., 2011) and the *WPA Outcomes Statement for First-Year Composition* (Council of Writing Program Administrators, 2014). The *Framework* describes eight "habits of mind" that "support students' success in a variety of fields and disciplines:" curiosity, openness,

engagement, creativity, persistence, responsibility, flexibility, and metacognition (Council of Writing Program Administrators et al., 2011, pp. 4-5). In addition, the *Framework* argues that college writing instruction should aim to develop four key skills: rhetorical knowledge, critical thinking, writing processes, and knowledge of conventions (pp. 6-9). The *WPA Outcomes Statement*, which articulates “types of results, and not ‘standards,’ or precise levels of achievement,” (Council of Writing Program Administrators, 2014, p. 1) in order to “represent and regularize” writing instruction nationwide, prescribes the same four key skills as the *Framework*.

McComiskey’s analysis is especially useful for beginning a conversation about current fake news research in writing studies because the ideas that McComiskey advances in *Post-Truth Rhetoric and Composition* are frequently reiterated, reinterpreted, or refuted in subsequent research. Sometimes, this occurs via explicit reference to McComiskey’s work. For instance, Miller and Leon begin their introduction to the December 2017 special issue of *Literacy in Composition Studies* with an extended quote from *Post-Truth*, then assert that the special issue itself aims to follow the “lines of analysis” McComiskey puts forth in *Post-Truth* (p. 10). On other occasions, however, the connection is tacit—perhaps even unintentional. For instance, though Laquintano and Vee (2017) do not cite McComiskey, they nevertheless arrive at similar conclusions regarding social media platforms and their users. Laquintano and Vee (2017) examine the roles that nonhuman writing systems like social media bot networks play in the production and spread of fake news. The authors argue that the phenomenon of fake news circulating on social media represents a broader shift wherein automated, computational writing systems increasingly performing tasks that traditionally handled by humans. As a result of this shift, the texts human beings use and produce during their day-to-day existence will increasingly be influenced by these systems (p. 43). This, in turn, affects humans’ own composition practices as they change their behavior in response. “Human writers must interact with a legion of programmed writers, sometimes controlled by shadowy actors manipulating the circulation patterns of text in the online writing ecology,” (p. 58) write Laquintano and Vee. They conclude ultimately that social media platforms are unique rhetorical arenas insofar as they force human writers to compose alongside automated systems like bot networks in unprecedented ways. The authors argue not only that writing educators have some responsibility to make students aware of these social media features (pp. 58-9), but also that they can do this via “mundane” classroom

interventions like having students publish writing assignments in a blog (though they admit the matter may be somewhat more complicated than this suggestion alone would suggest) (p. 59). Here, it is difficult to ignore overlap with two of McComiskey's main arguments: that the modern era poses unique rhetorical challenges for students, and that writing instructors can help remedy this through their everyday work.

Other recent examinations of digital spaces by writing and rhetoric scholars have offered similar conclusions. Some have opted to focus on specific online communities where fake news originates and/or circulates in pursuit of new pedagogies. In a study of threads on the infamous 4chan message board, Sparby (2017) finds that instances of bigotry and aggression can function as memetic expressions of group identity; as a result, she recommends first-year composition courses begin including social media analysis in their curricula. Sano-Franchini (2018) finds that the design of Facebook encourages users to form "mediated intimacies" (p. 401) that affect how they interpret political content and calls for technical communications scholars to examine how user experience design can emphasize "truth and integrity over expediency" (p. 403). Other studies with a pedagogical focus include the chapters in the collection *Teaching Critical Reading and Writing in the Era of Fake News* (2020), including contributions by Laflen, Anson and Andrews, Lawrence, and Sills and Kenzie. While these studies all differ in their focus, aims, methodologies, and perspectives, they are united in that they share the basic outlook expressed in McComiskey (2017). This is, again, that they see cause for concern in modern developments in political rhetoric, and they see the writing classroom as a site for intervention. Here, however, it is important to note that writing and rhetoric scholars have not only studied digital platforms in search of practical insights for use in the classroom. Others have sought theoretical insights. Nelson (2019), e.g., articulates a novel theory of rhetorical contagion via a case study of a mass hysteria event. In this instance, dozens of teens in upstate New York, spurred by sensationalistic media and social media coverage, developed psychosomatic illnesses.

Not all scholars of rhetoric and writing appear to have changed their course following the events of 2016. Compared to scholars like McComiskey, writing scholars whose work concerns digital literacy have largely not opted to pursue a new *raison d'être*. This is the case despite these scholars focusing (as a matter of course) on precisely the technologies and platforms most associated with fake news today. Beck (2017), for example, calls for composition teachers to adopt an explicit civic focus that includes instruction in "Web 2.0 literacies" (p. 50), but

recommends they do this in response to a market-driven ideology of prosumerism, whose origins she traces to the 1980s (p. 38). Williams (2017), by contrast, explores how emotion affects the process of composing with digital technology. Other writing and rhetoric scholars have investigated the ways that students use modern technologies in the composition classroom. Voss (2018), e.g., examines how inequities tied to class, race, gender, and other identity markers manifest in digital composition projects. Rivard (2019) argues that students can learn digital literacy through writing projects that take advantage of digital archives. None of these scholars engages with concepts like fake news or characterizes 2016 as the beginning of a rhetorical sea change. Elsewhere in the academy, however, researchers have explored the connections between digital literacy and fake news (albeit usually without a rhetorical perspective). These include scholars in the fields of information science (e.g., Connaway et al., 2017) and educational research (e.g., Breakstone et al., 2018). Some relevant research from these fields is discussed in greater detail later in this chapter.

In sum, since the 2016 election, scholars of rhetoric and writing have responded to what many of them perceive as a brand-new rhetorical landscape with a clear sense of purpose. They have identified specific figures, events, and texts associated with fake news and sought to explain how fake news functions in modern rhetorical arenas. They have examined the technologies, systems, and platforms associated with fake news to determine how these things shape the form and essence of fake news texts. They have sought ways to address fake news and post-truth rhetoric in the classroom. Above all, they have identified fake news, post-truth, social media, digital literacy, and associated topics as phenomena for which the fields of rhetoric and writing can offer unique insights.

It would be unwise to paint post-2016 work with a broad brush, and it would be doubly so to make unwarranted assumptions about scholars' aims for pursuing their work. That said, it is difficult to ignore certain trends that tend to be expressed across post-2016 work in general. While it is easy to find work conducted prior to the election that explored topics like misinformation, propaganda, and social media, this work tended to examine these topics out of a broad desire to understand new, unknown phenomena. By contrast, much work conducted after the election appears to study these topics at least partly out of a sense of civic or political obligation in the wake of events like the election of Donald Trump and the Brexit referendum in the United Kingdom. Sometimes, as in the case of Duffy (2017), McComiskey (2017), Miller

and Leon (2017), Allen (2018), and Carillo (2018), this motive is made explicit. Elsewhere, it is implied (e.g., Craig, 2017; Laquintano & Vee, 2017). Of course, these contributions (and the others mentioned in this section) are vital and valuable, and it is legitimate for scholars to justify their work in political terms. It is also true that not all the work mentioned in this section can be connected to events and figures of 2016—as noted, for instance, the writing and rhetoric pieces focusing on digital literacy above do not mention these things even by implication. Nevertheless, it remains to be seen whether this recent shift that has led some scholars in the field to focus on a smaller pool of figures, events, and examples than they did prior to the election will negatively impact disciplinary understandings of phenomena like fake news in the long term.

Civic Education in Composition

Rhetoric and composition scholars have involved the concept of civic education in their work virtually since the birth of their field. Early compositionists frequently used Deweyan theory to illuminate the sociopolitical aspects of writing instruction, to justify a particular pedagogy's civic importance, or as a lens for analyzing texts (see, e.g., Campbell, 1983; Kroll, 1979; Lawson, 1979; Myers, 1986; Shafer, 1981). In the ensuing decades, scholars examined the links between language education and civic education and began to describe the writing classroom as a site for civic development (see, e.g., Eberly, 2000; Ede, 1991; Ervin, 1997; Giroux, 2000; Weisser, 2002). Over time, the idea of the “citizen writer” became an important concept in the field. The influential 2009 NCTE report “Writing in the 21st Century” (Yancey), for instance, uses it to justify arguments for new approaches to teaching composition. As Wan notes, the notion of the citizen writer supposes that “writing instruction plays a key role in the preparation of good citizens, situating the classroom as a space that can reinvigorate democratic and participatory citizenship” (2011, p. 28). Today, writing and rhetoric scholars routinely describe the work of teaching composition in civic terms and apply this understanding to the most important topics of the era. Examples from the past decade include, for instance, applying concepts of literacy to online citizen journalism (Leake, 2012), reexamining historical phenomena like progressive era women's pageants to explain how they acted as forces for civic education (White, 2015), and exploring the ramifications of far-right conspiracy theories on composition pedagogy (Minnix, 2017).

In short, it is uncontroversial for scholars of rhetoric and writing to view composition as a tool for effecting real-world political outcomes, and to view the writing classroom as a space for teaching students how to do this. This dissertation similarly assumes that:

1. Composition courses can produce some meaningful change(s) in the way that students behave as civic actors, including specifically with regards to fake news.
2. This change can be measured reliably.
3. This change can be beneficial and/or edifying for students.

For these reasons, the dissertation takes the position that composition teachers can consider the civic development of their students a legitimate, worthwhile goal. It makes no claim as to whether all composition teachers *must* do this. Nor does it argue that there is only one legitimate way to accomplish civic education.

However, it is important to note that, despite widespread acceptance of the “citizen writer” concept, the stances this dissertation holds with regards to civic education are not held universally. Some prominent voices have even questioned the notion that civic education (or certain aspects of it) falls under the purview of higher education in the first place. Stanley Fish, writing in the *Chronicle of Higher Education*, argues against civic education as it currently exists in American colleges and universities on the grounds that it is inherently partisan and thus contrary to the traditional truth-seeking aims of the academy (2017). Citing a report from the National Association of Scholars (an education advocacy group that, in Fish’s estimation, “leans conservative” (2017, para. 1)), Fish argues that current approaches to civic education tend to foreground local engagement and transformative social activism. As a result, these programs assume that American society contains major flaws that must be remedied in accordance with the tenets of social justice. In effect, this means that they tend to have left-wing or progressive aims. However, whereas the Association recommends a return to traditional forms of civic education that include the “promotion of virtuous citizenship,” Fish argues that this would essentially represent an overcorrection (i.e., civic education with conservative aims). Instead, Fish contends that colleges and universities should not engage in civic advocacy at all. “Neither social transformation nor unabashed patriotism is an appropriate goal of the classroom experience,” (2017, para. 7), writes Fish. While Fish favors the teaching of civic literacy, which he does not define beyond an acknowledgment that it encompasses “a basic understanding of [American]

government” (2017, para. 9), he rejects the idea that the formation of a certain type of citizen should number among colleges’ objectives.

Fake News and Pedagogy Outside Writing Studies

While this chapter has thus far focused almost exclusively on the field of writing and rhetoric, this should not be interpreted as a sign that researchers in fields like rhetoric and composition dominate scholarly conversations about fake news. Far from it: a plethora of promising research related to fake news and civic education since 2016 has occurred outside of writing studies. Scholars in a variety of fields in the humanities and social sciences have sought answers to the most pressing questions surrounding fake news: how can scholars define it? How does it spread? What can be done to minimize its impact? Though it is impossible to review all this work, summarizing recent contributions in a few narrow areas of study is necessary because this study engages directly with ideas that these works invoke. Thus, this section briefly overviews important developments in educational research related to fake news before offering a more detailed explication of a specific concept—Civic Online Reasoning—that is crucial to understanding the study at the center of this dissertation.

Since 2016, a growing body of research in education, educational psychology, library/information science, and associated fields has centered on questions of how students are affected by fake news and how educational interventions can address these effects (Lee, 2018; Leeder, 2019; McDougall et al., 2019; McGrew, 2020; McGrew et al., 2018; Pérez et al., 2018; Richardson, 2017; Vosoughi et al., 2018; Wineburg & McGrew, 2019; see also Journell, 2019). These fields do not often situate their studies within composition classrooms. However, research has suggested that current educational approaches *in general* do not adequately prepare students to distinguish fake news from real (Barzilai & Zohar, 2012; Boczkowski et al., 2017; List et al., 2016; McGrew, 2020; McGrew et al., 2018; Stanford History Education Group, 2016; Wineburg & McGrew, 2019). Thus, it is plausible—perhaps even likely—that writing teachers can stand to gain by adapting interventions developed outside the field for their own educational purposes.

The interventions that researchers in fields like education, educational psychology, and library/information science have proposed to remedy students’ susceptibility to fake news frequently revolve around the concepts of critical thinking and sourcing. These are related concepts that are important to the study at the center of this dissertation. Critical thinking is a

notoriously difficult-to-define construct that has been conceptualized differently by various disciplines. One influential definition of critical thinking based on the consensus opinion of experts in the field of education posits that it is an individual's judgment of "intentional self-regulation which results in interpretation, analysis, evaluation and inference, [and] explanation of the evidential, conceptual, methodological, criteriological or contextual considerations upon which this judgment is based on" (Facione, 1990, p. 3). Pithers and Soden (2000) cast critical thinking as a set of skills involved in "identifying a problem and its associated assumptions; clarifying and focusing the problem; and analyzing, understanding and making use of inferences, inductive and deductive logic" (p. 239), in addition to making judgments about the strength of the information available. By contrast, "sourcing" refers to "the act of looking first to the source of [a] document before reading the body of the text" (Wineburg 1991, p. 77) or, more generally, "any mental process directed to (explicitly or implicitly) pay attention to, evaluate, integrate, memorize and/or make a decision by using source information" (Pérez et al., 2018, p. 54).

Research has indicated that various measures of both critical thinking and sourcing tend to respond to educational interventions. A systematic review of intervention studies in higher education settings, for example, revealed that studies in a variety of academic fields employed effective strategies for imparting critical thinking (Puig et al., 2019). Similarly, recent research suggests that sourcing skills can be imparted through relatively modest, straightforward interventions (Pérez et al., 2018). These results are broadly in line with prior investigations of sourcing interventions at the high school (Braasch et al., 2013; Mason et al., 2014) and undergraduate (Wiley et al., 2009) levels. While the precise effect of these interventions can vary based on the nature of the intervention, the educational context, and various student factors in general, the fact that students' sourcing skills respond to training is a durable one.

Researchers in fields like education, educational psychology, and library/information science have also sought to understand whether (and how) student populations respond to fake news differently than other populations. Recent studies have challenged the narrative that younger generations are "digital natives" (i.e., that they are especially deft at navigating online media). In fact, younger Americans may be especially likely to fall for fake news (McGrew et al., 2018). This may be at least in part because they rely heavily on social media for news information (Leeder, 2019). Fake news spreads more readily than real news on social media (Vosoughi et al., 2018), and social media users tend to prioritize qualities like self-expression (as

opposed to accuracy) when sharing news items on social media platforms (Chen et al., 2015). Thus, populations that rely primarily on shared social media content for news information—like young Americans—may be at greater risk for misinformation. These conclusions are largely in line with research that predates the emergence of fake news as a topic of widespread interest, which has similarly found that young student populations, despite their reputations as digital natives, are not especially skilled at evaluating online information (see, e.g., Bennett et al., 2008; Eagleton et al., 2003; Gasser et al., 2012).

It also perhaps not surprising that scholars in fields like history, social studies, and political science have contributed to the conversation surround fake news, given its ramifications for civic life. One of the most influential contributors to scholarly conversations about fake news in these fields has been the Stanford History Education Group (SHEG). Formed in 2002, SHEG is a research organization that develops free lessons, assessments, and teacher guides that aim to give teachers “high-quality resources to enrich students’ intellectual experience in the history classroom” (Stanford History Education Group, n.d.a). Its most popular resource, the *Reading Like a Historian* curriculum, has been downloaded more than 6 million times (Stanford History Education Group, n.d.a). The organization’s scholarly output is considerable: at the time this literature review was written, SHEG-affiliated scholars had published a total of 37 research articles, five books, and 20 magazine articles (Stanford History Education Group, n.d.b).

Much of SHEG’s recent work has focused on assessing students’ ability to distinguish between reputable and disreputable sources of information. For example, a recent large study of student participants spanning middle school to college found significant deficiencies in each age group’s ability to determine the reputability of online information (Stanford History Education Group, 2016). SHEG-affiliated scholars have also published pioneering work examining the construct of Civic Online Reasoning, which the next section describes in detail.

Civic Online Reasoning

Civic Online Reasoning (COR) is a psychological construct that refers to a subject’s ability to “search for, evaluate, and verify social and political information online” (McGrew et al., 2018, p. 5). Several recent studies have suggested that curricula that emphasize COR might serve as correctives to perceived deficits in students’ ability to evaluate the veracity of online information (McGrew, 2020; McGrew et al., 2018; Wineburg & McGrew, 2019). These deficits,

which have themselves been documented in scholarly research (e.g., Barzilai & Zohar, 2012; Boczkowski et al., 2017; List et al., 2016; Stanford History Education Group, 2016) can sometimes be significant. For example, a large study of middle school, high school, and college students found that subjects in each age group could not make relatively elementary judgments about whether digital sources of information were credible or not (Stanford History Education Group, 2016). In one study that required high school and college students wrote written assessments of online sources' reliability, only a small minority indicated that a lobbying industry website represented to be an unreliable source (p. 5).

Results like these have been interpreted by COR researchers as evidence that some students lack the basic skills of analytical inquiry vital to informed civic participation. Thus, one early examination of COR defined COR as comprised of three main questions or competencies (McGrew et al., 2018): “Who is behind the information?”, “What is the evidence?”, and “What do other sources say?” These competencies derive from research of professional fact checkers (e.g., Wineburg & McGrew, 2019), which identified a variety of behaviors and thought processes that tend to differentiate fact checkers from generic internet users. These include, for instance, lateral reading, the tendency to seek new sources to determine an original source's reliability, rather than judging its reliability using only the content and features only of the source itself (vertical reading). Each of the competencies outlined by McGrew et al. encompasses one or more of these behaviors or thought processes. The competencies are briefly described below (McGrew et al., 2018, p. 168):

- “Who is behind the information?” refers to a subject's ability to determine a given source's author, ascertain relevant group loyalties of that author, surmise that author's likely motives for presenting the information contained in the source, and make an accurate judgment about whether to consider the author trustworthy.
- “What is the evidence?” refers to a subject's ability to determine what evidence a given source provides, where that evidence comes from (e.g., which external sources provide the evidence), and whether the source's evidence supports its main claims.
- “What do other sources say?” refers to a subject's ability to identify additional sources that offer useful perspectives on the topic of interest and the credibility of the original source and to synthesize these additional sources to make an accurate judgment about the original source's credibility.

In more recent efforts to study COR, researchers have focused on concrete sets of skills. For instance, McGrew (2020) measures COR growth via an instrument that assesses each of the following four component skills. McGrew argues that each skill corresponds to one or more of the competencies described above. These skills are:

- “Ad Analysis,” or students’ ability to differentiate sponsored news content from traditional bylined content and determine why the former is a less reputable source of information. This skill corresponds to “Who is behind the information?”
- “Lateral Reading,” or students’ ability to determine whether a piece of web content is trustworthy based on information gleaned from other online sources about the original source. This skill corresponds to “Who is behind this information?” and “What do other sources say?”
- “Evidence Analysis,” or students’ ability to determine whether a piece of content posted on social media adequately supports a given claim. This skill corresponds to “What is the evidence?”
- “Claim Research,” or students’ ability to determine whether given claims and arguments are valid using internet sources and tools like search engines. This skill corresponds to all three of the competencies above.

Though the body of scholarly COR research is only several years old, evidence has already emerged that suggests that COR can be affected by explicit educational instruction. McGrew (2020) found that limited interventions (eight lessons spread across eight weeks of normal instruction) produce gains in student scores on pre/post assessments of COR, for instance. Older studies investigating COR-like constructs and skills point to similar results. Zhang and Duke (2011), for example, found that elementary students improved in some (though not all) aspects of their ability to evaluate online information after being trained in a novel educational framework. Walraven et al. (2013) found similar effects for high school students who completed a history curriculum that emphasized evaluation of online information. Likewise, Kammerer et al. (2015) achieved significant results in adults who had not received a college education following a short, self-directed intervention in source evaluation.

Research into the broader construct of media literacy provides greater evidence still. Media literacy has been studied more extensively than COR, and, indeed, some large and robust studies billed as examinations of “media literacy” even study skill domains very similar to COR.

For example, a large study of individuals aged 15 to 27 (Kahne & Bowyer, 2017) found that prior history of media literacy education predicted participants' ability to judge simulated online posts' accuracy. Other media literacy research has demonstrated that even very modest one-time interventions like PSAs can affect students' perception of news content under certain circumstances (Vraga & Tully, 2016). If COR is indeed a subset of media literacy, as has been suggested in recent COR research (Wineburg & McGrew, 2019), studies like these would suggest that COR could be affected by educational instruction—a conclusion supported by the limited number of COR studies that already exist.

While the hypothesis that educational interventions can impart COR is well-supported by the available literature, it is much less clear which kinds of interventions are most effective. For this reason, many intervention studies targeting COR or COR-adjacent traits have achieved limited or partial results. The intervention used by McGrew (2020) failed to produce a significant gain in the ad identification task, for instance. Likewise, the intervention in Zhang and Duke (2011) failed to improve students' rankings of the relative trustworthiness of the websites used in the study to a significant degree. While Walraven et al. (2013) did produce a significant gain in students' ability to evaluate online information, these gains did not transfer to environments outside the classroom. The lack of a clear scholarly consensus on how best to design and administer curricula that help students learn the skills of COR point to a need for new intervention studies that investigate these questions systematically.

Conclusion: An Empirical Gap

By reviewing vital research from a variety of disciplines, this chapter has offered an overview of current scholarly understandings of fake news, digital literacies, civic education, and other topics crucial to this dissertation. It has provided a survey of attempts in the field of writing studies to understand not only fake news, but also the media, platforms, processes, and audiences associated with it. It has shown how these understandings shifted in the wake of the 2016 presidential election. It has illustrated the connections between the concept of digital literacy—a concept originating in media studies—and work in writing studies concerned with fake news. It has shown how the concept of civic education has influenced writing studies since the birth of the discipline and how it continues to influence it today. It has shown how the notion that writing instruction and civic education are linked is widely—albeit not universally—acknowledged in

the field. Finally, it has demonstrated that scholars in writing and rhetoric are not the only academics tackling questions related to fake news. It has highlighted the work of scholars studying sourcing and critical thinking, and it has shown how the construct of Civic Online Reasoning has developed from these efforts. By discussing these topics, the literature review not only provides a background for understanding the key topics of this dissertation, but also situates this dissertation within several distinct and ongoing scholarly discourses about fake news. These include discourses in writing studies as well as broader cross-disciplinary discussions about how to understand and respond to fake news.

However, this literature review also suggests another important conclusion by way of what it has *not* documented. Precious little writing studies research has sought to discover how the mundane educational interventions of the composition classroom affect students' ability to detect, judge, and interpret the fake news they encounter every day. Less still has employed empirical, quantitative methodologies in order to make these discoveries. As a result, writing studies researchers have made strides in understanding how fake news functions in terms of genres, texts, and discursive systems, but they have scarcely begun to gather evidence that can explain how fake news should best be addressed in the classroom. This has contributed to a disciplinary status quo in which writing teachers who wish to help their students become competent adult citizens can easily find theoretical, conceptual, anecdotal, or narrative-form guidance even as practical, specific, and evidence-based work remains rare. However, this has not stopped writing studies scholars from offering bold claims about how teachers in their discipline can contribute to the fight against fake news (see, e.g., Carrillo, 2018; Duffy, 2017; Gagnon, 2019; McComiskey, 2017; Sundvall & Fredlund, 2017). These claims are promising, and it may be the case that some (or even all) contain some truth. Yet without empirical evidence, it is difficult to determine which ones are most effective, much less which ones can be replicated at scale or adjusted to fit a diverse variety of educational contexts.

Of course, this is not to say that theoretical and qualitative research do not play a vital role in the development of new knowledge. Nor is it a bad thing that their associated methodologies are considered mainstays of writing studies research. Nevertheless, this status quo puts writing teachers at a disadvantage in the classroom by denying them a category of evidence that could inform decisions about curricula and classroom practices. More broadly, this status

quo impoverishes writing studies as a scholarly discipline because it ensures that those who want to do something about fake news in the classroom will not turn to us for answers.

Teachers and program administrators designing educational experiences to prepare students to deal with fake news must currently turn to other disciplines to find the clearest guidance for how to do so. They must turn, for instance, to the field of history to find studies demonstrating which teaching interventions help students distinguish fake news from real on social media. They must turn to library/information science for evidence-based understandings of how students search for and interpret information online. They must turn to educational psychology to find research featuring the methodologies and analytical strategies that can prove which remedial strategies are most durable and replicable. Writing studies can help them understand how fake news functions as a rhetorical genre, or even how fake news texts are shaped by the technological systems that produce and distribute them. These are worthwhile things. However, these are not the same things as teaching them what they should do about fake news in their classrooms.

This is an unfortunate situation because, as McComiskey and others argue, writing and rhetoric scholars *are* uniquely positioned to lead the educational community's response to fake news. First-year composition courses are required at colleges across the country, and, at some schools, these courses are one of the few that will expose students to humanistic ways of thinking. Moreover, these courses already teach the fundamentals of argument, research, analysis, and source evaluation—skills, in other words, that can help students distinguish between right and wrong information. What better course could exist for preparing the next generation of students for life as responsible, critical, fake news-shunning citizens?

The study described in this dissertation, which centers on a single construct and a single educational environment, only offers a modest contribution to knowledge in the field. Much work will remain until writing studies' empirical research gap will begin to close. However, with luck, the study's results will suggest avenues for research that can continue to clarify what writing teachers should do in their classrooms. They will also hopefully begin a conversation within the discipline that spurs greater interest not only in the topic of fake news, but also in the methodologies and analytical approaches that can help scholars of writing understand fake news in new and helpful ways. The next chapter discusses the procedures used to conduct the study at

the center of this dissertation in detail, and, in doing so, illuminates a few of these methodologies and approaches.

CHAPTER 3: METHODS

This chapter discusses the methods, materials, and procedures used to perform the study featured in this dissertation. The study features two parts. The first part uses a short test administered before and after a First-Year Composition (FYC) course to assess students' Civic Online Reasoning (COR). The second part applies a textual analysis to instructor course documents in order to identify curricular factors that may contribute to student COR gains.

As mentioned in Chapter 1, the research questions for this dissertation were:

1. Do first-year composition (FYC) courses with learning outcomes that emphasize skills like critical thinking, digital literacy, and source evaluation produce gains in civic literacy skills, even when these courses lack an explicit civic component?
2. If so, do differences in course curricula correspond to differences in students' mastery of these civic literacy skills?

Thus, this study examined the COR ability of students enrolled in courses that shared the aforementioned learning outcomes but featured different syllabus themes, assignments, reading lists, and scoring criteria (i.e., different curricula). These curricular differences were of interest because they may have contributed to differences in students' COR gains. However, it is important to note that this was an exploratory study. This means that the study could not definitively verify a causal relationship between any curricular factors and students' COR gains. Instead, the study aimed simply to highlight which curricular factors *might* produce score gains so that these factors can be more systematically examined in future research.

This chapter begins with a pair of clarifying notes. The first offers a brief definition and discussion of “constructed-response” items, which feature prominently in the assessment at the core of this study. The second describes several unanticipated challenges that arose as a result of the COVID-19 pandemic of 2020, which occurred as preparation for this study was concluding and persisted throughout the data collection phase of the study. Following this, the chapter directly addresses the dissertation study. First, the COR assessment instrument (i.e., the test) is described, and the procedures for its administration are outlined. The methods for recruiting participants are detailed, and relevant characteristics of the participating instructors and students are discussed. Next, the qualitative portion of the study is discussed. The procedures for

gathering documents from participating instructors are discussed, and the methodology used to analyze, code, and interpret these documents is described. This section also includes a brief discussion of how coding schema function as qualitative, empirical methodologies in general. Next, the chapter describes the various forms of data that each portion of the study produced and details how these data were analyzed for significant trends. For the quantitative portion of the study, this means a discussion of individual change statistics, which are vital to the analysis of the results, as well as a discussion of other common statistical procedures. The discussion of qualitative data is somewhat more complex. Due to the iterative nature of the coding strategy used for the qualitative portion of this study, flexible approaches to collecting and interpreting data were necessary. Thus, it was impossible to make final judgments about how data from this portion of the study would be analyzed prior to gathering it. For this reason, the chapter describes the general process used to code and re-code textual data from the gathered documents and details the initial coding scheme in full. A more detailed discussion of the coding process—including a discussion of the specific changes implemented in response to initial coding results—appears in the next chapter. Next, the chapter discusses the measures taken to ensure that the qualitative portion of this study was as valid and useful as possible, given the aforementioned areas of uncertainty. Finally, the chapter concludes by summarizing the quantitative and qualitative data sources generated by the study and describing the procedures used for their analysis.

Note Regarding Constructed-Response Items

The study in this dissertation mainly relied on a type of question called a “constructed-response” item to measure COR (though it bears mentioning that the survey also contains several multiple-choice items as well—one relevant to COR, and a few used for demographic purposes). In popular usage, constructed-response questions are usually referred to as “short answer” questions. In these questions, student participants must respond to prompts by composing short written responses. The survey’s reliance on constructed-response items added a degree of complexity to the study, as written answers cannot definitively be evaluated as correct or incorrect in the same way that, for instance, multiple choice questions can be. Instead, students’ responses had to be evaluated for evidence that the student had demonstrated mastery of COR. Though some automatic essay-evaluation software exists (see, e.g., Ernst, 2020), researchers

differ as to whether this software can evaluate writing with the fluency and nuance of a sentient reader. In any case, no known software exists to evaluate writing specifically for the presence or absence of COR. Thus, the constructed-response items in this study were scored by human raters using a rubric. More information about this process is provided below.

Note Regarding COVID-19

The unique circumstances of the semesters during which this study was conducted necessitated several (unfortunately unavoidable) changes to the procedures that were originally planned. These are worth mentioning because the deviation from these original procedures could conceivably have affected the study's results. The COVID-19 pandemic, which began in early 2020 and persisted until the point this document was completed, prompted a variety of drastic changes to higher education across the globe. Purdue University and its Introductory Composition at Purdue (ICaP) program were no exceptions. Normally, individual sections of the first-year writing courses ENGL 106 and 108 meet in a computer lab once per week, so the instrument, which was to be administered electronically, would have been offered on each participating section's computer lab day. While the timespan between the initial and final assessments would have been identical for all participating sections, some sections would have taken the assessment on different days than others.

However, the measures Purdue University took in response to COVID-19 significantly altered the typical ICaP course experience. The most important change is that none of the sections of ENGL 106 and 108 that were originally planned for in-person instruction during the Fall 2020 semester took place in a traditional classroom. Instead, they occurred in hybrid, remote, or fully online classrooms. Hybrid courses contain in-person components, but the logistical aspects of ICaP's hybrid courses made administering the study as originally planned impossible. In a hybrid course, students in a course are divided into several small groups. Each of these groups attends lectures in person on a predetermined day of the week. The instructor assigns the rest of the students independent work they complete outside of class to compensate for their lack of in-person attendance. The groups cycle so that each receives a single day of in-person instruction each week, and each of the groups receives the same content during their lecture section so that all groups progress through the curriculum at the same rate. The goal of this arrangement is to minimize the number of students in the classroom at any given time, as

well as the number of different students in the course who ever come into physical contact with each other. Due to this hybrid structure, as well as to concerns for social distancing, air quality, and lab availability, none of the hybrid ICaP courses administered this semester met in computer classrooms.

When the participating instructors were originally recruited for this study in February 2020, the vast majority of ICaP courses scheduled for the fall were traditional face-to-face courses. There was little reason at the time to believe that these courses would not proceed as planned. However, by the time the Fall 2020 semester began, every instructor participating in this study had switched to either online instruction or a fully remote version of the hybrid course option (i.e., rather than meeting in person, students meet online during the time when the course would have originally taken place via videoconferencing service like Zoom). Thus, the results of this study cannot be interpreted as representative of “typical” (read: face-to-face) FYC instruction.

However, the results should still be useful (albeit in a different way than originally planned). Remote and online teaching formats are large and growing forces in higher education. In 2017, 19.7 million students enrolled in American postsecondary institutions—of these, 6.6 million enrolled in some form of distance education or online course (Educationdata.org, 2020). By fall 2018, this number had increased to 6.9 million (National Center for Education Statistics, 2020). During the pandemic of 2020, colleges and universities across the country were forced to transition to online and remote learning en masse. At the time of writing, it was unclear how long the precautions put into place during the pandemic would last. It was also unclear to what extent higher education would eventually revert to a status quo favoring in-person offerings. What did seem clear is that online and remote education would, in some form, remain parts of the higher education ecosystem for the foreseeable future. For this reason, the results of this study should still have relevance for educators and administrators.

COR Assessment Instrument

This project used a digital assessment instrument comprised of four multi-part, constructed-response (i.e., short-answer) items to assess COR change in students enrolled in participating sections of ENGL 106 and ENGL 108. A prior study was able to administer the instrument in 30 minutes (McGrew 2020). The instrument was administered once during the first

two weeks of the sixteen-week semester and once during the final two weeks (i.e., during either the first or second week and again during either the fifteenth or sixteenth week), with the precise dates varying to account for participating instructors' schedules. The instrument was administered via Qualtrics, a robust online survey platform made available to Purdue students and researchers. Each participating instructor received a link to a separate Qualtrics survey. However, each of these surveys was identical to the others in terms of form and content. This step was taken to allow data from each of the participating instructors to be differentiated from each of the others.

The survey instrument in this study measured the four component skills of COR outlined in McGrew (2020): Ad Identification, Lateral Reading, Evidence Analysis, and Claim Research. Each skill was assessed via constructed-response items or a combination of multiple choice and constructed-response items. One component, "Claim Research," encompassed two constructed-response prompts. Another, "Lateral Reading," encompassed a single multiple-choice item and a separate constructed-response item. Thus, if counting each opportunity that the student is given to write as a separate item, there were five total constructed-response items in the assessment (plus the multiple-choice item). The pre and post versions of the entire assessment, including a short series of concluding demographic questions, are reproduced in Appendix A.

A brief description of each item follows.

- The "Ad Identification" item presented students with the top portions of two webpages that host online articles. Thus, students were able to view the headline, byline, and opening remarks of the articles, but not the body text. One article was a traditional news story, while the other was sponsored content—i.e., a piece of native advertising purchased by an external organization but written and formatted in ways that make it resemble a news story. Students were asked to determine which one was the more reliable source and write a brief response explaining their choice.
- The "Lateral Reading" item presented students with an online article and asked them to determine whether the article represented a trustworthy source of information. Students were explicitly directed to use any online resources they wished to aid in their judgments. They were asked to explain their choice by indicating "yes" or "no" to the first prompt below via a multiple-choice item and composing a brief written response to the second prompt:

- 1: Is this a reliable source of information about [the article’s topic]?
- 2: Explain your answer, citing evidence from the webpages you used.
- The “Evidence Analysis” item presented students with a photograph shared on social media. The image was accompanied by contextualizing commentary from the user sharing the photograph, as is common practice on social media. This commentary made an implicit argument about what the image signified that was not necessarily supported by the content of the image itself. Students were asked to determine whether or not the post represented compelling evidence for the user’s claims and to explain their choice in a single written response.
- The “Claim Research” item presented students with a historical claim about a controversial political topic. For instance, one item (as described by McGrew (2020)) presented the claim that Margaret Sanger (founder of Planned Parenthood) supported euthanasia. The item asked students to investigate the claim using any online resources they wished, then to determine whether the claim was accurate. The students were then asked to explain their decision via brief written responses to the following prompts:
 - 1: Do you believe [claim in question]? Explain using evidence from the websites you consulted.
 - 2: Explain why the sources you used are strong.

Student responses to each constructed-response item were scored via the rubrics SHEG provided for the items used in this study (see, e.g., McGrew (2020)). Two independent raters scored the corpus of student responses. Before scoring, raters participated in a norming session to build a reliable consensus for interpreting the rubric scales. The primary researcher acted as facilitator for the norming session while the raters scored several samples of student work. These samples were examples of student responses for each item provided by SHEG—not responses taken from participants in the study. After scoring the samples, the raters revealed their scores, and the facilitator began a conversation about any apparent areas of agreement and disagreement. Participants were invited to discuss their rationale for awarding particular scores and to share their interpretations of the directions provided with the rubric. The objective of this conversation was to help the raters arrive at a mutual understanding of how a range of student responses should be scored. The norming process (including the conversation phase) was repeated three times so that raters could gain a clear understanding of how typical responses ought to be rated

and have their questions about the rubric answered. Following the norming session, the scoring proper commenced. A weighted value for Cohen's Kappa that accounted for the ordinal nature of the scale ratings (per Fleiss & Cohen, 1973) was used to calculate a statistic for interrater reliability after scoring concluded. Given the relative compactness of the rubrics, any student responses for which two or more raters' scores differed by more than one point were flagged for review.

Except for the Claim Research item, each item was scored via a three-point rubric with scale points corresponding to "Beginning," "Emerging," and "Mastery" skill levels. The Claim Research item was scored via a four-point rubric containing one additional skill level, "Partial Mastery," between "Emerging" and "Mastery." This is because pilot studies had determined Claim Research to be a more complex trait than the other three (Wineburg & McGrew, 2019).

Student scores were converted to numerical form by awarding points for each item. On the three-point rubrics, the lowest skill level, Beginning, corresponded to 0 points, Emerging corresponded to 1 point, and Mastery corresponded to 2 points. On the four-point rubric for Claim Research, Partial Mastery corresponded to 2 points and Mastery corresponded to 3 points. For more information about the rubrics used to score each item, consult McGrew (2020, pp. 10-11), which contains a complete reproduction of each rubric along with numerous examples. The item rubrics are also reproduced (in table form) in Appendix B.

According to McGrew (2020), mentions of "reliable sources" in the rubrics above refer to sources with "well-established research or journalistic credentials themselves and/or [those that] accurately cited sources with established credentials" (p. 11). These sources typically "had authors with professional backgrounds in journalism or history and processes in place to ensure the accuracy of their materials (e.g., editors, fact checkers, and avenues to issue corrections when necessary)" (p. 11).

Curricular Content Analysis

In addition to measuring student COR growth via the aforementioned COR assessment, this project investigated likely contributing factors for COR growth (and, conversely, the lack thereof) via a content analysis of key course documents. Following the COR post-test, participating instructors submitted their course syllabi and assignment sheets for analysis. Here, the label "assignment sheet" refers to a document that provided direction to students on a major

course project or assignment. For example, a document distributed to students that explained the content, format, and desired outcomes of a research paper required for credit would qualify as an assignment sheet. However, other kinds of documents that mentioned assignments or their requirements but did not serve as the primary written source of direction for the assignment did not qualify. For example, course calendars that indicated when major assignments were due but that did not contain detailed information about what the student should do to receive credit on the assignment were not considered assignment sheets for the purpose of this study.

The syllabi and assignment sheets gathered for use in this study were analyzed via a thematic coding scheme. Coding is an empirical, qualitative form of analysis used to identify patterns in textual data (and, from those patterns, grander conclusions about the texts) (Saldaña, 2016). Numerous approaches to coding exist. Coding schemes can center around a wide variety of criteria: textual themes, grammatical features, emotions or affective qualities, literary motifs, argumentative structures, and more. Codes can also either be developed from texts themselves (these are termed “grounded” codes), or they can be assigned based on *a priori* sets of criteria. Because the main points of inquiry for this study were already known, it was possible to assemble a set of themes and concepts that the coding would revolve around before beginning the coding process. These are listed below.

- Themes and claims that directly or implicitly referenced any of the key competencies of COR (“Who is behind the information?” “What is the evidence?” “What do other sources say?”). Examples include instructions on assignment sheets that directed students to scrutinize the authors of external sources and passages in syllabi that described the course as involving evaluation of evidence.
- Themes and claims that directly or implicitly referenced any of the skills measured by the COR assessment (“Ad Identification,” etc.). Examples included portions of assignment sheets that suggested students would need to evaluate the validity of certain arguments in light of a given body of evidence.
- References to the skills of critical thinking, reading, writing, or analysis. Examples included portions of assignment sheets that described the ways students would need to scrutinize the claims in certain texts or compose their own interpretations of these claims.

- References to the notions of citizenship or civic responsibility. One example would be a portion of a syllabus that posited that the FYC course would give students the skills to be responsible citizens.
- References to the notion of evaluating the quality of sources in real-world contexts. Examples included portions of assignment sheets that claimed that a particular assignment would require or teach this skill and portions of syllabi that described source evaluation as a central component of the course.
- References to the notions of misinformation, disinformation, or fake news. One example would be a portion of an assignment sheet for an editorial project that referenced fake news while describing how to persuade ethically.
- References to digital spaces as important locations for discourse or writing. An example would be a portion of a syllabus that listed “proficiency in digital modes of composition” (or a similarly defined skill) as an important course outcome.

An important caveat to this list is that it was difficult to anticipate every potentially relevant theme before seeing instructors’ documents. For this reason, additional themes were added as the first round of coding proceeded. These are listed below:

- Boilerplate—instances of writing that instructors were required to add to their course documents to satisfy bureaucratic requirements mandated by their university, college, department, or program.
- References to research skills. An example would be a portion of an assignment sheet that mentions that, as part of the assignment, students will need to conduct either primary or secondary research, or that they will need to synthesize prior research in order to craft a coherent argument.
- References to the notions of rhetoric, the rhetorical situation, argument, persuasion, or rhetorical appeals.
- References to the task of expository or explanatory writing, including calls to include clear descriptions or explanations within a larger piece of writing.
- References to the formal features or organizational schema that distinguish a specific genre or piece of writing.
- References to the principles of inclusivity or diversity.

- References to multimedia or multimodality, including discussion of composing for non-text media like video and audio.
- References to the acts of reflection, peer review, and self-assessment—tasks that require the writer to think metacognitively about their own compositions or another writer’s.
- References to research skills separate from source evaluation.
- References to sentence-level style concerns.

The coding process consisted of multiple cycles designed to progressively refine codes over time so that observable patterns emerged from the data. This process is described in detail in Saldaña (2016, Ch. 3, 4, 5, 6). It is summarized briefly below.

- Saldaña (2016) describes the first cycle of descriptive coding as a way of “analyzing the data’s basic topics to assist with answering [general] questions” (p. 102). Turner (1994), similarly, refers to this cycle as a process that develops a “basic vocabulary” that can be used to describe the data (p. 199). In this cycle, the researcher summarizes the topic of passages in the text via labels that take the form of words or short phrases. Crucially, it is the topic of each passage—and not the content or message—that must be expressed in each initial code. Saldaña (2016) provides an illustrative example: an ethnographer’s account of a walk through an impoverished inner-city neighborhood produces codes like “buildings,” “graffiti,” and “businesses,” rather than “poverty,” “urban decay,” and so on (p. 103).
- Following the first coding cycle, Saldaña (2016) recommends subjecting initial codes to a process called code mapping. Code mapping organizes groups of codes into broad categories based on their similarities. Saldaña describes, for example, how 52 codes assigned to teachers’ accounts of a controversial new set of educational standards were mapped to eight categories, which included “people,” “institutions,” and “curricula” (p. 220). Following this, a second round of mapping categorizes the categories formulated in the first round. In Saldaña’s (2016) example, for instance, “people” and “institutions” were both organized under “human and institutional conflicts” (p. 222). Additional cycles of code mapping can be performed beyond the second as needed.
- The second cycle of coding, which Saldaña (2016) describes as optional, aims to “develop a sense of categorical, thematic, conceptual, and/or theoretical organization

from ... first cycle codes” (p. 234). In this respect it resembles code mapping. However, whereas code mapping classifies and describes first cycle codes, second cycle coding (and all subsequent cycles) moves the data toward major themes and concepts in order to support general assertions about the data. For example, Saldaña (2016) describes how a variety of codes assigned to interviews of staff members at a troubled workplace were assigned the meta-code “dysfunctional direction” (p. 238). This label reflects the fact that all of the initial codes suggested administrative actions with negative consequences.

- If needed, additional cycles of coding can be performed until the researcher is able to posit answers to relevant research questions by analyzing the resulting meta-codes.

In general, course documents were coded in their entirety. However, when scoring rubrics appeared in course documents, they were coded according to the highest-scoring set of descriptions in each scoring category. In other words, only the portions of the rubrics corresponding to maximum points in each scoring category were coded. This was done because these portions of the rubrics contained affirmative descriptions of the qualities the instructors deemed important. By contrast, the other portions of each rubric typically described the absence of various important qualities or else described undesirable qualities. Analyzing these portions of the rubrics would have frequently led the researchers to assign codes to instructors’ descriptions of what students should not do.

Note Regarding Anonymity

It bears repeating that the purpose of this study was not to evaluate the teaching quality of the participating instructors. Instead, it was to investigate whether FYC instruction produces COR gains when it is guided by course outcomes that emphasize critical thinking and source evaluation, and, if so, to identify likely causal factors for future study. For this reason, course documents were carefully de-identified by a neutral third party before being provided to the primary researcher. The third party had an academic background in writing studies but had no material stake in the Purdue English department. This de-identification process made it impossible to associate the materials with any individual instructor, though all of the documents associated with each instructor were labeled in such a way that they could be identified as originating from the same instructor. The third-party de-identifier simply used a random number

generator to assign a numerical ID to each participating instructor. In addition, students were not made to provide their names on the COR assessments, so it was impossible to associate any single set of responses with any student. Instead, a script assigned each student a numerical ID via a random number generator.

Thus, each student was associated with:

- their corresponding pre/post results (i.e., for each individual student, both pre- and post-test results were labeled with the same anonymous ID number)
- their instructor's ID number
- the instructional materials that were gathered from their instructor's course.

However, at no point was the primary researcher able to associate any students' scores on the assessment with their instructors. These anonymity measures were taken out of respect for students' privacy and in order to satisfy IRB regulations governing research with human subjects.

Data Sources

This study drew its conclusions from two main sources of data. One—the data gathered from the COR assessment instrument—was primarily quantitative. The other—the data produced by coding instructors' course documents—was qualitative.

Quantitative Data

The first data source was the student scores collected from the COR assessment administered at the beginning and end of the semester. All participating ENGL 106 and 108 sections contained the course maximum of 20 students at the beginning of the semester (though it is possible that a small number of dropouts may have occurred during the semester). 10 instructors agreed to take part in this study. At twenty students per section, the maximum number of possible participants would have been 200 students. Because enrollment in the survey was voluntary, however, the final number of recruits was 101 on the pre-test and 53 on the post-test.

Students were recruited for the study by the primary researcher via a short presentation in each participating course section during the first week of the semester. Per IRB regulations, students who participated in the study were allowed to earn extra credit equivalent to 2.5% of their course grade. During the Fall 2020 semester, this extra credit incentive was optional, but because of the attrition problems that occurred, during the Spring 2021 semester, it was made mandatory. To ensure that this extra credit did not constitute to a form of coercion, participating instructors were asked to offer their students alternative means to receive an equal amount of extra credit. For example, one instructor opted to allow students to complete a short writing assignment to receive as much extra credit as they would have earned for participating in the survey. As an additional measure to avoid coercion, the primary researcher—and not the course instructor—communicated all information about the study to students. This was done so that students in the course did not feel the need to participate in the study in order to maintain their teacher’s approval. Prior to participation in the study, students were asked to express their desire to participate on an informative consent form approved by the Purdue University IRB. The recruitment script used during the beginning-of-the-semester presentation is available in Appendix C. The consent form is available in Appendix D.

Student responses on the COR assessment instrument were assigned a score via each item’s corresponding rubric (as mentioned above, two raters reviewed the entire corpus of student responses). Total scores were calculated by summing the scores from the four individual items. Two individual-based change statistics, standardized individual difference and reliable change index, were calculated for each student (for a detailed explanation of these statistics, see Estrada et al., 2019). Individual change statistics have been demonstrated to be very closely related to other measures of change commonly used in pre/post studies, like changes in aggregate means). However, they have several important advantages over aggregates. Namely, they allow the identification of individual cases that changed reliably (which is important in many applied contexts), and they allow for more practical interpretations of effect sizes. Once individual change statistics are calculated, these can be aggregated into percentages of reliable individual changes. In the context of this study, these statistics allow for broader claims about the general effectiveness of FYC instruction beyond the level of individual cases.

By comparing students’ scores on pre- and post-tests, it was possible to determine:

- Whether significant COR growth occurred over the course of the semester

- Which individuals were associated with the greatest COR growth

However, statistical comparisons needed to be undertaken with care due to several qualities of the data. For example, the rubrics used to score student responses employed *ordinal scales*, which specify differences in rank or order, but for which differences between scale levels are not necessarily equal. For example, in the case of the Claim Research item, there was no reason to believe that the difference between a score of 3 and a score of 2 was necessarily the same magnitude as the difference between a score of 2 and a score of 1. This stands in contrast to interval scales, which do require equivalent distances between levels. For example, two measurements of 80 and 70 degrees Fahrenheit imply the same difference (10 degrees) as two measurements of 50 and 40 degrees Fahrenheit.

Thus, some statistical procedures commonly used for interval data were inappropriate for the analysis in this study, including many forms of linear regression. It should also be noted that the use of means as indicators of central tendency for ordinal data is the subject of a long-standing controversy among statisticians (see, e.g., Lord, 1953; Sullivan & Artino Jr., 2013). While the researcher has chosen to present mean values of student performance for illustrative purposes at a few key junctures, these values should not be interpreted as evidence of statistically significant differences (for instance, between two participating course sections). Care has also been taken to present any means alongside less controversial measures of central tendency, like medians.² Finally, while ordinal data do not necessarily imply normality (i.e., the quality of being evenly distributed around a central point) or non-normality, previous research (McGrew 2020) suggested that student scores on the COR assessment would not, in fact, be normally distributed. For this reason, some standard parametric methods of analysis like ANOVA were inappropriate, as normality is a prerequisite for these methods.

For all of the reasons just provided, this study employed the Wilcoxon signed-rank test to compare the results of the pre- and post-tests. The Wilcoxon test is a non-parametric statistical test that can be used to compare matched samples (like scores on pre- and post-tests) to assess whether the samples represent populations with significantly different mean ranks. These qualities make the Wilcoxon test appropriate for data that is ordinal and non-normal, both

² Though it also bears mentioning that, in certain contexts, means have been demonstrated to indicate central tendency more clearly than medians (Lewis, 1993).

qualities of the COR assessment score data. Finally, Cronbach's alpha was calculated for each subscale to determine its internal consistency in the context of this study.

Qualitative Data

The second main data source for this study was the collection of thematic codes that emerged when instructor syllabi and assignment sheets were subjected to coding analysis. Saldaña (2016) stresses the inherent difficulty of making concrete predictions about the form these codes will take, much less the patterns that will be observable. Additionally, Saldaña notes that because second-cycle codes derive from first-cycle codes, and because the latter are derived directly from the data itself, any predictions made before the data corpus has been assembled could prove to be overconfident. Thus, it was vital not only to include a degree of flexibility in this study's coding procedures, but also to maintain a degree of openness in imagining the forms the data might take. The next chapter describes the process of applying the first-round codes to the textual corpus, identifying flaws in those first-round codes, refining the codes to remedy those flaws, and generating a final dataset with the newly developed second-round codes in greater detail.

CHAPTER 4: RESULTS

This chapter details the results of the study outlined in the previous chapter. It first presents a brief summary of the results, noting the most important findings. Then, the chapter begins in earnest. It first describes general trends in students' participation. Next, it presents raters' reliability scores and describes difficulties raters encountered in scoring certain items. Then, it describes the results of the pre-post COR assessment administered to students in sections of ENGL 106/108 during the Fall 2020 and Spring 2021 academic semesters at Purdue University in greater detail. This section subjects the data to several statistical analyses to determine the significance of the results. The third section outlines the results of the course document analyses. This includes a brief discussion of the development of the final coding scheme, which was informed by imperfections that became apparent to the researcher as the first round of coding proceeded. The implications of both the quantitative and qualitative portions of the results are discussed in Chapter Five.

Summary of Results

Overall student performance varied on each of the COR assessment items, but not across sections. In general, students struggled with the Ad Identification and Lateral Reading items on the pretest while scoring higher on the Claim Research and Evidence Analysis items. This translated to COR gain scores that significantly differed across items. Students achieved statistically significant positive growth on the Ad Identification and Lateral Reading items, though the size of the growth was small to moderate. However, students' posttest scores on the Claim Research and Evidence Analysis items did not significantly differ from their pretest scores (they declined, but not to a degree that was statistically significant). Additionally, the reliability of raters' scores varied across items. While the two primary raters achieved satisfactory interrater reliability on the Ad Identification and Lateral Reading items, their judgments were less reliable on the Claim Research and Evidence Analysis items, with Claim Research scores being especially unreliable. A third rater to judged student responses to the latter two items. However, using this rater's scores did not cause the interrater reliability for these items to increase.

Additionally, all three raters reported that the Claim Research item was more difficult to assess reliably than the other items.

Several individual student participants' gain scores were so high or low as to differ significantly from their peers'. Two students' gain scores were high enough to produce significantly large reliable change indices. These students shared several demographic qualities (both identified as Asian males). However, there was no assurance that these students' backgrounds are similar despite a surface-level demographic similarity. Similarly, students with the most negative gain scores also appeared to share several demographic qualities (female, third-year status), but there is no compelling evidence that these traits were responsible for the students' performance. Selection bias may also have contributed to these demographic results: for instance, the third-year students who would be required to take a first-year writing course may not be representative of third-year students in general. A broader examination of test-takers' demographic qualities found that most demographic categories (including race, national origin, year of instruction, and academic major) did not appear to interact significantly with students' gain scores. However, there was one exception: students' self-identification as Hispanic or Latino was associated with significantly higher performance on the pretest but significantly lower gain scores. Given the relatively low number of students fitting this category in the sample, the significance of this association is dubious.

The textual analysis of course documents took place over two rounds of coding, with the final coding scheme developed in response to several problems that arose during the first round. The analysis revealed a diversity of assignments, reading lists, and syllabus approaches represented across the five sections of ENGL 106 and 108 that took part in this study. However, despite the apparent variety in these five courses' curricula, no section significantly differed from the others in terms of overall pre/post COR growth. One notable aspect of this result is that it occurred despite three sections' invoking the COR competencies and COR assessment skills in course documents much more frequently than the other two sections did. In fact, the two students with anomalously high COR gain scores were enrolled in the two sections whose documents invoked the COR competencies much less than the other courses' did. Due to a small sample size (the study suffered from heavy attrition effects in some sections), the implication that the course curricula represented in this study do not produce significantly different COR gains should not be taken as a definitive conclusion.

COR Assessment Results

Participation in the COR assessment was subject to substantial attrition—i.e., not every student who completed the “pre” assessment successfully completed the “post” assessment. This effect was especially pronounced during the Fall 2020 semester, when instructors were not required to offer extra credit to their students in exchange for their participation. In the fall, initial participation on the “pre” survey was similar to the equivalent participation in the spring. However, participation on the “post” survey was very low in courses whose instructors had opted not to offer extra credit. By contrast, during the spring, when all instructors offered extra credit, participation on the posttest was only slightly lower than on the pretest. In addition, in both the spring and the fall, some students who began both the pre- and posttests gave only partial or incomplete responses for certain items. Table 1 provides summary information related to participation on the pre and post assessments during each semester.

Table 1. Survey Participation Summary Data

Academic term	Participating course sections	Total participating students		Mean # of participants per section	
		Pre	Post	Pre	Post
Fall 2020	6	54	13	9	2.17
Spring 2021	4	47	40	11.75	10
Totals	10	101	53	12.625	6.625

Note: the figures in this table omit partial/incomplete responses.

Demographic data collected at the end of each survey did not suggest any unexpected trends related to which kinds of students participated. A summary of the demographic data gathered during the study is provided in Tables 2, 3, and 4. Table 2 displays participants’ years of instruction. Table 3 displays students’ college/school affiliation. Table 4 displays information related to students’ race, ethnicity, nationality, and gender. The information in these tables is broadly consistent with what might be expected, given the broader demographic qualities of Purdue’s student population and the fact that course is typically offered to first- and second-year students. However, one notable exception existed: a majority of students who participated in this study identified as female, whereas Purdue’s overall undergraduate student body is majority male (Purdue University, n.d.b). Note that, because demographic questions were presented to

participants at the end of the survey, the figures in Tables 2, 3, and 4 do not account for students who began the survey but did not reach the end.

Table 2. Student Participant Academic Term Data

Academic term	Academic Status							
	First-year		Second-year		Third-year		Fourth-year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Fall 2020	45	10	6	0	2	2	0	0
Spring 2021	34	31	6	6	4	3	0	0

Two trained raters scored the responses of all students who completed both the pretest and posttest. The weighted kappa values for each item prior to the use of a third “tie-breaking” rater are as follows: Ad Identification = 0.77 (“substantial agreement,” per Landis & Koch, 1977); Lateral Reading = 0.63 (“substantial agreement”), Claim Research = 0.33 (“fair agreement”), Evidence Analysis = 0.52 (“moderate agreement”). While the raters never disagreed by more than one scale point on the first two items, 27 such disagreements appeared across the Claim Research and Evidence Analysis items, with the vast majority of these (24) occurring for the Claim Research item. This may have been due to genuine disagreement between raters, but was also likely in part due to this item’s scale having one additional point. A third rater who rated the Claim Research and Evidence Analysis items did not achieve a high level of agreement with either of the other raters. On the Claim Research item, rater three achieved a weighted kappa value of 0.25 with rater 1 and a value of 0.36 with rater 2 (both “fair agreement”). On the Evidence Analysis item, rater three achieved a weighted kappa value of only 0.198 with rater 1 and a value of 0.115 with rater 2 (both “slight agreement”). Additionally, all three raters reported that rating the Claim Research item was more difficult than rating the other items.

Student participants’ responses on each of the COR assessment’s four main items are provided in Table 5. Mean and median information are provided for student performance on each item. However, as noted in the previous chapter, the mean values should be regarded with caution. The rubrics used to score each item assign scores on an ordinal scale, and the use of means as indicators of central tendency for ordinal distributions is controversial (see the *Quantitative Data* portion of chapter 3’s Data Sources section for a lengthier discussion on the

Table 3. Student Participant College/School Data

College/School ^a																						
Ag.		Ed.		Eng.		HHS		LA		Mgmt.		Pharm.		Poly.		Sci.		Vet.		Und.		
Academic Term	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post		
Fall 2020	0	0	2	0	17	5	14	2	2	0	5	2	1	0	0	0	9	2	1	0	2	0
Spring 2021	4	4	2	2	3	3	12	12	4	3	7	6	2	2	2	2	5	5	0	0	3	1

^a Ag. = College of Agriculture, Ed. = College of Education, Eng. = College of Engineering, HHS = College of Health and Human Sciences, LA = College of Liberal Arts, Mgmt. = School of Management, Pharm. = College of Pharmacy, Poly. = Polytechnic Institute, Sci. = College of Science, Vet. = College of Veterinary Medicine, Und. = Other/undecided.

Table 4. Student Participant Demographic Data

Academic term	Race/Ethnicity ^b										Hispanic?		Nationality				Gender							
	White/Caucasian		Black/A.A.		Am. Ind./AK		Asian		HI/PI		Y	N	Dom.		Int.		M	F	Self-ID					
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post				
Fall 2020	39	7	1	0	0	0	11	5	1	0	3	2	48	12	45	10	9	2	30	8	21	4	0	0
Spring 2021	34	28	1	1	1	0	9	7	0	0	4	4	40	36	38	36	6	4	12	12	31	28	1	0

Note: Totals that do not sum to the number of total participants for the term are the result of some participants opting not to provide the relevant demographic information (participants were given this opportunity for each question).

^b A.A. = African American, Am. Ind. = American Indian, AK Native = Alaska Native, HI Native = Native Hawaiian, PI = Pacific Islander

peculiarities of interpreting ordinal data). Means are provided here for descriptive purposes and are not intended to suggest statistically significant differences (Wilcoxon signed-rank tests are used for the latter task).

Table 5. Summary COR Component Task Performance

Academic term	Ad Identification		Lateral Reading		Claim Research		Evidence Analysis	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Fall 2020 Pre-test	0.407	0	0.211	0	2.246	2	1.264	1
Fall 2020 Post-test	0.688	0	0.332	0	1.818	2	1.455	2
Spring 2021 Pre-test	0.367	0	0.4167	0	1.773	2	1.205	1
Spring 2021 Post-test	0.561	0	0.488	0	1.718	2	1.025	1

Significance tests demonstrated two important trends in students' responses: no section improved significantly on the test as a whole, but the entire sample of student participants did improve significantly on specific items. A Wilcoxon signed-rank test did not find significant differences between pre- and posttest results for the sample of all student participants, $z = -0.203$, $p = 0.84$. In other words, when the posttest results of all students who completed the test were compared to the pretest results of the same group of students, these two sets of results were not sufficiently different from each other that the effects of a semester of FYC instruction could be distinguished from random chance. This lack of significance also held true when each participating section was analyzed individually.

However, when the results were examined on an item-by-item basis, the test identified significant growth in students' Ad Identification skill, $z = 1.99$, $p < 0.05$, and Lateral Reading skill, $z = 2.153$, $p < 0.05$. The effect sizes for these items, 0.297 and 0.321, respectively, were also greater than for the other items (conventions vary, but 0.1 and 0.2 are frequently provided as cutoff values for small effect sizes; see, e.g., Ellis, 2009). Though students' gain scores for the other two items tended to be negative, the change in students' scores for these items were not significant. Because students experienced significant positive change on the first two items, the lack of significant positive change on the test overall is likely due to poor performance on the latter two items. In other words, students' Ad Identification and Lateral Reading improvements

were canceled out by their decreased Claim Research and Evidence Analysis performance. Table 6 displays the results of the Wilcoxon tests just described.

Boxplots for students' pre- and posttest scores on each item are provided in Figure 1. These plots graphically display the means (X symbols), medians (horizontal lines), and outlier points (dots) in each set of data. The thick "box" portion of each plot corresponds to the interquartile range. (IQR) is a simple measure of how widely dispersed the results are. IQRs represent the difference between the third quartile (the median of the upper half of the data when all values are arranged in order) and the first quartile (the median of the lower half of the data) for a particular set of values. Thus, the IQR represents the "spread" of the middle 50% of a set of data: a larger IQR implies that the data are spread widely around their central point (the median), while a smaller IQR implies that the data are clustered more tightly around their central point. The whisker-like protrusions in each plot represent the minimum and maximum of each dataset, minus outliers (minimum = $Q1 - 1.5 \times IQR$; maximum = $Q3 + 1.5 \times IQR$). The boxplots in Figure 1 illustrate that, while students' Ad ID and Lateral Reading skill improvements were significant, they were not especially large. They also illustrate that, in most cases, the distributions of posttest scores overlapped with those of pretest scores.

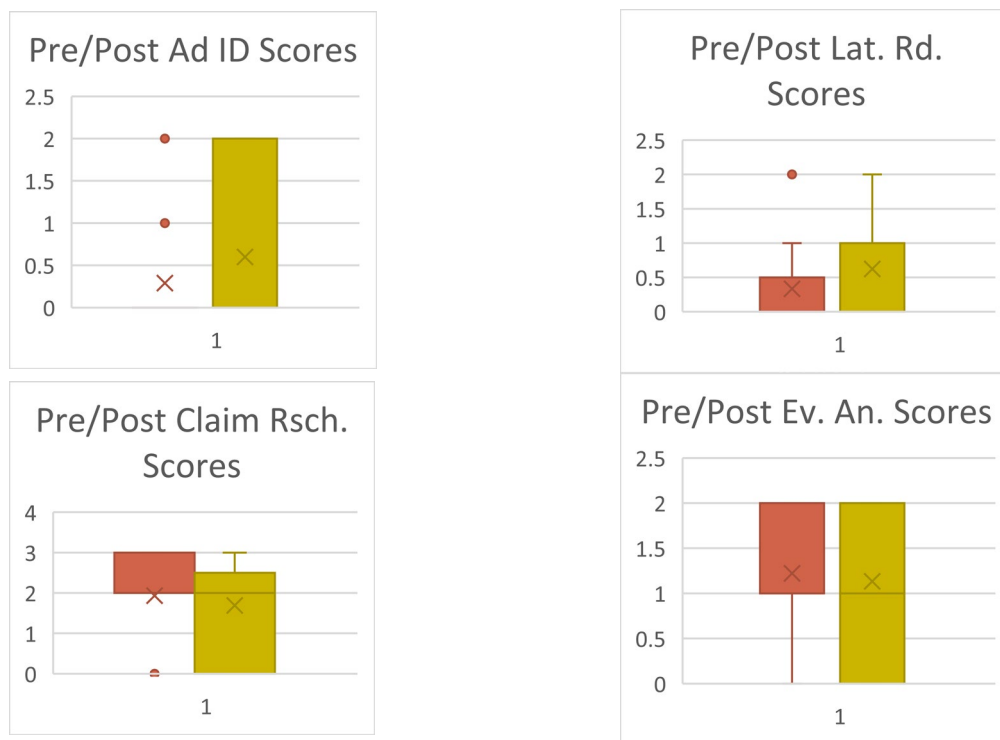


Figure 1. Boxplots of Pre/Post Responses by Item

Table 6. Wilcoxon Signed-Rank Test Results

		<i>n</i>	Mean Gain Score	Median Gain Score	Mode Gain Score	Z-value	Calculated p- value	Effect Size ($Z/\sqrt{n}$)
Entire Test by Section	All Participants	45	0.089	0	1	0.203	0.84	0.03
	Fall A ^a	8	-0.25	-1	-1	0.42	N/A	0.149
	Spring A ^a	5	0.2	1	1	N/A	N/A	N/A
	Spring B	13	0.231	0	1	0.510	0.61	0.141
	Spring C	13	0.231	0	-1	0.356	0.719	0.01
	Spring D ^a	6	0.114	0	1	0.210	N/A	0.086
All Sections by Item	Ad ID	45	0.311	0	0	1.99	0.047	0.297
	Lat. Rd.	45	0.289	0	0	2.153	0.032	0.321
	Claim Rsch.	45	-0.244	0	0	0.85	0.39	0.127
	Ev. An.	45	-0.089	0	0	0.66	0.51	0.098

Note: Rows containing significant p-values are bolded.

^aA Z-value and/or p-value) could not be calculated for certain sections due to low participation.

Table 7. Student Gain Scores on COR Component Tasks (All Sections)

Ad Identification				Lateral Reading				Claim Research				Evidence Analysis			
<i>n</i>	Mean	Median	SD	<i>n</i>	Mean	Median	SD	<i>n</i>	Mean	Median	SD	<i>n</i>	Mean	Median	SD
53	0.17	0	0.98	51	0.12	0	0.78	45	-0.24	0	1.42	47	-0.085	0	1.05

Note: *n* values refer to number of unique students across all sections who completed a given item during both the pre and posttest. Values that do not equal the total numbers of student participants (Table 1) are due to participants completing some items and not others and/or opting not to complete the posttest at all.

Participants' gain scores were calculated by subtracting individual students' performance on given pretest items from their performance on equivalent posttest items. In order to maintain the validity of the analysis, only the section from the fall in which extra credit was offered as an incentive to complete the survey was included with the Spring 2021 sections in the gain score analyses. Sections from the fall in which extra credit was not offered were not included, as these sections suffered from attrition affects that would likely have exerted a selection bias on their results. While the five remaining sections may indeed have suffered from some selection bias insofar as some students may have been more motivated to pursue extra credit opportunities than others, the effects of selection bias in these sections would ostensibly have been similar.

Table 7 provides summary information about student gain scores on each item in the assessment. Negative gain score values correspond to score decreases (i.e., students scoring lower on the posttest than on the pretest). Figure 2 provides a graphical summary of students' gain scores on each item across all sections. Note the slight rightward (positive) skew for the Ad ID and Lateral Reading items.

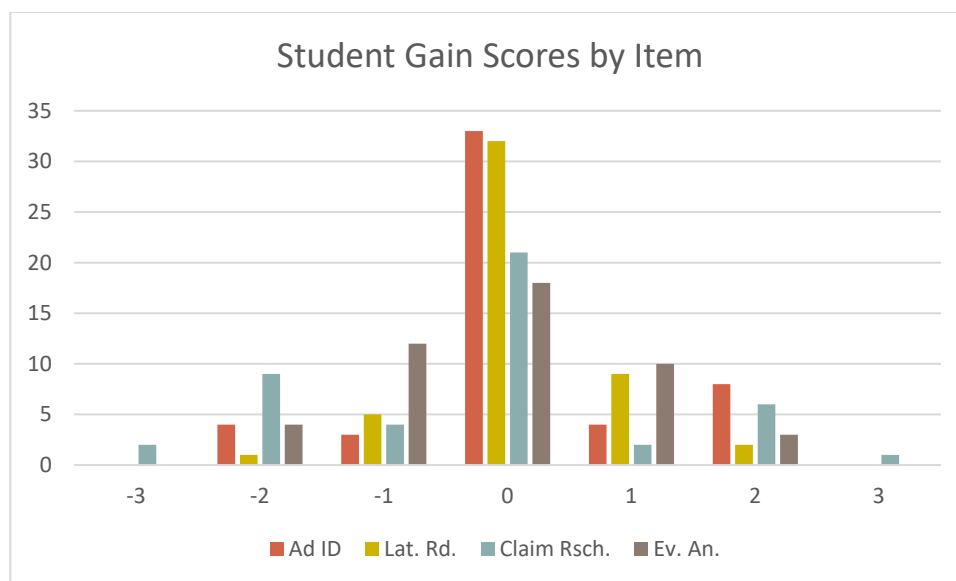


Figure 2. Distributions of Student Gain Scores on COR Component Tasks (All Sections)

Students' performances on the entire assessment were also considered. Scores for the entire assessment were calculated by summing scores for each of the component items. Table 8 provides summary information for students' overall performance on the pretest and posttest.

Table 8. Student Scores on Entire COR Assessment (Pre/Posttest)

Pretest							Posttest					
<i>n</i>	Min.	Max.	Mean	Median	IQR	SD	Min.	Max.	Mean	Median	IQR	SD
45	0	9	3.667	3	1.9	1.91	0	9	3.911	4	2.6	2.13

Table 9 provides summary information for students' overall gain scores (computed by subtracting individuals' overall posttest performance from their overall pretest performance). While the results in this table indicates a wide range of results on the individual level, they are consistent with a small overall improvement in COR performance after one semester of ICaP instruction. Figure 3, which displays students' gain scores for the entire assessment graphically, illustrates that the very small upward trend was due to a plurality of students improving their score by one point on the posttest.

Table 9. Student Gain Scores on Entire COR Assessment

Gain Scores						
<i>n</i>	Min.	Max.	Mean	Median	Mode	IQR
45	-4	5	0.089	0	1	2

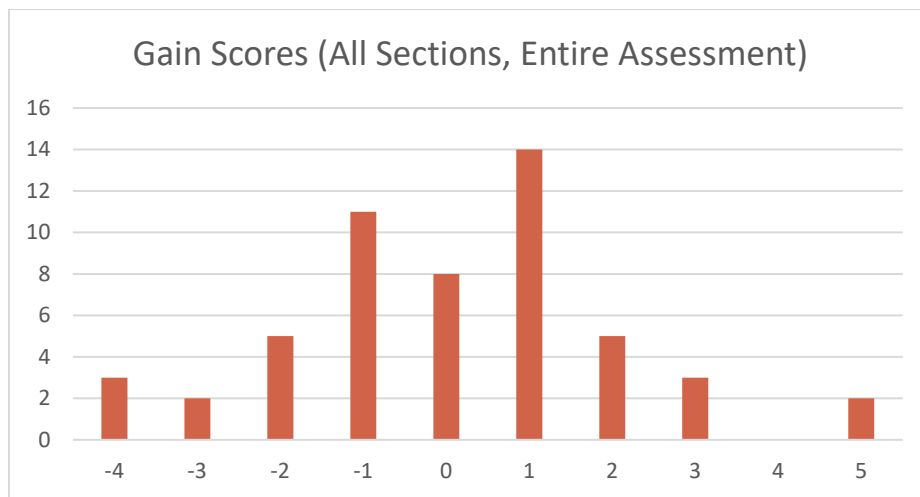


Figure 3. Distribution of Student Gain Scores on Entire COR Assessment

Finally, individual change statistics were calculated for each student participant, allowing the students with the highest and lowest score changes to be identified. Summary information on

these students is presented in Table 10. Three criteria were used to identify noteworthy individual changes. These were as follows:

- Gain scores with absolute values that exceeded the inter-quartile range of the distribution of all gain scores in either direction (i.e., that were > 2).
- Standardized individual differences (SIDs), which are equal to a student's gain score divided by the standard deviation of the distribution of all gain scores.
- Reliable change indices (RCIs), per Estrada et al. (2019).

Table 10. High/low Student Results

Highest Performances										
Student #	Section	Gain Score	SID	RCI	Gender	Ac. Status	Race	Intl.?	Hisp.?	College
6525233064	Fall A	5	2.33	2.05	M	First-year	Asian	N	N	Eng.
883434	Spring C	5	2.33	2.05	M	First-year	Asian	Y	N	Undeclared
740121	Spring C	3	1.40	1.23	F	First-year	White	N	N	Sci.
788163	Spring B	3	1.40	1.23	F	First-year	White	N	N	Mgmt.
801434	Spring B	3	1.40	1.23	F	First-year	White	N	N	HHS
Lowest Performances										
Student #	Section	Gain Score	SID	RCI	Gender	Ac. Status	Race	Intl.?	Hisp.?	College
5816433950	Fall A	-4	<i>-1.86</i>	<i>-1.64</i>	F	Third-year	White	Y	N	HHS
520314	Spring B	-4	<i>-1.86</i>	<i>-1.64</i>	F	First-year	White	N	N	HHS
553758	Spring C	-4	<i>-1.86</i>	<i>-1.64</i>	F	Third-year	N/A	N	Y	Ag.
471955	Spring A	-3	-1.40	-1.23	F	First-year	Asian	N	N	Sci.
250841	Spring C	-3	-1.40	-1.23	M	First-year	Asian	N	N	Eng.

Note: Individual change indices that are significant at the 0.05 level are bolded. By convention, SID and RCI values that exceed 1.96 (the critical value corresponding to 95% significance for normal distributions) are considered significant. Change indices that are significant at the 0.10 level but not at the 0.05 level are italicized (these values exceed 1.64, the critical value for 90% significance, but fall below 1.96). All of the gain scores listed exceed the IQR (2), so, in terms of that criterion, every score above is significant.

Course Document Textual Analysis Results

Textual analysis took the form of two successive rounds of descriptive coding conducted in accordance with the guidance in Saldaña (2016). The text of course syllabi and major assignment sheets were assigned to 21 descriptive nodes on a sentence-by-sentence basis (except for boilerplate text mandated by program-, department-, college, or university-level authorities, which were identified as “block” instances, with each “block” separated by headings). Lists of readings (provided on course calendars) and scoring rubrics (provided on major project assignment sheets) were analyzed for the same thematic nodes as the course document texts more broadly. However, these portions of the documents were considered separately. For more information about the coding themes chosen for this analysis, see Chapter 3.

Before the initial coding began, the general features of participating course curricula were recorded from course syllabi. Of the five sections that participated in the extra credit scheme, three were ENGL 106 (First-year Composition) sections, while two were ENGL 108 section (Accelerated First-Year composition). A similar 3/2 split existed in terms of syllabus approaches: three participating sections used Digital Rhetorics approaches, while two used Academic Rhetorics approaches. These two approaches are the only approaches approved for online ICaP courses. It is perhaps not surprising that every instructor used one of these two approaches, given that every course section included at least some online instruction. The most common course modality was a synchronous, fully remote experience with a hybrid structure. In these courses, students and instructors met online throughout the semester. Each week, one course meeting included the entire class, while the other meetings included smaller student groupings (these were the aforementioned hybrid courses). Other course modalities included a non-hybrid, synchronous, fully remote experience (i.e., the same as the one just described, except that every course meeting included the entire class) and a version of the hybrid course in which the small group meetings (but not the whole-class meeting) occurred face to face in classrooms on campus. While the major projects in each course differed, (both in terms of number and composition), the three courses employing the Digital Rhetorics syllabus approach offered very similar assignment sequences. Each of these courses offered four major projects: a professional email assignment, a digital interface analysis essay, a research unit consisting of an annotated bibliography and a “mapping the problem” essay, and either an infographic (2 sections) or research poster (1 section). The sections employing the Academic Rhetorics approach offered a more diverse

selection of assignments that included scholarly article analyses, TED-style oral presentations, critical reviews of media, and even podcasts. In addition to the major assignments just described, each course concluded with a portfolio project that required students to reflect on past course work. This is a requirement that ICaP mandates for all ENGL 106 and 108 courses. Additional information regarding each course's curriculum is presented in Table 11.

Table 11. Textual Analysis Summary Information

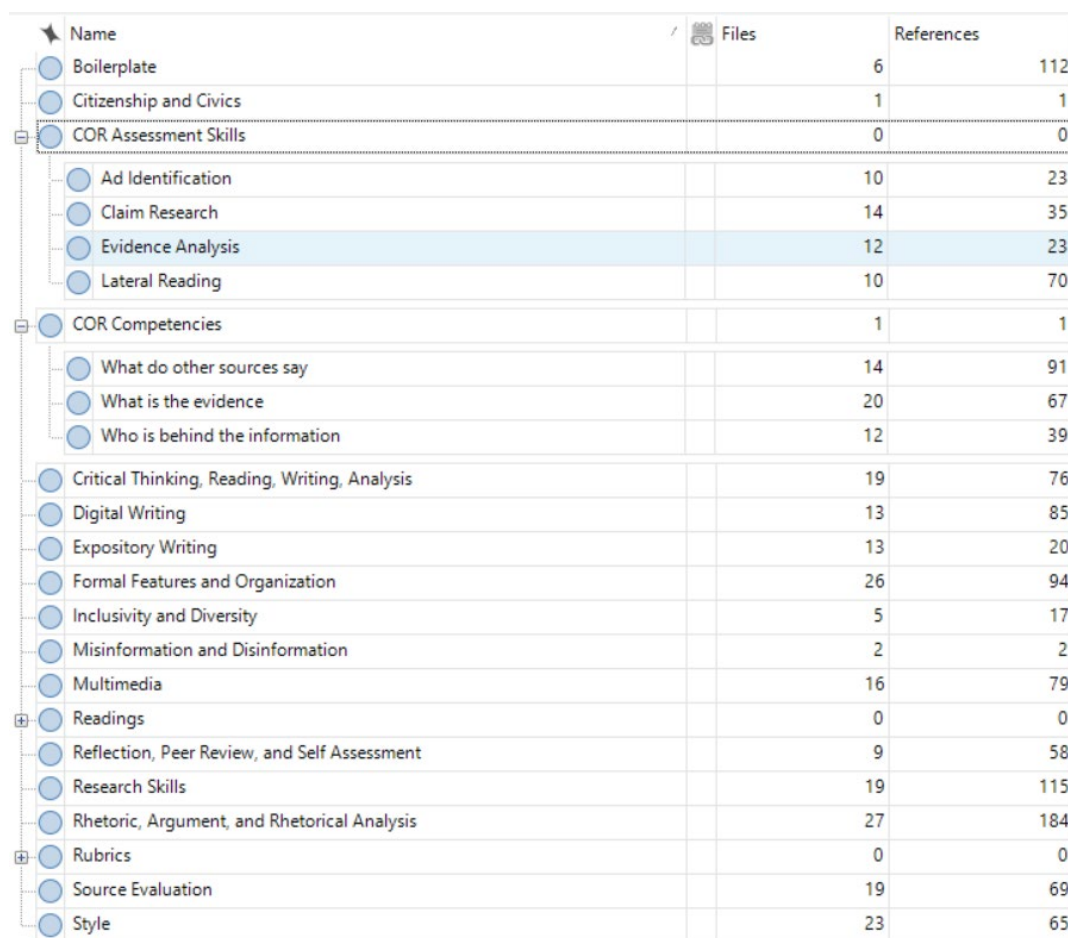
Section	Course	Style/ Modality	Syllabus Approach	# Major Projects	Project 1	Project 2	Project 3	Project 4	Project 5	Other Graded Assignments	# Readings	Textbook
Fall A	ENGL 108	Synch. Online (Hybrid)	Academic Rhetorics	3	Scholarly Article Analysis	Rschd. Argmnt.	TED Talk	[N/A]	[N/A]	Discussion board posts, portfolio	36	<i>Norton Field Guide to Writing with Handbook, (5th ed.)</i> Bullock & Weinberg
Spring A	ENGL 106	Synch. Online (Hybrid)	Digital Rhetorics	4	Prof. Email	Digital Interface Analysis	Ann. Bib., “Mapping Problem” Essay	Research Poster	[N/A]	Short writing assts., Online quizzes, portfolio	43	<i>Writing Today (4th ed.)</i> Johnson-Sheehan & Paine
Spring B	ENGL 106	Synch. Online (Hybrid)	Digital Rhetorics	4	Prof. Email	Digital Interface Analysis	Ann. Bib., “Mapping Problem” Essay	Infographic	[N/A]	Short writing assts, peer reviews, reflections, online quizzes, portfolio	50	<i>Writing Today (4th ed.)</i> Johnson-Sheehan & Paine
Spring C	ENGL 108	Synch. Online	Academic Rhetorics	5	Narrative/ Memoir	Review	Argmnt. Paper	Podcast	Rsch. Paper	Short writing assts (“How I Got Here” narrative, “Rave/slam,” “Rebuttal,”), quizzes, portfolio	24	<i>Writing Today (4th ed.)</i> Johnson-Sheehan & Paine
Spring D	ENGL 106	Mixed In-person/ Online (Hybrid)	Digital Rhetorics	4	Prof. Email	Digital Interface Analysis	Ann. Bib., “Mapping Problem” Essay	Infographic	[N/A]	Short writing assts, peer reviews, SOPs, reflections, online quizzes, portfolio	35	<i>Writing Today (4th ed.)</i> Johnson-Sheehan & Paine

Note: To preserve space, the ICaP-required portfolio assignment (offered across all courses) is listed under “Other Graded Assmnts” rather than in its own “Major Project” column.

Coding Results

First-round Coding

The first round of coding assigned descriptive nodes to the text of key course documents. For a complete list of categories used in the first round of coding, consult “Curricular Content Analysis” in Chapter 3. An overview of the results of the first round of coding is provided in Figure 4.



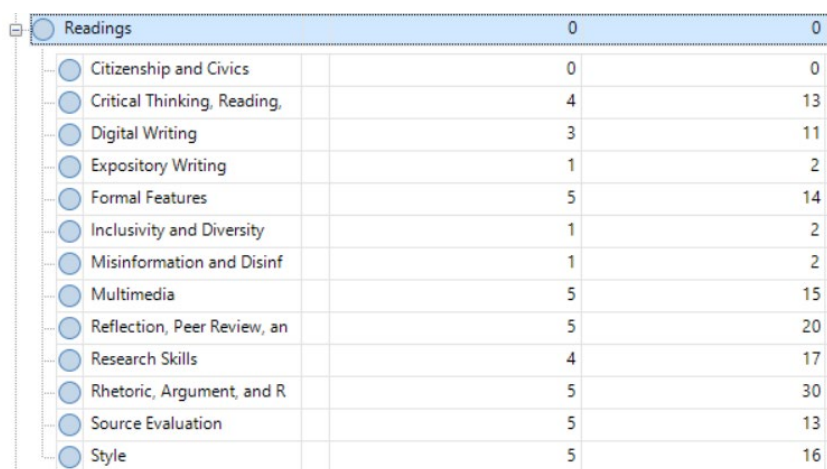
Name	Files	References
Boilerplate	6	112
Citizenship and Civics	1	1
COR Assessment Skills	0	0
Ad Identification	10	23
Claim Research	14	35
Evidence Analysis	12	23
Lateral Reading	10	70
COR Competencies	1	1
What do other sources say	14	91
What is the evidence	20	67
Who is behind the information	12	39
Critical Thinking, Reading, Writing, Analysis	19	76
Digital Writing	13	85
Expository Writing	13	20
Formal Features and Organization	26	94
Inclusivity and Diversity	5	17
Misinformation and Disinformation	2	2
Multimedia	16	79
Readings	0	0
Reflection, Peer Review, and Self Assessment	9	58
Research Skills	19	115
Rhetoric, Argument, and Rhetorical Analysis	27	184
Rubrics	0	0
Source Evaluation	19	69
Style	23	65

Figure 4. First-Round Coding Summary Information (Screenshot)

The most common descriptor assigned during the first round of coding was “Rhetoric, Argument, and Rhetorical Analysis.” This code, which was referenced 184 times, appeared at

least once in all 27 course documents included in the analysis, though (as is noted in the next section) this may have been due in part to the overly broad definition assigned prior to coding. When all COR Competency and COR Assessment Skill sub-codes were considered together, COR Competencies became the single most common descriptor (202 references, 20 documents).

Some portions of course documents were dedicated to listing required readings (in the case of every participating section, this occurred in a calendar at the end of the course syllabus). The notion of rhetoric/argument appeared most frequently in course reading lists (30 appearances across every participating course’s syllabus), followed by reflection, peer review, and self-assessment (20 appearances across every syllabus) and research skills (17 appearances; 4 syllabi). A summary of the reading list coding results for the first round of coding is provided in Figure 5.



Readings	0	0
Citizenship and Civics	0	0
Critical Thinking, Reading,	4	13
Digital Writing	3	11
Expository Writing	1	2
Formal Features	5	14
Inclusivity and Diversity	1	2
Misinformation and Disinf	1	2
Multimedia	5	15
Reflection, Peer Review, an	5	20
Research Skills	4	17
Rhetoric, Argument, and R	5	30
Source Evaluation	5	13
Style	5	16

Figure 5. First-Round Coding Summary Information, Readings (Screenshot)

Only two courses—Fall A and Spring A—included analytic rubrics on their major project assignment sheets. Courses that did not include analytic rubrics on their assignment sheets may have used a holistic scoring system for major assignments or may have provided students with a rubric via some other means (e.g., by using features built into online learning management systems). Unfortunately, because this study only required instructors to submit course documents, and not to grant the researchers full access to their courses, any rubrics not listed on assignment sheets are inaccessible.

When rubrics appeared in course documents, only the highest-scoring criteria in each scoring category were coded (for a lengthier discussion of how rubrics were coded, consult Chapter 3). The codes that appeared most frequently in assignment sheets' scoring rubrics were formal features/organization (35 appearances), rhetoric/argument (30 appearances), and style (28 appearances). However, because not all instructors included rubrics on their assignment sheets, these results should not be taken as indicative of any trends that would hold across ICaP instructors in general. A summary of the rubric coding results for the first round of coding is provided in Figure 6. Note that the number in the center column refers to the number of documents the code appears in while the number in the right column refers to the total number of codes.

Rubrics			
Rubrics		0	0
Citizenship and Civics		0	0
Critical Thinking, Reading,		5	12
Digital Writing		0	0
Expository Writing		2	2
Formal Features and Organi		8	35
Inclusivity and Diversity		0	0
Misinformation and Disinfor		0	0
Multimedia		2	7
Reflection, Peer Review, and		4	8
Research Skills		6	20
Rhetoric, Argument, and Rh		6	30
Source Evaluation		4	9
Style		8	28

Figure 6. First-Round Coding Summary Information, Scoring Rubrics (Screenshot).

Refining Codes

The ad-hoc process of applying codes to course documents during the first round of coding revealed a variety of problems with the coding scheme developed prior to analysis. These problems were recorded as the coding process proceeded, and the final list of problems was used to guide the development of the second set of codes. A summary of the kinds of problems and the changes made to correct them follows:

- The set of descriptive categories used for the first round of coding did not anticipate every theme that appeared in course documents. For example, the theme of writing as process occurred frequently in instructors' instructions for drafting and revising major course projects, but no code encompassed these references, so they needed to be assigned

to categories whose definitions only partially or tenuously connected to the stages of the writing process. Many references to the revision process were categorized under “Reflection, Peer Review, and Self-Assessment” because references to concepts like, e.g., revision included some indication that students would need to reflect on the quality of their own writing. By contrast, references to proofreading were typically assigned the “Style” code, whose definition included a focus on sentence-level writing concerns. For this reason, a dedicated “Process” code was included in the second round of analysis, with sub-codes for various stages of the writing process (like invention, drafting, revision, and so forth).

- Other codes were so broad that they encompassed a variety of writing tasks that did not bear a strong practical resemblance to each other. For example, the code “rhetoric” originally encompassed not only tasks like rhetorical analysis and references to various rhetorical appeals, but also the general concepts of argument and persuasion, which often feature prominently in lessons that teach fundamental rhetorical concepts to first-year writing students. However, the latter concepts appeared in course documents more frequently than anticipated, and they were used in unanticipated ways. One frequent occurrence was for course documents to present argument not as a persuasive task, but instead as a process by which students could form their own judgments or synthesize new ideas. One assignment sheet, for instance, asked students to analyze a series of sources on a particular topic, then “make an argument for what [they] see as being the most important points of contention, agreement, or misunderstanding, directing ... readers to a new way forward for this conversation.” For this reason, the second round of coding included a new, separate code for the concept of argument.
- Still other codes were too narrow. These codes’ original definitions did not encompass concepts or tasks that invoked overlapping competencies. For example, the “multimedia” code originally encompassed only references to the creation of explicitly non-text media: graphics, podcasts, posters, TED Talk-style presentations, and so on. However, many course documents also included references to the notion of “design”—the process of making decisions about the form and function of multimedia documents—separate from references to various multimedia. One assignment sheet addressed instructors as follows: “You will also have to make deliberate, rhetorical choices about document design: what

colors do you plan on using? How will you visually represent complex data or concepts?”

The multimedia code also failed to account for the term “multimodality,” which some instructors used interchangeably with “multimedia.” For these reasons, during the second round of coding, the multimedia code was changed to “media, modality, and design,” thus encompassing three closely related concepts.

- Finally, some codes appeared to be redundant—they overlapped with other codes that were more descriptive. For example, the “source evaluation” code—perhaps, in retrospect, not unsurprisingly—very frequently applied to portions of documents that also referenced the core COR competencies or the skills measured by the COR assessment. Because the latter sets of codes appeared to describe the same sets of phenomena as the source evaluation code, but with greater nuance, the source evaluation code was omitted from the second round of coding.

A complete list of changes is provided in Table 12.

Table 12. Problems Identified During First-Round Coding

Round One Code	Problems	Changes
Rhetoric, Argument, and Rhetorical Analysis	“Argument” theme did not function as predicted—often presented as process for analysis/synthesis rather than rhetorical task.	New code created: “Argument and Persuasion” encompassing both analytical/synthetic meaning as well as traditional persuasive meaning. General “rhetoric” code restricted to rhetorical analysis & references to appeals—i.e., attempts to understand/conceptualize rhetoric rather than to engage in persuasion.
Rhetoric, Argument, and Rhetorical Analysis	Discussions of audience are central to students’ rhetorical awareness but were not explicitly included in initial “rhetoric” code.	New sub-code: “Audience,” encompassing all references to audience awareness as well as tasks like audience analysis.
Digital Writing	Did not include concepts that would allow discussions of digital interfaces to be coded with nuance, “digital” adjective poorly defined.	“Digital” defined as “pertaining to computers,” explicitly online spaces and concepts coded separately. “Digital writing” assigned two new sub-codes: - “Online Writing”—writing and reading in online contexts and/or for online audiences. - “Online Interfaces”—analysis/discussion of how web architecture impacts users’ experiences (also encompasses related concepts like UX, provided the central object/text is online).
Multimedia	Did not explicitly include the notion of “design” (as in “graphic design”)—the task of	“Multimedia” code renamed to “Media, Modality, and Design,” redefined in order to encompass design concerns.

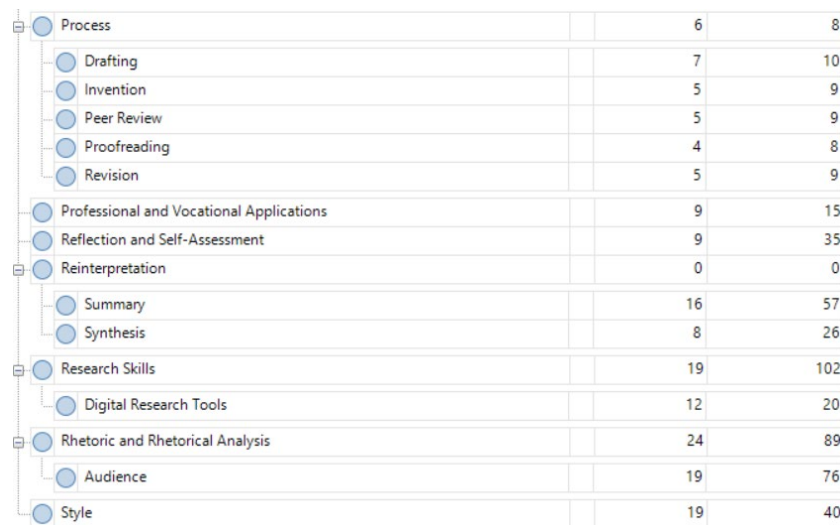
	making decisions about the form and functionality of non-textual compositions.	
Formal Features and Organization	Did not explicitly include references to genre expectations, which exert a strong influence over compositions/ formal features and organization but are not synonymous with these concerns.	New code created: “Genre,” encompassing all discussion of genre expectations and conventions.
Critical Thinking, Reading, Writing, Analysis	Did not explicitly include references to tasks that required students to reinterpret or produce new knowledge from existing information (summary and synthesis, e.g.) Critical thinking can play a key role in these tasks (particularly when students are asked to make judgments about various sources’ arguments) but is not a synonymous concept.	New code created: “Reinterpretation.” Two sub-codes assigned to “Reinterpretation:” - “Summary”—presenting existing information in new, simplified form. - “Synthesis”—using existing information to create one’s own ideas and arguments.
Source Evaluation	Very frequently applied to portions of course documents that were also described by some combination of COR competencies/skills codes, which, because they were more granular, allowed for greater detail and nuance.	“Source Evaluation” code removed from analysis.
Reflection, Peer Review, and Self-Assessment	Did not include explicit reference to various aspects of the writing process: namely, invention, drafting, revision, and proofreading. “Reflection ...” code often applied to these discussions. However, these discussions differed significantly from the concepts originally envisioned for the “Reflection ...” code (namely, the contemplation of the one’s own experiences during the writing process).	“Reflection ...” code renamed “Reflection and Self-Assessment.” New code created: “Process.” Five sub-codes assigned to “Process:” - “Invention” - “Drafting” - “Peer Review” - “Revision” - “Proofreading”
Boilerplate	No code existed that described writing-irrelevant directions to the student that did not take the form of boilerplate language provided by the school/department/program: where to turn in assignments, how to contact the instructor, and so on.	“Boilerplate” renamed to “Procedural Instructions.” Two sub-codes assigned to “Procedural Instructions:” - “Boilerplate”—standardized procedural language provided by the school, department, or program. - “Instructor-specific”—procedural directions whose language was not mandated by the school, department, or program.
Research Skills	Did not include explicit reference to students’ proficiency with various online research tools: library search engines, scholarly databases, and so on.	New sub-code assigned to “Research Skills:” - “Digital Research Tools”

Style	Original definition overlapped with new “Process” sub-code “Proofreading.”	“Style” code redefined to encompass matters of voice, tone, and sentence-level formatting conventions (e.g., the applications of APA or MLA conventions to citations), and not the correction of sentence-level mechanical errors.
COR Competencies COR Assessment Skills	Did not explicitly appear in list of rubric and reading list sub-codes.	COR Competencies and COR Assessment Skills added to list or rubric and reading list sub-codes.
Rubric sub-codes Reading list sub-codes	Grouping these within the same set of codes used for analysis of the other portions of course documents made visualization more difficult.	Separate sets of codes created for rubrics and reading lists (codes identical to “main” set).
N/A	No code existed that described the applications of writing or rhetorical skills to students’ professional/vocational goals (e.g., getting a job, advancing in a career, etc.).	New code created: “Professional and Vocational Applications.”

Second-round Coding

In accordance with the best practices outlined in Saldaña (2016), coding proceeded a second time using the revised list of codes. Summary information for the second round of coding appears in Figure 7.

Argument and Persuasion	25	81
Citizenship and Civics	3	3
COR Assessment Skills	0	0
Ad ID	12	40
Claim Research	14	24
Evidence Analysis	16	36
Lateral Reading	10	91
COR Competencies	0	0
What do other sources say	11	96
What is the evidence	17	45
Who is behind the information	15	48
Critical Thinking, Reading, Writing, Analysis	11	39
Digital Writing	12	34
Online Interfaces	9	39
Online Writing	14	40
Expository Writing	16	34
Formal Features and Organization	27	80
Genre	11	19
Inclusivity and Diversity	5	10
Media and Design	14	63
Misinformation and Disinformation	1	1
Procedural Instructions	0	0
Boilerplate	5	73
Instructor-specific	5	45



Process	6	8
Drafting	7	10
Invention	5	9
Peer Review	5	9
Proofreading	4	8
Revision	5	9
Professional and Vocational Applications	9	15
Reflection and Self-Assessment	9	35
Reinterpretation	0	0
Summary	16	57
Synthesis	8	26
Research Skills	19	102
Digital Research Tools	12	20
Rhetoric and Rhetorical Analysis	24	89
Audience	19	76
Style	19	40

Figure 7. Second-Round Coding Summary Information (Screenshot)

The most common descriptor assigned during the second round of coding was the generic “Research Skills” code (102 references across 19 course documents). Explicit references to digital research tools constituted a significant minority of these codes (20 references, 12 documents). When the COR Competency and COR Assessment Skill sub-codes were considered together, COR Assessment Skills became the most common code (191 total references, followed closely by COR Competencies (189 total references).

An automated linguistic analysis was used to determine linguistic similarities between the codes used during the second-round coding effort. This analysis—a built-in feature of the NVivo application—compares the number of words shared between each of the excerpts that particular codes are assigned to. NVivo automatically creates a large table in which each code is represented as a row and each unique word that appears in the text is assigned to a column (QSR International, n.d.). The cells in the table contain the number of times the column’s word appears in a string of text that the row’s code is assigned to. NVivo calculates the Pearson correlation coefficient for each pair of codes to determine which codes apply to passages that share many words in common. This process allows researchers to identify (for example) codes that may describe identical phenomena.

The results of this analysis demonstrated that most of the codes in the amended list were assigned to linguistically distinct passages. In other words, the various codes were usually assigned to portions of course documents that did not share many words in common. This, in

turn, suggests that the codes described distinct concepts (or, more accurately, concepts that instructors expressed with distinct language). However, there was one clear exception to this rule. The COR Competencies and COR Assessment Skills codes (henceforth referred to collectively as “COR codes”) appeared to be highly correlated. Very frequently, portions of course documents coded with one of the COR codes were also coded with one or more of the other COR codes. Specifically, Lateral Reading was correlated with “What do other sources say?”; Ad Identification was correlated with “Who is behind the information?”; and Evidence Analysis was correlated with “What is the evidence?” (which in turn shared a close relationship with the Research Skills code). Each of these three code pairs was applied to portions of course documents that were almost identical (the pairs’ Pearson coefficients equaled 0.99, 0.97, and 0.96, respectively). A cluster map illustrating the close linguistic relationships between the various COR codes is provided in Figure 8. Note that the proximity of nodes on the diagram signifies the linguistic similarity of text strings that codes were applied to, with closer nodes signifying more words in common. COR codes are highlighted in yellow.

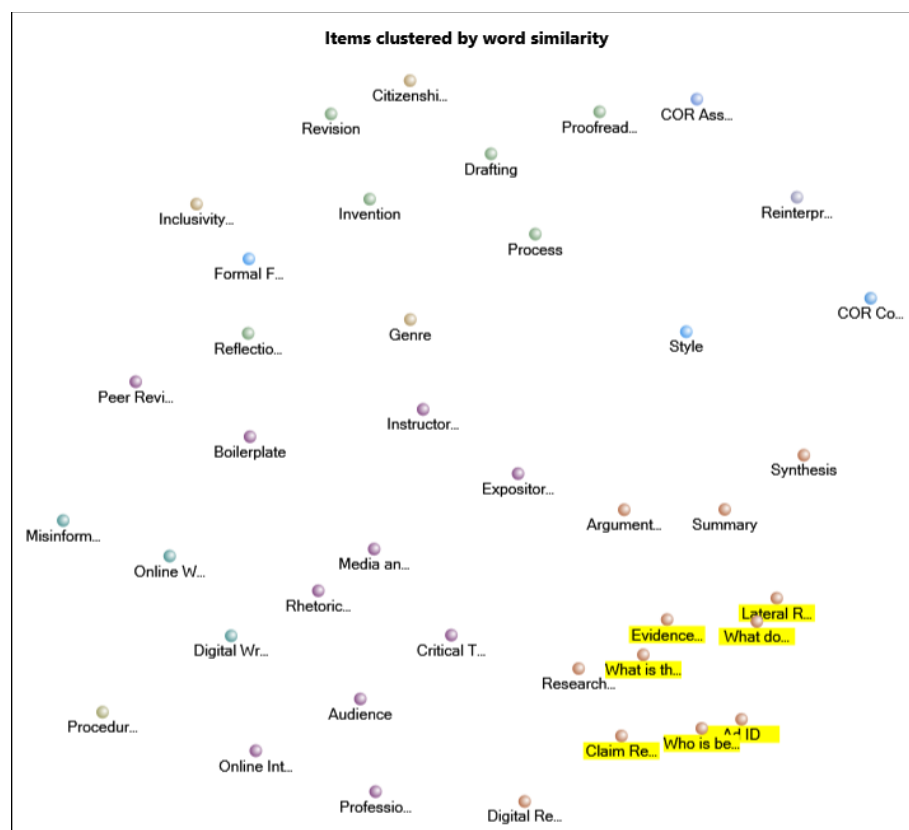


Figure 8. Cluster Map for Second-Round Coding Results.

The COR codes were not distributed equally across all course documents. In general, documents from the Spring A, B, and D sections (i.e., the sections using the Digital Rhetorics approach) tended to be assigned the COR codes most heavily. The Spring A annotated bibliography assignment sheet was the most COR-coded document overall: for each individual COR code, this assignment sheet was either the most-coded document or else tied with another document for most-coded status. Other heavily coded documents included the Spring B and D annotated bibliography assignment sheets and the Spring A, B, and D “Mapping the Problem” essay assignment sheets (each of these course sections assigned the annotated bibliography and the “Mapping the Problem” essay as part of the same unit). Documents from the Fall A and Spring C sections only appeared among the top five most-coded documents for each COR code once: the Fall A Scholarly Article Analysis assignment sheet is the fifth-most coded item for “What is the evidence?” However, all Fall A course documents and several Spring C documents (Argument Essay, Research Paper, Podcast, and syllabus) appeared among the sixth through tenth most-coded documents for many codes. When all COR codes were considered together, the most-coded documents were the Spring A, B, and D assignment sheets for the annotated bibliography and “Mapping the Problem” projects. Table 13 shows which documents were most frequently assigned each COR code.

When the second-round codes were applied to course reading lists, the Rhetoric code was most prevalent (15 references), followed by Research Skills (13 references). A summary of the reading list coding results for the second round of coding is provided in Figure 9.

Table 13. Course Documents by COR Codes Assigned Most Frequently

COR Code	Document Rankings									
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Ad ID	Ann. Bib.	Ann. Bib.	Ann. Bib.	Map. Prob.	Map. Prob.	Arg. Essay	Rsch. Paper	Podcast	Infographic	Syllabus
Section	Spring A	Spring D	Spring B	Spring B	Spring A	Spring C	Spring C	Spring C	Spring B	Spring A
# Codes	8	8	7	4	4	3	1	1	1	1
Lat. Rd	Ann. Bib.	Map. Prob.	Map. Prob.	Ann. Bib.	Map. Prob.	Ann. Bib.	Syllabus	Rsch. Paper	Rsch. Arg.	Syllabus
Section	Spring A	Spring A	Spring B	Spring B	Spring D	Spring D	Spring B	Spring C	Fall A	Spring D
# Codes	17	14	13	12	10	10	6	4	4	1
Claim Rsch	Ann. Bib.	Ann. Bib.	Syllabus	Syllabus	Ann. Bib.	Syllabus	Rsch. Paper	Syllabus	Infographic	Map. Prob.
Section	Spring A	Spring B	Spring A	Spring B	Spring D	Spring D	Spring C	Spring C	Spring B	Spring B
# Codes	4	3	3	2	2	2	1	1	1	1
Ev. An.	Ann. Bib.	Map. Prob.	Ann. Bib.	Map. Prob.	Ann. Bib.	Rsch. Paper	Arg. Essay	Syllabus	Infographic	TED Talk
Section	Spring A	Spring D	Spring D	Spring B	Spring B	Spring C	Spring C	Spring C	Spring B	Fall A
# Codes	4	4	4	3	3	2	2	2	2	2
Other Sources?	Ann. Bib.	Ann. Bib.	Map. Prob.	Map. Prob.	Ann. Bib.	Map. Prob.	Syllabus	Rsch. Paper	Rsch. Arg.	Sch. Art. An.
Section	Spring B	Spring A	Spring A	Spring B	Spring D	Spring D	Spring B	Spring C	Fall A	Fall A
# Codes	15	15	14	13	12	10	7	4	4	1
What Evidence?	Ann. Bib.	Ann. Bib.	Map. Prob.	Syllabus	Sch. Art. An.	Map. Prob.	Rsch. Paper	Ann. Bib.	Map. Prob.	Arg. Essay
Section	Spring A	Spring D	Spring D	Spring B	Fall A	Spring A	Spring C	Spring B	Spring B	Spring C
# Codes	4	4	4	3	3	3	3	3	3	2
Who's Behind?	Ann. Bib.	Ann. Bib.	Ann. Bib.	Map. Prob.	Map. Prob.	Arg. Essay	Map. Prob.	Rsch. Paper	Podcast	Syllabus
Section	Spring A	Spring D	Spring B	Spring B	Spring A	Spring C	Spring D	Spring C	Spring C	Spring C
# Codes	9	9	7	4	4	3	3	2	1	1

Argument and Persuasion	5	11
Citizenship and Civics	0	0
COR Assessment Skills	0	0
Ad ID	3	3
Claim Research	0	0
Evidence Analysis	4	5
Lateral Reading	2	2
COR Competencies	0	0
What do other source	2	2
What is the evidence	4	4
Who is behind the inf	3	3
Critical Thinking, Reading,	4	7
Digital Writing	3	4
Online Interfaces	2	4
Online Writing	2	3
Expository Writing	2	5
Formal Features and Orga	5	11
Genre	5	11
Inclusivity and Diversity	2	5
Media and Design	5	7
Misinformation and Disinf	1	2
Procedural Instructions	0	0
Boilerplate	1	10
Instructor-specific	1	6
Process	0	0
Drafting	5	7
Invention	3	3
Peer Review	3	5
Proofreading	1	2
Revision	4	7
Professional and Vocation	1	2
Reflection and Self-Assess	5	12
Reinterpretation	0	0
Summary	5	9
Synthesis	1	1
Research Skills	5	13
Digital Research Tools	2	3
Rhetoric and Rhetorical A	5	15
Audience	4	7
Style	5	12

Figure 9. Second-Round Coding Summary Information, Reading Lists (Screenshot)

When the second-round codes were applied to the scoring rubrics that appeared in Fall A and Spring A assignment sheets, Formal Features and Organization was once again the most prevalent code (37 references). When the Audience sub-code was considered alongside Rhetoric,

the combined grouping became the most prevalent code (23 references). A summary of the rubric coding results for the second round of coding is provided in Figure 10.

Argument and Persuasi	5	16
Citizenship and Civics	0	0
COR Assessment Skills	0	0
Ad ID	4	4
Claim Research	2	3
Evidence Analysis	3	4
Lateral Reading	5	9
COR Competencies	0	0
What do other sour	5	9
What is the evidenc	6	8
Who is behind the i	4	5
Critical Thinking, Readi	3	3
Digital Writing	0	0
Online Interfaces	0	0
Online Writing	0	0
Expository Writing	5	9
Formal Features and O	8	37
Genre	0	0
Inclusivity and Diversit	0	0
Media and Design	2	8
Misinformation and Di	0	0
Procedural Instructions	0	0
Boilerplate	1	10
Instructor-specific	1	6
Process	0	0
Drafting	1	1
Invention	1	1
Peer Review	2	2
Proofreading	8	9
Revision	0	0
Professional and Vocati	1	1
Reflection and Self-Ass	3	6
Reinterpretation	0	0
Summary	5	10
Synthesis	1	1
Research Skills	6	13
Digital Research To	0	0
Rhetoric and Rhetorica	8	15
Audience	4	8
Style	8	19

Figure 10. Second-Round Coding Summary Information, Scoring Rubrics (Screenshot)

While this chapter has presented bird's-eye trends in students' scores and courses' curricula, it has not examined any individual responses. The next chapter discusses how students earned their scores by engaging with the content of students' written responses in greater detail. It also places the students' responses in context by comparing them to the results of the original McGrew (2020) study. By doing these things, the chapter presents possibilities for why the birds-eye trends presented in the current chapter may have occurred.

CHAPTER 5: DISCUSSION

This chapter identifies the key findings of the results described in the previous chapter, discusses their significance, and comments on potential consequences for the field of writing studies. It first discusses the results of the initial (pretest) COR assessment, treating this information as indicative of “baseline” performance for students entering first-year composition courses at Purdue. This section outlines key differences between Purdue students’ pretest performance and the pretest performance of students in prior studies (namely, McGrew 2020) and considers the ramifications of these differences for the posttest results. The second section of the chapter describes student participants’ performance on the final (posttest) COR assessment, including students’ gain scores (i.e., the improvement or decline of their scores over the course of the semester). Additionally, this section discusses individual students with gain scores that significantly differed from the median, followed by a brief discussion of these students’ demographic similarities and differences. Both of this chapter’s first two sections include qualitative descriptions of students’ written responses and examples chosen to illustrate trends in how students arrived at particular scores.

In both of these first two sections, the responses of students who performed poorly are subjected to special focus. This is a product of the rubrics used to score the assessment. Because each item’s rubric specified strict scoring criteria, in order to achieve high scores, students needed to write responses that met precise sets of criteria. Thus, high-scoring students’ responses tended to be relatively uniform. By contrast, students who scored poorly had more varied responses. Here is an example: students taking the pretest Ad Identification item could have earned a low score by giving one of dozens of explanations for why a particular online article provided reliable information about climate change. They could also have argued that the source was not a reliable source of information but given a frivolous or incomplete justification. By contrast, high-scoring students needed to explain not only that the article was *not* a reliable source, but also that it was unreliable because it was sponsored by a company with a vested interest in favorable coverage. In sum, there were only a few ways for students to succeed on each item, but many ways for them to fail. Thus, closely analyzing the responses of failing students can offer clues as to why students struggled with particular COR component skills.

The third section of the chapter incorporates the results of the course document analyses into the discussion. This portion of the chapter identifies curricular features that may have contributed to students' improved performance on certain items (as well as their lack of improvement in other areas). Similarities and differences between instructors' course curricula are discussed in this section. Because student performance did not vary significantly from instructor to instructor, the section does not posit differences between instructors' curricula as potential contributors to student improvement/decline. However, the distinguishing qualities of instructors' curricula do feature in a conversation about how students who demonstrated large individual change indices may have arrived at their scores. Finally, the chapter concludes by summarizing the most important ramifications of the results, which will serve as the basis for additional discussion in Chapter 6.

Students' Initial Performance

While it may be tempting to immediately involve this study's pretest results in a broader discussion of student gain scores and COR growth, it is worth first considering pretest results in isolation for several reasons. Most importantly, this allows for a discussion of students' "baseline" COR ability—the competency with which they can perform the tasks of Ad Identification, Lateral Reading, Claim Research, and Evidence Analysis absent any deliberate college-level training in these skills. Because a large majority of the students in this study are first-year college students, gaining a sense of students' baseline ability could give clues as to the baseline performance of incoming college first years more broadly. This would be valuable knowledge for any age cohort. However, the first year of college is the subject of special scholarly interest. It is an important inflection point in students' educational careers—the point at which about one third of students (at the time of writing) opt to pursue education beyond what is typically deemed the minimum. It is also the subject of great practical significance: immense amounts of money and energy are spent every year determining which students have the qualifications necessary for admission to particular colleges and universities. If COR ever gains enough prominence in the educational community to feature in college curricula, universities will benefit from firm knowledge of where students' abilities tend to lie when they begin their postsecondary education. That said, it is important to exercise caution when drawing conclusions about the general population of students entering college from any single study, including this

one. First-year Purdue students are not necessarily representative of all first-year students across the country, and, in any case, the samples used in this study are too small to be representative.

Another reason for examining pretest results in isolation is that this affords an opportunity to compare students in Purdue's first-year writing classrooms to students who featured in prior studies of COR, including the recent work of McGrew (2020). This, in turn, allows for a richer discussion of how and why Purdue students' performances differed from that of students in past studies. Finally, more data is available for the pretest than for the posttest, as some students (particularly during the fall semester) completed the former and not the latter. Thus, there is an opportunity to make claims about student performance on the pretest (and "baseline" student performance more generally) with somewhat greater confidence than will be possible for the posttest.

One of the clearest trends that can be gleaned from the pretest data is the simple recognition the majority of participating students tended to score poorly on the initial COR assessment. The median score for the entire pretest was a 3 out of a maximum of 9 (for the posttest, the median score improved to 4). However, a closer examination of the pretest results reveals that students struggled with some items much more frequently than others. Of the 97 students who completed the entire pre-test, the overwhelming majority (76 students, or 78%) earned a score of 0 on the Ad Identification item. A similarly high number scored zero on the Lateral Reading item (75 students; 77%). However, scores on the Claim Research and Evidence Analysis items were better: only 13 (13%) and 19 (19.5%) of respondents scored zero on these items, respectively. As a result, median scores on the latter two items increased to 2 (for Claim Research) and 1 (for Evidence Analysis). In fact, a large plurality of students who completed the entire pretest (46 students; 48%) earned a score of zero on the first two items, a 2 on the Claim Research item, and then either a 1 or a 2 on the Evidence Analysis item, making these two score configurations nearly as common as all others combined.

Item-level Trends in Written Responses

Ad Identification

Students' written responses to the Ad Identification and Lateral Reading items indicate several reasons why they may have struggled. Of the 76 students who completed the entire

pretest and earned a zero on the Ad Identification item, all but two (97%) earned their score by arguing that Article B, the sponsored article, represented a more reliable source than a non-sponsored alternative. Among these students, 64 (84%) identified the content of either or both articles as a factor in their decision, while 40 (52%) identified the style, tone, or voice of either or both articles as a factor. Students who earned a zero on the Ad Identification item tended to receive the graphic in the sponsored ad positively. Of these students, 39 (51%) mentioned the graphic as a factor in their decision; none of these students described the graphic as something that detracted from the sponsored article's credibility. By contrast, students who earned a zero on this item tended to view the visuals in the non-sponsored article negatively. The image of Uncle Sam clutching a wrench may have been a factor in the semi-frequent complaint that Article A had a propagandistic tone that diminished its credibility (only about 21% of students who mentioned style or tone as a key factor in their decision-making used "propaganda" or a related term in their response, but others invoked the notions of jingoism and patriotism to make similar points). One typical zero-earning student wrote, for instance, "Article B [is more reliable] because it does not look like propaganda made in the 1900s. Also, the use of the pie chart makes it more reliant on statistics and science." Both graphics are provided in Figure 11.

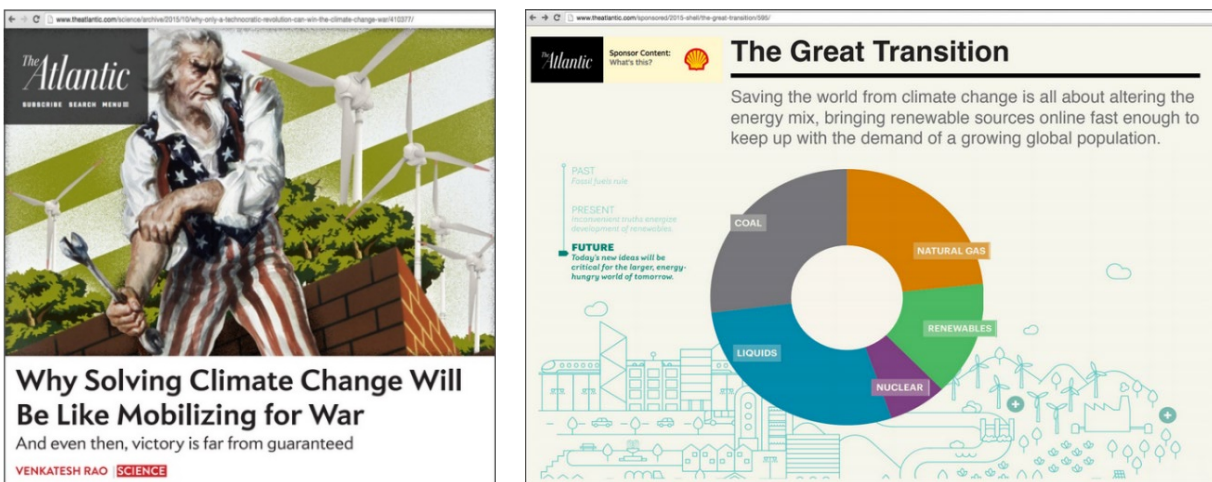


Figure 11. Ad identification item graphics (pretest). Note: "Article A" in this section refers to the article at left, while "Article B" refers to the article at right.

Other common complaints among students who earned zeroes included displeasure with the non-sponsored article's headline ("Why Solving Climate Change Will Be Like Mobilizing for War"), which some students derided as inflammatory. A small minority of students (5; 6.5%)

identified the fact that Article B was sponsored by Shell but either described this as a positive factor or rejected Article A for another reason. “the content [in Article B] is sponsored by shell, which would make me assume that the facts are true seeing that a company doesnt [*sic*] want to align itself with false info,” wrote one student.

Lateral Reading

As was the case for Ad Identification, students struggled with the Lateral Reading item during the pretest. Of the 75 students who completed the entire pretest and earned a zero on this item, a large majority (63 students; 84%) earned their score by arguing that the CO2Science.org site was a reliable source for information on global warming. In fact, the site is operated by the Center for the Study of Carbon Dioxide and Global Change, a front organization funded by Peabody Energy, one of the United States’ largest coal companies (Goldenberg & Bengtsson, 2016). Though the site presents itself as an unbiased authority on the topic of climate change, it disputes the scientific consensus on the anthropogenic origins of the phenomenon and argues that increased CO₂ levels in the atmosphere provide a number of benefits, including enhanced agricultural yields (Idso & Idso, n.d.). A picture of the front page of CO2Science.org is provided in Figure 12.

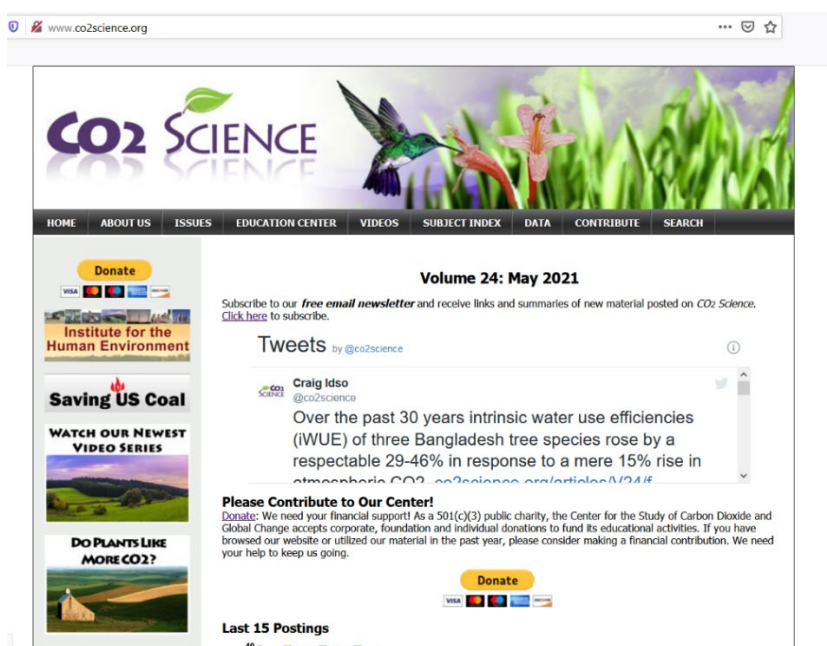


Figure 12. Lateral reading starting site (pretest).

Of the students who earned a zero on this item, a slim majority (42 students; 56%) included no sources in their long-form answer, perhaps signaling that they either misinterpreted the item's instructions or else lacked the motivation to document their work. 43 students (57%) justified their assessment of the site's reliability with a reference to its content, while 17 (23%) referenced the style of its prose or its general appearance. Specific aspects of the site that appear to have factored into students' decision-making include its .org domain name (25 students—33%—mentioned this), its references to academic, peer-reviewed articles (18 students; 24%), the scientific and academic credentials of its contributors (13 students; 17%), its informative graphics and/or videos (13 students; 17%), its references to quantitative data (11 students; 15%), and its donation funding model and/or its non-profit status (11 students; 15%). One typical student response was as follows:

I think it is credible. My first impressions from the website was [*sic*] that the domain ended with .org, which in my opinion is credible knowing that it is an actual organization. I also checked out the About Us page where they sited [*sic*] about wanting to differentiate between rhetoric and reality about the issue. The website has won many awards and the staff is composed of credible people with impressive degrees.

Responses like this one demonstrate a tendency for students to avoid the work of lateral reading even when presented with the suggestion that doing so may help them find a helpful answer—the text presented alongside the item tells students that they “can open a new tab and do an Internet search if that helps” (see Appendix A).

Claim Research

Students fared substantially better on the other two tasks featured on the pretest. Of the students who completed the entire pretest, only 14 (14%) earned a zero on the Claim Research item. The majority of those who did (9 students; 64%) provided one or more sources in their response, suggesting either that students understood the directions for this question better than they did on the Lateral Reading portion of the pretest or else were somehow more motivated to describe their work on this item. Despite this, a majority of zero-earning students provided either no explanation or an irrelevant explanation for how their sources supported their conclusions (10; 71%). Still others provided strongly partisan sources, like the article *Liberal Icon Cesar*

Chavez Opposed Illegal Immigration from Godfatherpolitics.com, an outspoken conservative blog.

Higher-scoring students had answers that avoided biased sources and provided some sort of reasonable justification for those sources' validity. A majority of students who completed the pretest (50 students; 52%) received a score of 2 on this item. Of these students, a majority (32; 64%) referenced at least one source from a reputable news agency. A minority referenced one sources from government/government-funded agencies (13 students; 26%) or academic sources (5 students; 10%). Similarly, 6 students (12%) referenced at least one source that could arguably be construed as biased, like an article on *The National Review*, a conservative (albeit mainstream) publication, or the website of the UFW, Chavez's union. However, unlike responses that cited, e.g., the Godfatherpolitics.com article mentioned above, these 2-scoring responses tended to accompany thoughtful, accurate, and fact-based assessments of Chavez's stance, suggesting that students' judgments were better-informed. For example, one typical student justified their choice to use ABC news and Latinorebels.com, an independent online newspaper with an activist slant, via the following response: "The ABC news source is strong cause [*sic*] it draws information from many different sources and explains the whole picture. The same is true for the Latino rebels website, which also draws information from many different books and letters from Cesar's life." An examination of the Latinorebels source reveals that, despite its ideological slant, it does indeed draw from reputable primary sources: letters written by Chavez in the 1970s, for instance.

By far the most common reason that students earned a 2 on the Claim Research Item rather than a 3 was that their explanations for sources' reliability were incomplete or superficial. For instance, one student provided the tautological answer that "The source I used was from Duke University, which is a very reliable establishment." By contrast, students who earned scores of 3 (32; 33%) provided not only reputable sources, but also more detailed and complete justifications for those sources' validity. One response that earned a 3, for instance, made explicit reference to not only the content of a reputable article, but also the relevance of its author's professional background.

The website I used is from UC Davis, which was taking a fairly objective position of the issue by just recounting the historical events that were detailed in the PBS Chavez

documentary. The biography seems fairly well sourced with the author having previous experience documenting unions and their history.

By referencing high-quality sources and offering reasonable justifications for those sources' usefulness (in this case, the author's pedigree and the diligent sourcing in the article), responses like this differentiated themselves from those that earned a 2.

Evidence Analysis

As was the case with the Claim Research item, students appeared to find the Evidence Analysis item easier than the Ad Identification and Lateral Reading items. A screenshot of the social media post whose reliability students were asked to make a judgment about appears in Figure 13.

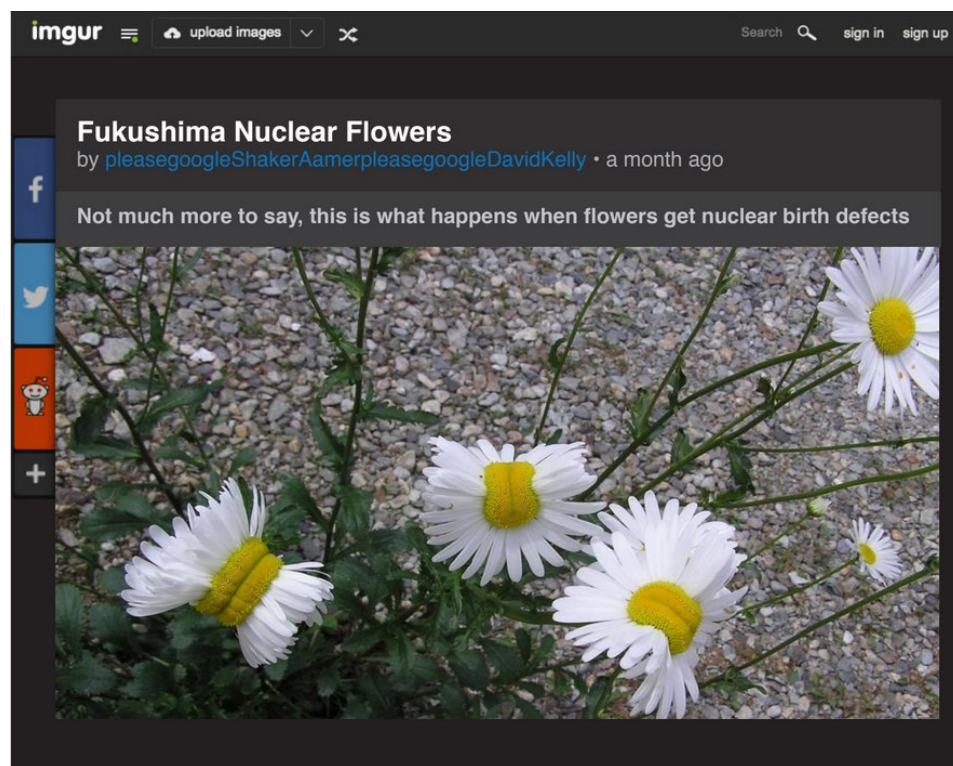


Figure 13. Evidence analysis social media post (pretest).

Because this item did not require students to perform any research tasks, but instead to merely make a binary judgment about a single picture, their responses tended to fall into just a few readily identifiable categories. The minority of students that scored a zero on this item (19

students out of 97 who finished the pretest; 20%) overwhelmingly tended to earn this score simply by making the wrong judgment about the picture: that it did indeed show evidence of radiation near Fukushima (16 students; 84%). However, eight students (42% of zero-earners) expressed hesitation or reluctance about the image even as they accepted the radiation claims. One student, for instance, wrote:

Although Imgur is not a reputable source, I believe this photo demonstrates the conditions near the Fukushima power plant. I know that nuclear exposure can cause genetic defects, so I am not surprised that flowers may have deformed. However, I also think that the photo does not fully represent the extent of the damage.

Students who scored higher than a zero were nearly evenly split between scores of 1 (36; 37% of total) and 2 (41; 42% of total). Students who scored 1 frequently offered legitimate complaints about the image without explicitly mentioning the source of the post or the photograph. Frequent complaints included the argument that the image lacked sufficient evidence for the radiation claims (20 students; 55% of one-scorers) and the argument that another explanation could be behind the flower's deformities (14; 39%). One student even argued that there could be another culprit for the flower's appearance via a lengthy, polished paragraph complete with references to a reputable external source. This would certainly have been a convincing argument in most real-world contexts, but due to the scoring rubric's strict criteria, this response did not earn full points. By contrast, all of the responses that earned a score of 2 were uniform in that they not only rejected the radiation explanation, but also questioned the source of the photograph and/or post. One response that earned a two was as follows:

This post, by itself, does not provide strong evidence about the conditions near the Fukushima Power Plant. Imgur is a website where anybody can post photos and there's no reason to believe that this picture wasn't altered in some way. There is also no way to verify that this picture was taken near the power plant. Even if the picture is real, it doesn't provide any sort of data and general information about the area.

Pre-test Results in Context

While first-year writing students at Purdue struggled with two COR component tasks, these students' median scores on the other two tasks are notably better than those provided by McGrew (2020). In McGrew's study, the sample of student participants produced median scores

of zero for all four items on the pretest. However, there are several aspects of McGrew's study that might account for this difference. Most obviously, McGrew's study involved 11th graders in a comprehensive public high school rather than a range of college students consisting mostly of first years but also containing a handful of second- and third-year students. The high school in McGrew's study also has a substantially different demographic profile than Purdue University (per McGrew, 2020, p. 4) and is located in a different part of the country. Additionally, the study took place in an Advanced Placement history classroom, rather than an English classroom. If any entrance requirements existed for this course (McGrew lists none), they would ostensibly have been different than the requirements for ENGL 106 and 108, ensuring students who took the pretest differed not only in terms of age but also potentially in terms of academic profile.

Any (or all) of these factors could be responsible for the difference in baseline pretest performance. Age seems likely to have played a role: all but one third-year student had a pretest score greater than the overall pretest median. However, as explained in the discussion of individual gain scores below, the presence of upper-level college students in this study's sample does not appear to have translated to superior performance overall (in fact, the opposite may be the case). Demographic factors seem less likely. Only one demographic trait in this study's sample appeared to significantly predict performance on the pretest: students who identified as Hispanic/Latino tended to score higher than their peers on the pretest (though they subsequently scored significantly lower than their peers in terms of gain scores). In any case, no plausible explanation for this feature of the data is forthcoming. It may simply be the case that, due to random chance, the small number of Hispanic/Latino students in the sample happened to be bright students who all faced unusually difficult end-of-semester schedules.

Students' Posttest Performance and Gain Scores

The posttest performance of students who participated in the study varied significantly by item. Performance increased significantly on the Ad Identification and Lateral Reading tasks but did not significantly change on the Claim Research and Evidence Analysis tasks. Most of the positive change in students' scores on the first two items appears to have resulted from improvement on the part of students who had previously earned a zero. On the posttest, 31 students—60% of those who completed the entire posttest—earned a zero on the Ad Identification item. Though this is still a majority of respondents, it is a (statistically significant)

decrease of roughly 18% relative to the pretest. Similarly, on the posttest version of the Lateral Reading item, 58% of students earned a score of zero; this is a decrease of 20% relative to the pretest. By contrast, students' posttest performance on the Claim Research and Evidence Analysis tasks was, in overall terms, worse than it was on the pretest (though, to reiterate, the change on these items was not statistically significant). Most of the negative performance on the posttest Claim Research item (8 of 15 students with negative gain scores; 53%) was due to students who had previously earned a 2 subsequently earning a 0. Students' responses suggested that the posttest Claim Research item may have been more confusing to them than the pretest version, which may have played a role in their lower overall performance (this is discussed at greater length below). On the Evidence Analysis item, no single set of scores explained the majority of the decline. Students whose scores decreased were split between those who decreased from 2 to 1, (7 of 16 students; 44%), those who decreased from 1 to 0 (5 students; 31%), and those who decreased from 2 to 0 (4 students; 25%).

These results stand in contrast to prior research, which found significant increases in student performance for every task except Ad Identification (McGrew 2020). Some inconsistency between this study and prior literature is to be expected, however, as this study did not ask teachers to adjust their curriculum or pedagogy in any way to support students' COR gain. By contrast, McGrew (2020) measured the efficacy of special curricula designed to teach precisely the skills measured by the assessment. Thus, it is not unreasonable to surmise that the superior performance of students in studies like McGrew's may be due in large part to deliberate instruction in COR component skills.

Item-level Trends in Written Responses

Ad Identification

While a large majority of students who completed both tests experienced no change in their performance on this item (35 of 45 students; 78%), of the students whose scores did change, 60% experienced a change of +2 (i.e., their score increased from a 0 on the pretest to a 2 on the posttest). 73% (11 students) experienced a positive change overall, while 27% (4 students) experienced a negative change. This is sufficient change for statistical significance, which provides evidence for some overall positive gain in students' Ad Identification skill.

Changes in student behavior were apparent at the level of individual responses as well. For example, students who earned a zero on the posttest version of this item differed from those who earned a zero on the pretest in terms of the reasons for their score. Only 17 of the 33 students (52%) earning zero on the posttest earned their score by incorrectly identifying Article A as more reliable—a 45% decline relative to the pretest. The rest either (correctly) identified Article B as more reliable or else equivocated between the two articles and earned zeroes by failing to mention the fact that Article A was sponsored content in their explanation. Images of Articles A and B are provided in Figure 14. As was the case with the pretest, content was a deciding factor in a majority of 0-earning responses (24 students; 73%) and graphics or visuals featured in a significant minority of responses (9 students; 27%). Style was not cited frequently (4 students; 12%). Some students who cited content as a major factor in their decision appear to have interpreted the prompt (“Is Article A or Article B a more reliable source for learning about impact of plastics on the environment? Explain.”) as an invitation to identify which article espoused a more negative attitude about plastics, and not to judge which was article a more reliable source of information about plastics’ environmental impact. One student wrote, for instance:

Article B is a more reliable source for learning about the impact of plastics on the environment because the article's content is directly covering that issue whereas Article A has to do with a plastic alternative. Both articles are from The New York Times so they probably have an equal amount of credibility, but Article B relates more to the topic that is being researched.

Some of this apparent confusion even extended to higher-scoring responses. After arguing that Article B was more reliable because Article A was a piece of sponsored content, one student who earned a two added, “Also A is mostly about farming and seeds and mentions plastics once.” Whether they reacted to the prompt with confusion or not, however, all responses that earned a two successfully identified that sponsored content posed the potential for bias. One response that illustrated how students could identify the problems with Article A even as they also listed less-relevant concerns was as follows:

Article B is a more reliable source. While Article A does contain a lot of statistics about bioplastics, they aren't very pertinent to learning about the impact of plastics on the environment. Article A is also sponsored by Ford, and as a piece of advertisement, it

shouldn't be used to glean useful and accurate information. Article B on the other hand, is a scientific study, and can be deemed as more trustworthy since they are both from the same news source, but one is sponsored.

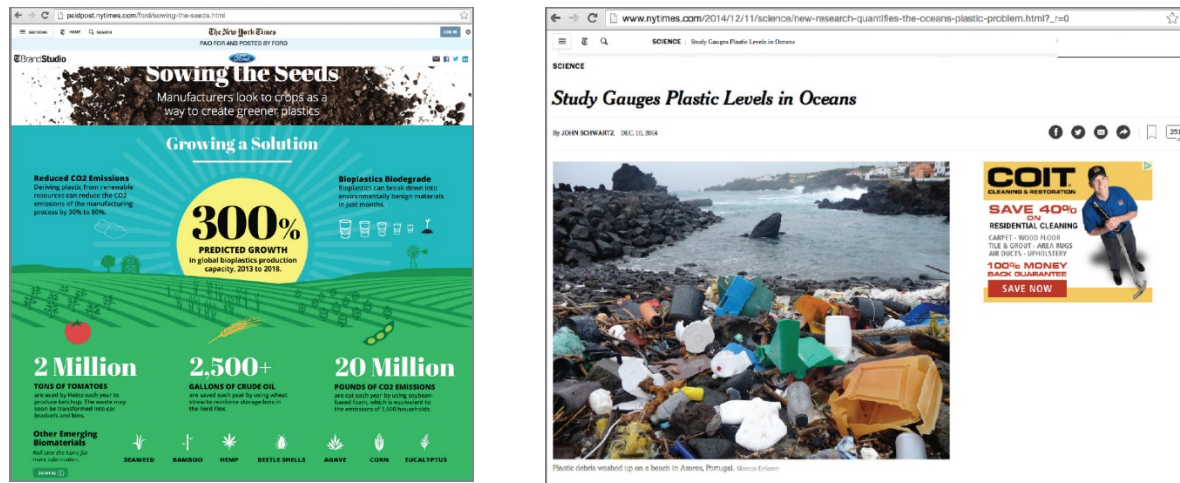


Figure 14. Ad identification item graphics (posttest). Note: “Article A” in this section refers to the article at left; “Article B” refers to the article at right.

Lateral Reading

As with Ad Identification, most students who completed both tests experienced no change in their performance on this item, though the majority in this case was 20% smaller (26 of 45 students; 58%). Of the students whose scores did change, 63% (12 students) experienced a change of +1. Most students with this gain score increased from 0 on the pretest to 1 on the posttest, rather than from 1 to 2 (though 3 students—25% of those who increased by 1—did increase from 1 to 2). 79% (15 students) experienced a positive change overall, while 21% (4 students) experienced a negative change. Though the average overall change was smaller than for the Ad Identification item (due to fewer 0 > 2 increases), these results were statistically significant, implying some gain in this COR component skill over the course of the semester.

Of the students who earned a zero on this item, a large majority (23 of 28 students; 82%) incorrectly judged Friends of Science.org to be a trustworthy source for information on climate change (an image of the website’s front page is provided in Figure 15). A larger majority of zero-earning respondents than on the pretest (23 students; 82%) failed to include sources in their written responses despite being prompted to do so. Though no explanation is readily apparent,

potential causes could include end-of-semester fatigue or a lack of motivation. The content of zero-earning responses mirrored the pretest: 13 students (46%) justified their assessment of the site's reliability with a reference to its content, while fewer (5 students; 18%) referenced the style of the site's prose or its general appearance. Similarly, the site's .org domain appears to have featured prominently in the explanations of students who earned zeroes (8 students—29%—referenced this aspect of the site). Another factor that appears to have led a handful of students to scores of zero was the scientific expertise of the site's contributors (4 students; 14%). A small number of students also referenced the fact that the site provides references to academic articles (3 students; 11%). It is also worth noting, however, that, unlike on the pretest, one student earned a zero via a response that simply cited the website's main viewpoint: "They don't [*sic*] believe in climate change." While it is true that rejecting climate change puts the site at odds with scientific consensus, the rubric requires a combination of evidence and explanation for scores of 1 and 2, so this response earned a 0.

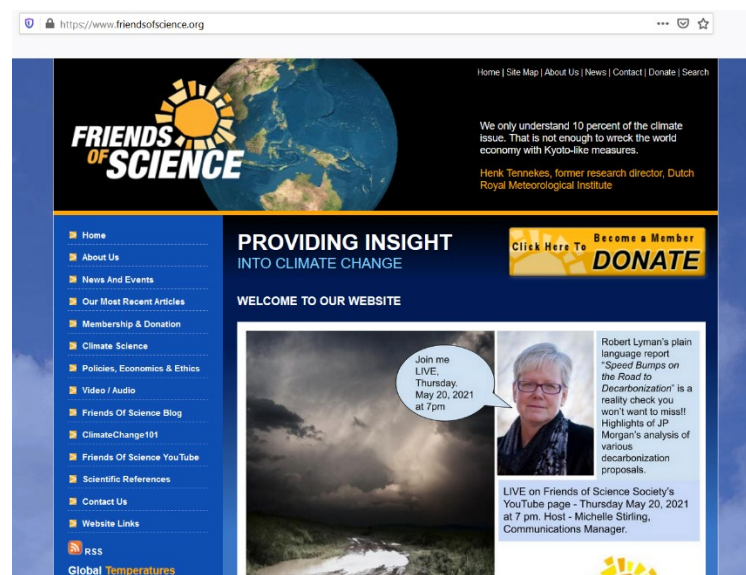


Figure 15. Lateral reading starting site (posttest).

The responses of students who earned a score of one, which were responsible for most of the positive gain on this item, revealed the ways that students improved on their pretest performance. All but one student who earned a one did so by satisfying the second set of qualifying criteria listed in the rubric for a score of one: "Student provides a complete

explanation that is supported by relevant evidence but does not say where the evidence is from.” In other words, these students rejected the site as a trustworthy source of information about climate change and gave an explanation that was well-supported with evidence but did not list their sources. One typical response was:

I do not think it is reliable because it goes to talk about how former scientists believe that global warming is due to just the sun and how they think the Kyoto protocol is a sham. I have studied this information in class so I know that around the world like 90% of scientists believe that global warming is caused by us.

This student questions the site’s reliability and gives specific false claims to justify this decision, but it does not provide specific sources. By contrast, a response that earned its author a score of two was as follows:

In the website it opposes the Kyoto Protocol, which states that industrialization is the reasoning behind global warming and these countries need to go green. The website doesn't fully acknowledges [*sic*] the existence of climate change. It also doesn't provide evidence for its argument.

Websites:

<https://friendsofscience.org/index.php?id=3>

https://unfccc.int/kyoto_protocol

It is unclear why most students who earned scores of one opted not to include sources in their responses—ostensibly an easy “next step” that would have earned them an additional point—despite explicit prompting to do so.

Claim Research

Student performance on the Claim Research and Evidence Analysis tasks decreased relative to the pretest. However, this change was not statistically significant, and the most common gain score on this item among students who completed the entire pretest and posttest was zero (21 students out of 45; 47%). Among students whose scores did change, -2 was the most common change (9 students out of 24; 38%), though no single gain score predominated. Most of these students achieved -2 gain scores by earning a 2 on the pretest and a 0 on the posttest; only one student changed from 3 to 1. The most common positive gain score was 2 (6

students out of 24; 25%). All of these students achieved their score by earning a 0 on the pretest and a 2 on the posttest.

Students' posttest responses differed from those on the pretest in several different ways. As might be expected in light of students' overall decline in performance, a larger proportion of the students who completed the entire posttest earned a zero on this item than on the pretest (13 of 52; 25%). Moreover, even zero-earning students who completed both the entire pretest and also the entire posttest—ostensibly the most motivated students—frequently failed to provide sources in their answers despite being prompted to do so. Only 4 students (36% of zero-earners who completed both tests) did so. This stands in marked contrast to the pretest, on which a majority of zero-earning students provided sources for their arguments. Students who completed both tests also provided less thoughtful, detailed answers than on the pretest version of this item. Every student who earned a zero on the posttest Claim Research item gave a tautological justification of their source's validity ("This is a strong source because it relates to Margaret Sanger," e.g.) or else provided no justification at all ("I didn't feel the need to look farther than my search screen," wrote one student). Reasons for the decreased quality of zero-earning students' written responses might include end-of-semester fatigue or a lack of motivation for completing the posttest beyond a desire for last-minute extra credit points.

It is also worth noting that, more so than for the other items on either the pretest or posttest, students' posttest Claim Research responses occasionally contained evidence of confusion. Notably, seven students' responses (16% of those who complete both tests in their entirety) appear to explore Margaret Sanger's stance on eugenics, rather than euthanasia (the prompt read "Do you believe Margaret Sanger [the founder of Planned Parenthood] supported euthanasia? Explain using evidence from the websites you consulted."). These students may have been casually aware of the controversy surrounding Sanger's support for eugenics and may have unintentionally substituted one concept with another while reading the prompt. "[Sanger] was indeed in support of euthanasia as the time [*sic*] magazine reported that 'In a 1921 article, she wrote that 'the most urgent problem today is how to limit and discourage the over-fertility of the mentally and physically defective.'", wrote one student, seemingly confusing the meaning of "euthanasia" for that of "eugenics." Other students who did not make this mistake nevertheless signaled trepidation at the similarity of these two terms. One student who earned a score of three wrote, "I don't think she supported euthanasia. She was a supporter of the eugenics movement,

but none of the sources I read explicitly stated that she was in favor of euthanasia.” Another suggested that the test itself was in error: “I couldn’t find a single article discussing both Margaret Sanger and Euthanasia ... I assume there was simply a typo and that the question is meant to be asking about eugenics.” These students demonstrated that they understood the differences between eugenics and euthanasia but still noted the potential for confusion.

To clarify: the original designers of the COR assessments do not appear to have made a typo. The official guidance for this item (Stanford History Education Group, n.d.c) makes multiple explicit references to euthanasia, including a screenshot of search engine results that include references to euthanasia alongside references to eugenics. This screenshot is provided in Figure 16.

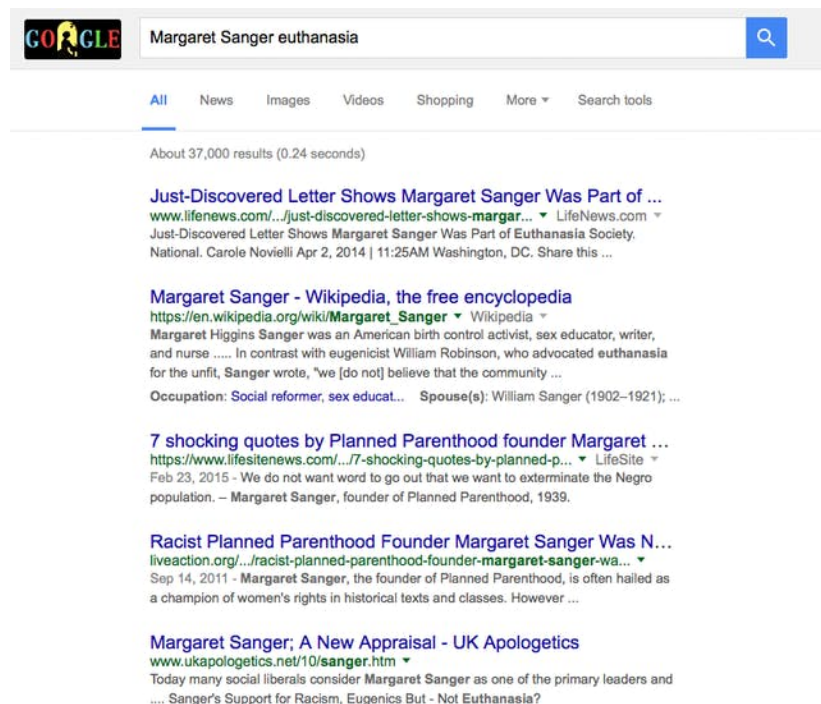


Figure 16. Claim research reference image provided by SHEG.

While a number of high- and low-scoring students’ responses indicated confusion, other students’ responses hinted at frustration or offense. One student, for instance, outright refused to answer the question. “I don’t feel comfortable answering this question,” wrote this student (the student’s response was omitted from analyses of this item). Another gave a single-word response (“No.”) and, when prompted to justify their answer, wrote “Idk” [“I don’t know”]. A final

student provided a similarly laconic response to signal the opposite conclusion: “Yes.” The justification the student provided for their answer was merely “Past knowledge.”

It would be unwise to draw firm conclusions from these isolated responses. However, one potential explanation could be that a small number of students in Purdue’s first-year writing courses have an emotional investment in this particular controversy. In other words, the issues of euthanasia, eugenics, and/or abortion may have provoked greater emotional responses in students than other controversial issues. Unfortunately, literature offers minimal guidance on this matter. While there is a surprising dearth of research into the attitudes of American undergraduates vis a vis abortion during the past decade, one recent European study finds that undergraduate students can vary substantially in their attitudes regarding abortion due to factors like religion, academic major, and sexual orientation (Alvargonzález, 2017, p. 522-523). However, the fact that the three students who provided the responses quoted above also responded to the pretest Claim Research item (which dealt with the controversial issue of illegal immigration) without giving similarly frustrated, dismissive, or offended responses is one point of evidence supporting the notion that eugenics, euthanasia, and/or abortion strike some students as especially objectionable topics. If this is sufficiently true to affect students’ results at scale, this item may need to be modified to ensure accurate measurement of Claim Research ability. Future COR research should explore whether the emotional sensitivity that some students have for controversial issues like abortion, euthanasia, and eugenics affects their ability to perform brief research tasks like the Claim Research item in this study.

Evidence Analysis

As with the posttest version of the Claim Research item, students’ responses on the posttest Evidence Analysis item were lower than those on the pretest. Again, however, this change was not statistically significant, and the most common gain score on this item among students who completed the entire pretest and posttest was zero (16 students out of 45; 36%). While zero was the most common gain score, it accounts for a smaller portion of responses here than for any other item. Of the students who did not earn a gain score of zero, the most common gain score was -1 (12 of 29; 41%), followed by +1 (10 students; 34%). Most students who achieved a gain score of -1 (7 of 12 students; 58%) did so by scoring a 2 on the pretest and a 1 on the posttest. Because the decisive factor for scoring a 2 on this item’s rubric is an explanation

that explicitly “questions the source of the post (e.g., we don’t know anything about the author of the post) and/or the source of the photograph (e.g., we don’t know where the photo was taken),” these students successfully questioned the source of the post or photograph on their pretest response but merely offered a more general rejection on their posttest response.

Students who completed both tests and scored zero on this item (13 of 45; 29%) generally did so by incorrectly judging the social media post to provide strong evidence about conditions in Syria (10 of the 13 students, or 77%, did this). Unlike on the pretest, however, only two students (15% of zero-earners—a decrease of 27% from the pretest) expressed reluctance or hesitation when making an incorrect assessment of the image’s trustworthiness. One of these students wrote: “It provides conditions in terms of kids losing their parents due the war that is happening around them. However, I think is [*sic*] exaggerated with every kid that has lost their parent sleeping on the streets.” While claims like this do not offer any clear clues about the motivations behind their authors’ judgments, one possible cause for the relative lack of qualified or hesitant responses is that students found the image more emotionally affecting than the equivalent pretest image (which showed a deformed flower). Students may have felt compelled to accept the basic premise of the image in order to demonstrate compassion, as the image (ostensibly) depicted a child experiencing intense grief. An image of the social media post used in the posttest Evidence Analysis item post is provided in Figure 17.



Figure 17. Evidence analysis social media post (posttest).

Of the students who completed both tests and earned a score of 1 on the posttest (13 of 45; 29%) tended to focus on the anecdotal quality of the post or the idea that one child's conditions do not necessarily illustrate the conditions of Syrian children more generally (7 of 13 one-earners, or 54%, did this in their response). One student who provided a typical response wrote,

No, this picture does not provide strong evidence about the conditions in Syria because it is a single picture with no other supporting evidence. I know from secondary research that these conditions actually do exist for children in Syria, but to prove this to someone one picture would not suffice.

A minority of one-earning students (3; 23%) mentioned the picture's emotional resonance even as they judged it unreliable (0 students mentioned emotion on their pretest responses). Only a single one-earning student posited alternative explanations for the situation depicted in the image (whereas nearly 40% of pretest respondents did).

These qualities of 1- and 0-earning students' responses may signal that the content of the posttest Evidence Analysis item was emotionally potent enough to exert a small effect on students' responses. Specifically, students may have been more accepting of the argument in the image due to feelings of pity or compassion. The inverse may also have been true: students may have been somewhat more unwilling to question the image's reliability, lest they appear callous. Of course, these explanations are by no means assured. Nevertheless, as was the case with the posttest Claim Research item, student responses on the posttest Evidence Analysis item point to an avenue for future research: exploring whether students' COR abilities are affected by the emotional content of the items used.

Response Trends by Grouping

Instructor-level Trends

Surprisingly, overall student performance did not vary significantly by instructor. The section-by-section gain scores were so consistent, in fact, that every section had identical median gain scores (0) for the Ad Identification and Lateral Reading tasks. Only in one case did the median gain score for two sections differ by more than 1 for a single item: for the Evidence Analysis task, students in the Spring D section had a median gain score of 0.5, while students in

the Spring A section had a median gain score of -1. Differences were slightly more pronounced when the entire test was scored as a whole. In this case, the section with the highest median gain score (Spring A; median = 1) differed from the section with the lowest median performance (Fall A; median = -1) by a value of 2. This difference, however, was not statistically significant, given the small sample sizes involved. Appropriately, though the most common (mode) gain score for the entire sample of students was 1, the median gain score was zero. Similarly, the correlation between a student's performance on the pretest and the same student's performance on the posttest was only very weakly positive.

Thus, by any reasonable accounting, the “average” influence of a single semester of ENGL 106/108 instruction on student COR ability was small. Moreover, these results suggest that teaching style and curriculum (or at least the particular teaching styles and curricula represented in this study) do not play a large role in determining whether a given section of ENGL 106/108 will produce COR gain or not. Instead, students tend to improve relative to pretest Ad Identification and Lateral Reading performance, and they tend not to improve relative to pretest Claim Research and Evidence Analysis performance, regardless of their particular teacher or curriculum. It is even possible that some factor external to ENGL 106/108 caused the improvement in Ad Identification and Lateral Reading performance, and that this was reflected in the section-by-section uniformity of students' posttest performance. However, because this is an exploratory study, this possibility can neither be confirmed nor rejected. The question of whether some general aspect of students' college experience or some specific aspect of attending Purdue increases COR ability must be consigned to future research.

Individual-level Trends

Despite a lack of significant difference at the level of course sections, student performance varied substantially at an individual level. A handful of students' performances differed from the median sufficiently enough to make random chance an unlikely explanation. These included two students—one in the Fall A course section, one in the Spring C course section—who improved on their pretest performance by five points, satisfying even the relatively strict criteria for significance that accompany the Reliable Change Index. Three students—one each in Fall A, Spring B, and Spring C—suffered a four-point decrease on their posttest score, which was significant insofar as it exceeded the interquartile range (the most generous criterion

used), though it would have also registered as a significant SID and RCI if a lower level of significance (like 0.10) were used. Given the lack of significant section-by-section differences, examining these students in greater detail may be one means to identify factors associated with COR growth.

Students' demographic characteristics are unlikely to be *causal* factors of COR growth (for instance, students' being a certain race or gender is an unlikely explanation for their success). This is evident in the results of tests. This is also plainly evident in the qualities of the highest- and lowest-performing students themselves: a variety of genders, races, domestic origins, and academic orientations are represented in both groups. Nevertheless, this information may offer some clues. It is valuable to note, for instance, that two of the three most negative gain scores are third years (and, more broadly, that -4 was the most common gain score in the admittedly small sample of third years in the study). By contrast, all five of the most positive gain scores belong to first-year students. This would appear to run contrary to common sense—ostensibly, older, more experienced students would find it easier to master the second test than their first-year counterparts. However, the third-year students who participated in this study belonged to a small subset of third years enrolled in a first-year composition course (as the “first-year” designation suggests, most upper-level students have already taken these courses). There are many reasons why a third-year student might do this. While a simple scheduling difficulty could be to blame, it could also be the case that the student previously attempted to take the course but failed or had to withdraw in the middle of the semester. This could constitute a selection bias. The kinds of third-year students most likely to take first-year writing courses could be those who are also most likely to have previously struggled in writing courses. This would explain their apparent overrepresentation in terms of highly negative gain scores. However, this is just one possible explanation, and, given the dearth of third-year students in this study, it would be unwise to draw any strong conclusions from these results alone.

Posttest/Gain Score Results in Context

When students' posttest and gain score performances are considered alongside the textual analysis and prior research, several important ramifications of the findings become evident. These ramifications should be viewed with caution, as this study lacked the ability to establish firm cause-and-effect relationships. Nevertheless, these ramifications are of some consequence

for current and future efforts to study students' COR (and to contribute to civic education initiatives more broadly).

First, the results of this study support the thesis that explicit instruction in the COR competencies and the component skills of the COR assessment can indeed produce a measurable gain in students' COR that does not necessarily occur in the absence of this instruction. Prior work by McGrew (2020) demonstrated that students who received a COR-centric curriculum achieved significant COR growth on the Lateral Reading, Claim Research, and Evidence Analysis portions of the COR assessment. While performance on the Ad Identification task did not improve during McGrew's study, McGrew noted that the curricula involved in her study did not include assignments that explicitly required students to make judgments about websites' credibility based on visual cues (2020, p. 9). This is consistent with the notion that students can learn COR through course curricula: when a particular COR skill appears in a curriculum, students gain proficiency with that skill, and when it does not, they don't.

However, McGrew's study lacked a control group that completed the pre- and posttests without receiving the COR curriculum, so McGrew was unable to conclude with certainty whether the COR curriculum caused students' COR gains. However, the results of the current study lend partial credence to this possibility. While all of the participating course sections in this study completed the same assessment as the McGrew students did, none received explicit, deliberate COR instruction. Instead, they received several different first-year writing curricula whose course documents invoked the COR competencies and skills to varying degrees. As might have been expected for a hypothetical control group in the original McGrew study, the students in this study did not significantly improve on two of the items (Claim Research and Evidence Analysis) that the students in the McGrew study did improve on. This supports the possibility that some kind of systematic difference in the students' experiences is responsible for the McGrew students' superior performance on these items; curricular difference certainly seems the most parsimonious possibility.

However, it is important not to view this study as one that "completes" or "replicates" McGrew's. A number of differences preclude strong comparisons between the two studies. As has been noted, the students in this study differed from the students in the McGrew study demographically, in terms of their age, and (likely) in terms of their academic profile. Another key caveat is that the results of this study still contain idiosyncrasies that the hypothesis of

curricular differences accounting for differences in COR skill growth cannot easily explain. The improvement of students' Lateral Reading performance in this study, for instance, poses a problem for this hypothesis: why did students who did not receive explicit instruction in this skill nevertheless appear to make modest gains? While the magnitudes of the changes being discussed mitigate this particular criticism somewhat (the McGrew students improved more than the students in this study did), the results of this study allow for the possibility that COR skills can be imparted through curricula that do not reference these skills explicitly (or perhaps even through curriculum-irrelevant factors, like the mere experience of adjusting to college life).

Other ramifications of this study's results derive from the fact that no single course section exhibited posttest or gain score performance that significantly differed from any of the other courses despite the diversity of assignments, reading lists, and curricular approaches on display. This suggests (though cannot prove) that, when FYC teachers do not take deliberate efforts to teach COR skills, curriculum does not play a decisive role in COR growth. One aspect of the study's findings that lends additional evidence to this possibility is the fact that the Spring A, B, and D sections did not see their COR growth rates differ from those of the Fall A and Spring C sections. As mentioned previously, the Spring A, B, and D sections all shared the Digital Rhetorics syllabus approach, and all used a very similar assignment sequence that included an annotated bibliography and a "Mapping the Problem" essay. The assignment sheets for these two projects invoked the COR codes more frequently than most of the other course documents combined. Nevertheless, students in these courses were not significantly more likely to make COR gains over the course of the semester. In fact, there is some evidence that the two courses that did *not* employ the Digital Rhetoric syllabus approach and the COR code-heavy projects were more effective at the level of individual students. The Fall A and Spring C sections featured the individual students with the largest gain scores (though it should each of these courses also produced a student whose performance tied for the status of biggest decrease). The success of these two students provides some circumstantial evidence that, for some students, a broad, varied set of assignments can produce COR gains that are borne out in assessment scores. The Fall A and Spring C sections both assigned students projects that did not appear in any of the other sections (like memoirs, critical reviews, and TED Talk-style presentations). These may have encouraged students to exercise their creativity and critical thinking skills to a greater degree than the (more uniform) sets of assignments used in the Spring A, B, and D sections.

This, in turn, may have had some knock-on effects for COR. However, without a much larger sample and a more detailed understanding of how the experiences of individual students in courses like ENGL 106 and 108 can vary, this hypothesis cannot be confirmed.

Finally, the results of this study raise ramifications for the methodologies employed in the study themselves. The decision to use quantitative methodologies more commonly employed in fields like educational psychology appears to be vindicated. Given the right incentive (in this case, a relatively small amount of extra credit), students in first-year writing courses generally appear willing to complete short assessments whose results can be analyzed quantitatively. Moreover, given the proper training, raters without extensive experience in quantitative analysis can produce reliable results on at least some assessment items. Though the present study only represents a modest contribution to writing studies literature, the fact that its quantitative portion appeared to at least produce the desired kinds of information bodes well for future attempts to apply quantitative techniques to other problems in the field. If first-year writing students can provide valuable quantitative information about COR, they may also be able to provide quantitative information about other topics of import: their peer review experiences, their argumentative skills, their fluency in various professional genres, and their capacity to reflect on their own writing, to give just a few possibilities. Rich quantitative information about any of these topics would be of immediate use for writing studies writ large.

The benefits of the qualitative textual analysis used in this study are less clear in retrospect. The qualitative text analysis ultimately served the purpose of identifying bird's-eye differences in the curricula of participating course sections. It did not, in other words, seek the kinds of evidence that would allow researchers to establish a cause-and-effect relationship between curricular features and COR assessment results. Despite this qualification, the unexpected lack of section-by-section differences in overall COR skill gains meant that the significance of the curricular differences revealed by the qualitative analysis was uncertain. While the analysis was able to reveal some bird's-eye trends that warrant discussion (like the similarity of the Spring A, B, and D curricula and the relative dissimilarity of the Fall A and Spring C curricula), its main finding was negative: course documents that mention COR-adjacent skills and concepts frequently did not necessarily produce COR gains in the students who must follow their instructions. The qualitative analysis also suggests, though does not prove, an unpleasant possibility for first-year writing instructors: unless teachers devote significant space

in their curriculum to explicit instruction in COR skills, differences in curricula and teaching style do not affect students' COR gains very much. The presence of learning outcomes like critical thinking and source evaluation on course syllabi alone do not necessarily ensure that students will be able to demonstrate they have achieved these outcomes outside of narrow context of the work done for the course. This set of tentative findings does not point the way to future research projects in the way that a positive finding might have (i.e., if this study's main finding were "certain kinds of assignments or syllabus approaches identified in this study *may* impart measurable COR gains," follow-up projects would be obvious).

Another possibility that cannot be discounted is that text analyses of course syllabi and assignment sheets do not provide accurate information about the prevalence of certain themes, skills, and concepts in course curricula on their own. If this is the case, the Spring A, B, and D sections may have devoted less time and energy to teaching COR skills than the other two courses even though the analyses of their course documents implied the opposite. Future studies should investigate the utility of textual coding as a means of analyzing curricula. If it cannot be proven to accurately predict learning outcomes, it may need to be discarded in favor of other strategies like course observations, interviews, focus groups, or some combination thereof.

CHAPTER 6: CONCLUSION

This chapter concludes the dissertation by reflecting on the implications of the research project described in the preceding chapters. It first recapitulates the project's main research questions and examines the degree to which the results of the study answered these questions. Then, it explains several factors that prevented the study from reaching firmer conclusions and provides suggestions for improving similar studies of COR in first-year composition. Following this, the chapter discusses the SHEG COR assessment itself, noting its overall usefulness in the novel context of the first-year composition classroom but also acknowledging some difficulties that occurred during its implementation. A brief discussion of possible causes for these difficulties follows. Next, the chapter outlines several objectives for future research that would lead scholars toward a clearer understanding of the effects of everyday teaching interventions that occur in first-year writing courses. Finally, this chapter (and the dissertation) concludes by addressing stakeholders the field of rhetoric and composition. It reiterates that scholars in this field have important contributions to make to future civic education efforts, and it calls for teachers and researchers in this field to seek the kinds of information that will allow them to make precise, confident claims about how their courses can teach students to be responsible citizens. This section argues that this will require, among other changes, gaining greater competence with quantitative methodologies, striving to engage with other fields in the academy, and approaching pedagogical research with a sense of epistemological humility.

Revisiting Research Questions

Chapter 1 posited the following research questions for this dissertation:

1. Do first-year composition courses with learning outcomes that emphasize skills like critical thinking, digital literacy, and source evaluation produce gains in the skills of civic literacy, even when these courses lack an explicit civic component?
2. If so, do differences in course curricula correspond to differences in students' mastery of these civic literacy skills?

The study described in this dissertation used the construct of Civic Online Reasoning (COR) as a stand-in for civic literacy skills in general. Because this study did not contain a

control group (i.e., a group of participants who did not take a first-year composition course but still took the COR assessments), no definitive cause-and-effect relationship between first-year composition curricula and students' COR gains can be established. With that major qualification in mind, the results of this study suggest the possibility that certain approaches to first-year composition may encourage some growth in the COR component skills of Ad Identification and Lateral Reading. Growth in the other two COR component skills—Claim Research and Evidence Analysis—was not observed. There is even a possibility that students become worse at these tasks over the course of a single semester of first-year composition (though the skill decline for these items was not significant). While the study's results are hardly definitive, they provide some evidence that the answer to the first research question may be “yes, though they likely convey some civic literacy skills better than others.”

While individual students varied greatly in terms of their performance, differences in course curricula did not appear to produce significant differences in performance between sections. Notably, students in three participating course sections that had an explicit focus on digital writing and whose course documents contained many references to COR competencies did not produce significantly different scores than students in the other two sections. These results provide evidence that the answer to the second research question may be “no” as far as the curricula in the ICaP program are concerned. These results certainly do not preclude the possibility that some combination of curricular or pedagogical factors that the study did not capture might produce higher COR gains (this idea is explored in greater detail below). However, the results do suggest that common interventions like writing projects and readings may not necessarily convey COR skills by simple virtue of engaging with COR-associated concepts. Furthermore, while instructors' day-to-day activities and interactions with students were not documented, the lack of significant differences between sections gives some indication that instructor effects on COR may be small.

The apparent irrelevance of course curricula and/or instructor effects on COR skill growth may appear discouraging for teachers and administrators dedicated to the mission of civic education. At first glance, this study's results suggest the possibility that, no matter what first-year composition teachers do, students in their courses can only expect to make modest and uneven COR skill gains. However, it bears repeating that the participating instructors were asked not to modify their ordinary curricula while participating in the study. Thus, none of the students

who participated in the study experienced interventions specifically designed to teach COR component skills or to mirror the tasks in the COR assessments provided by SHEG. A first-year writing course that did focus on the general task of civic education or the specific COR component skills may very well produce robust gains. This outcome would accord with studies like McGrew (2020), which found that courses in other fields that offered explicit COR instruction did see students make gains in skills like Claim Research and Evidence Analysis. Rather than arguing that first-year composition teachers will produce middling COR gains regardless of what they do, this study's results argue that first-year composition teachers will produce middling COR gains provided that they do not dedicate significant course time to teaching COR.

In sum, this study generated some evidence that first-year composition courses can convey COR skills—probably enough to justify future research, at the very least. However, the potential for first-year composition courses to convey general civic literacy skills (or even the COR skills specifically) without a sustained and deliberate focus on those skills should not be overstated. The effects of this study, even when statistically significant, were small. In the cases of the Ad Identification and Lateral Reading items, the median gain score was 0. The average student, in other words, did no better on the posttest than on the pretest. The significant changes observed on these items were attributable not to a broad skill increase across all participants, but instead to the improvements of a minority of participants outweighing the skill declines of a still smaller minority. The marginal nature of these gains should not disqualify them from attention or further study. It does mean, however, that scholars who make claims about the effects of first-year composition on COR should take care not to conflate statistical significance with practical significance.

Problems Apparent

While the possibilities presented by the study represent exciting possibilities for additional study, they do not represent definitive conclusions. A variety of problems—some avoidable, some not—prevented the study from producing truly conclusive results. This section lists several of these problems and provides suggestions for remedying them in future research projects.

The most significant of the study's flaws was its small sample size. Though over 100 students participated in the study to some degree, only 45 completed every item on both the pretest and posttest. Thus, only these 45 students' results could be used to calculate gain scores. This meant that some of the most important comparisons in the study—for instance, the comparison of full-test performance between sections—suffered from a lack of statistical power. The smaller sample available for these calculations may have prevented some significant effects from being detected. While a few significant trends emerged even in spite of this problem (specifically, the significant gains on the Ad Identification and Lateral Reading Items), the lack of a larger sample for comparisons between sections make the argument that curricular differences between first-year composition courses do not produce different COR gains less persuasive than it might otherwise have been. Fortunately, this study's results also point to a clear fix: consistent implementation of extra credit incentives across all sections. The attrition rate was much smaller in sections that implemented extra credit—not only in terms of students who completed both the pretest and posttest, but also in terms of students who completed every item on each test. It is encouraging to observe that such a small and simply implemented incentive can greatly improve the quality of the data.

Another potential problem with the study whose influence on the results is currently unknown (but which could be large) was the unexpected requirement to conduct the study online. As mentioned in chapters 1 and 3, the COVID-19 pandemic caused Purdue University to rapidly transition to remote modes of instruction in March 2020. While some on-campus instruction resumed in August 2020, remote instruction remained an option through the 2020-2021 year, and all but one of the course sections that participated in this study were conducted entirely online. As a result, the study needed to be conducted entirely online. This meant not only that the students completed an electronic version of the central COR assessment, but also that the primary researcher had to conduct important tasks like recruitment through digital interfaces (e.g., email and video chat services).

It will likely be years before the effects of the COVID-19 pandemic on students' educational outcomes are fully understood. However, research conducted prior to the pandemic has documented a variety of challenges online modalities can pose for instructors and students. To a greater degree than face-to-face courses, online courses require students to be self-motivated and to manage their time effectively (Hsu & Shuie, 2005; Roper, 2007). For this reason, they may

disadvantage students who lack these skills. Students' background, especially factors like their prior experience with digital tools and their English proficiency, can also impact their experiences in online classrooms (Luyt, 2013; Tsai & Lin, 2004). Finally, students in online courses can struggle to forge connections with other students and to view themselves as members of learning communities. This can manifest in higher-than-average attrition rates for online courses (DiRamio & Wolverton, 2006), though interventions like collaborative projects can ameliorate this (Niess & Gillow-Wiles, 2013; for a helpful review of pre-pandemic literature on online teaching that includes discussion of additional challenges, consult Kebritchi et al., 2017). Any (or all) of these factors could have affected the results of the study. Moreover, the unique circumstances of the COVID-19 pandemic—wherein much larger numbers of students than normal were forced to take online courses, with little choice in the matter—may have exacerbated these effects. The consequences of online instruction in the context of this study are unclear. Thus, the possibility that this study's results would have been substantially different during an “ordinary” year of face-to-face instruction should, unfortunately, not be discarded until additional research can be carried out.

One negative impact of COVID-19 that was abundantly clear at the time the research was conducted was that the pandemic prevented a greater variety of curricula and pedagogical approaches from being examined. As mentioned in chapter 4, only two syllabus themes were represented in this study: Academic Rhetorics and Digital Rhetorics (additionally, the Digital Rhetorics courses had very similar assignment sequences). This pedagogical homogeneity was a byproduct of the pandemic, as these were the only two syllabus themes approved for online instruction. An ideal version of this study with a larger sample size would also have taken care to include a greater number of syllabus themes, a greater variety of assignments, and, if possible, a greater number of teaching modalities. While the sections that participated in the study did not produce significantly different COR skill performance, it is possible that sections featuring different syllabus themes, assignments, or modalities may have produced different results. Of the four syllabus themes not represented in this version of the study (Public and Cultural Rhetorics, Rhetorics of Narrative, Rhetorics of Data Science, and Rhetorics of Science and Medicine), Public and Cultural Rhetorics appears especially apropos to study of civic literacy skills, given that theme's explicit focus on public discourses. As Purdue University sheds the precautions required during the 2020-2021 academic year, first-year writing instruction will likely revert to a

status quo that permits several different pedagogical approaches, rather than the two represented in this study. For now, the relevance of this study's results to Purdue's writing program outside of the immediate context of the COVID-19 pandemic is uncertain.

Finally, the researcher may have improved the study by using a longer, more detailed COR assessment. In the current version of the assessment, each COR component skill corresponds to only a single item on the pretest and the posttest. In general, measurements of constructs like COR tend to be more reliable when they occur over multiple items (provided that all of the items are well designed). If the assessment contained multiple items that measured the Lateral Reading skill, for instance, the chance that a particular student would earn a score above or below their "real" Lateral Reading score would be smaller. It would also decrease the influence of any item that tended to produce skewed or inaccurate results. However, as the next section will discuss, improving assessments' reliability is not as simple as making assessments longer and more redundant. Certain practical considerations also complicate the task of creating a more reliable COR assessment.

Improving the Study

Several methodological changes would have permitted this study to offer more definitive conclusions. Most importantly, a larger sample would almost certainly have produced clearer results. If the p-value of the increase in Ad Identification scores were 0.004, rather than 0.04, the possibility of the increase in Ad Identification performance being a fluke (for instance, an effect of the students who participated in the survey or the propensities of the raters) could be all but discounted. Such a p-value would be a very realistic possibility if the sample in this study were merely twice as large. In fact, when the researcher created an artificial data set for the Ad Identification item that contained a duplicate of each student's score (i.e., a set of Ad Identification scores twice as large but with the same median and mean), the p-value was indeed an order of magnitude smaller. A larger sample would also make any demographic effects clearer. In addition, representation of some demographic groups was so low in this study that the practical significance of observed trends (e.g., the tendency of Hispanic/Latino students to score higher on the pretest) is dubious, even when those trends are mathematically significant. This makes the researcher's inability to implement extra credit incentives in most of the Fall 2020 sections unfortunate. Given the drastic difference in posttest participation observed between

sections with and without an extra credit incentive, the sample available for the most important calculations in this study could very well have been twice as large with this simple change implemented.

As mentioned above, an institutional context of face-to-face instruction would have allowed this study to examine a greater number of curricular approaches. Though it is difficult to predict precisely how this dissertation would have progressed outside of the context of the COVID-19 pandemic, it is possible that a version of the study conducted face to face would have included a larger sample as well. Such a study would not have required students to complete surveys in their homes and on their own time, but instead could have provided students with facilities on campus during or just after scheduled course meetings. The primary researcher would also have had opportunities to speak to students face to face during crucial stages of the study (e.g., initial recruitment and invitation to the posttest), rather than being forced to communicate via video calls, emails, and messages posted to course LMSes. The more personal modes of communication available during a typical academic year may have had ramifications for participants' motivation and attrition rates.

A version of the COR assessment with additional items would produce richer and (likely) more reliable data. However, producing and administering a longer COR assessment would not be as easy as adding parallel items to the pretest and posttest. One reason is that, at the time of writing, SHEG has not produced enough parallel versions of the items in this study's COR assessment for this to be possible (for some items, two parallel items are available, for others, just one). Developing additional items would require those items to be piloted and validated, just as the original items were. Another problem is that adding additional items to the assessment increases the effects of fatigue on students' responses. A longer assessment may cause more students to give up before reaching the end than was the case for the four-item assessment used in this study. Even students who do complete the longer assessment may produce weaker responses at the end of the assessment simply because they are tired or frustrated. Given the attrition issues that were already apparent in this study, these concerns should not be ignored. Finally, in a context of face-to-face instruction, logistical challenges would accompany a longer assessment. Space would need to be reserved, students would need to be supervised while they completed the assessment, and, if the assessment were long enough, students may need to be compensated for their time. Thus, the development of a longer COR assessment capable of

generating richer data constitutes a serious research project in itself. Ideally, researchers undertaking this project could work in conversation or collaboration with SHEG to ensure the construct validity and reliability of any new items are satisfactory.

Future Work

Much work remains before researchers can claim a firm understanding of the role of writing instruction in civic education. One vital future project would be to simply repeat this study with all of the changes suggested above as well as a control group. Neither this study nor McGrew (2020) included a set of participants who did not receive an intervention (first-year composition instruction in the case of this study, COR-centered lessons in the McGrew study). This means that researchers cannot make definitive claims about the cause-and-effect relationships between the interventions in question and COR. It also means that a troubling possibility cannot be discounted: that students' COR performance would improve even absent these interventions. Given the small effect sizes documented in both studies, controlled trials are urgently needed to rule out such a possibility.

The potential to pursue more ambitious projects also presents itself. A systematic series of exploratory studies carried out at multiple institutions could examine a much broader range of contexts and curricular approaches than appeared in this study. If one or more particular contexts or curricula produce unusual trends in students' COR outcomes, a subsequent series of controlled trials could confirm a cause-and-effect relationship. Scholars could also develop and test COR-centric curricula designed for first-year composition classrooms. While the students that participated in this study only achieved small and uneven COR gains, there is every reason to imagine that students who took a version of the course that frequently invited them to practice COR skills would convey a greater benefit.

Scholars with access to the requisite time and resources could also venture beyond the work of SHEG and its affiliated researchers by developing valid, reliable assessments of civic skills students specifically designed for first-year writing courses. The study in this dissertation examined COR—a construct originally defined and operationalized by scholars of history—because no similar assessments have yet been developed by rhetoric and composition scholars. If scholars with experience teaching and researching first-year composition want these courses to play a central role in universities' civic education efforts (as this dissertation argues they should),

developing civic assessments for first-year composition courses would be a wise use of their energies. The process of developing these assessments would be protracted and difficult, and it would require rhetoric and composition scholars not only to engage with work from other disciplines, but also to adopt the modes of inquiry common to those disciplines. The reward, however, would be great: teacher-scholars with a major stake in first-year composition courses would be able to demonstrate precisely how those courses make students better citizens, and they would be able to do it in terms that they themselves have defined.

Ramifications for COR Research

One of the largest uncertainties in this study was the question of whether a series of items developed and tested in an entirely different educational context would produce comprehensible results when administered in the context of a first-year composition classroom. While the study's results are not definitive, the COR assessment itself appears to have functioned more or less as intended. When extra credit incentives were implemented, the assessment had a satisfactory participation rate, and only in a few instances did students' responses indicate confusion, frustration, or offense. Moreover, the fact that students' pretest scores broadly agreed with those in McGrew (2020) suggests that the assessment could accurately detect poor COR performance in both contexts. This would support the idea that students' posttest performance in this study differing from that in McGrew (2020) was at least partly due to the educational interventions administered in the ICaP program and not merely due to some inadequacy of the assessment in the new context.

That said, the interrater reliability scores generated during the study highlighted the difficulty of implementing COR assessments outside of the contexts they were originally designed for. While raters achieved satisfactory reliability for the Ad Identification and Lateral Reading items, they fared poorly for the other two items. Troublingly, the use of a third rater did not clarify matters, as the third rater disagreed with each of the original raters more than the original raters disagreed with each other. The reliability scores generated when the third rater's scores were used were only slightly better than would be expected if raters had assigned scores at random—hardly a sign that scoring for the Claim Research and Evidence Analysis had proceeded as intended.

The poor reliability scores alone are not necessarily a sign of inherent flaws in the Claim Research and Evidence Analysis items. A variety of causes may be responsible: insufficient rater training, insufficient operationalization of the Claim Research construct, insufficiently detailed rubrics, and sheer chance, to name just a few. The fact that students were asked to complete the COR assessments without receiving any COR instruction may also have played a role. During the McGrew (2020) study, students received eight lessons across three modules organized around the three core COR competencies. Thus, students completing the posttest in the McGrew study would have already encountered questions and activities like the ones in the posttest and may thus have been less likely to become confused by the posttest items. Finally, it bears repeating that, because the Claim Research item has a larger scale than the other items, precise agreement on that item could be expected to be more difficult. That said, the poor reliability results, when viewed alongside the raters' reports of difficulty scoring the Claim Research item and the handful of student responses to the posttest Claim Research item that suggested confusion or frustration, raise the possibility of some kind of problem with the content of this item, its scoring criteria, or both. Researchers should keep the potential for these kinds of problems in mind when the item is deployed in a new context.

Researchers attempting to study COR in new contexts should not underestimate the importance of tasks like rater training and score norming. Nor should they underestimate the difficulties students will experience when tackling COR assessments that might appear straightforward to researchers (especially when students have not practiced similar tasks already). In other words, if future studies' designs demand that students not receive explicit COR instruction prior to taking a COR assessment, some confusion should be expected. For SHEG's part, the group already publishes a variety of free lessons and activities that teachers can use to introduce students to the general concept of COR and its component skills. One helpful addition to the SHEG catalog would be larger sets of sample student responses to the various assessments the group offers (currently, most COR assessments' rubrics are only accompanied by one or two sample responses per scale point). These sets of sample responses could be valuable tools for researchers attempting to train raters to assess COR in new contexts, especially if the responses are accompanied by scores awarded by trained SHEG raters.

New Means of Persuasion

The first chapter of this dissertation posited two primary research questions that have already been discussed in this chapter. However, it also posited a third, implied research question. That third question was “what do the projects, readings, discussions, and in-class activities that comprise a typical first-year composition classroom *do*, in a strictly empirical sense?” Such a question may have struck scholars in the field of rhetoric and composition—a field whose research frequently, though not exclusively, focuses on first-year composition courses—as condescending. From the point of view of an experienced teacher-researcher, it is probably already quite clear what the day-to-day interventions of first-year composition classrooms do. They offer opportunities to practice modes of expression that are vital to material success and personal fulfillment. They teach concrete skills that can support students in a huge range of academic and professional fields. They allow students to explore topics of social and political import through sustained inquiry, often for the first time in their lives. They make students think of themselves as thinkers—people with full, rich intellectual lives worthy of sharing with other people, who are themselves thinkers.

Many rhetoric and composition scholars who teach first-year composition courses know that the interventions they use do all of these things and many, many more. How tragic it is, then, that few rhetoric and composition scholars who teach first-year composition courses can demonstrate all of the wonderful things that students get from their courses in terms that stakeholders outside the field will appreciate. This inability to make definitive claims is especially apparent in the mismatch between scholars’ efforts to cast rhetoric and composition as an antidote to civic maladies like fake news and authoritarianism and their inability to offer evidence that courses taught by rhetoricians can actually combat these things. To provide just one example: McComiskey’s *Post-Truth Rhetoric and Composition* (2017) offers what is probably the most passionate and convincing mission statement the field has produced to date with regards to its post-2016 sense of civic purpose. Yet *Post-Truth* can only offer disciplinary statements of values as evidence that the field has the tools to accomplish this mission. It is one thing to acknowledge that important documents like the *Framework for Success in Postsecondary Writing* (Council of Writing Program Administrators, et al. 2011) and the *WPA Outcomes Statement for First-Year Composition* (Council of Writing Program Administrators, 2014) prize skills like creativity, rhetorical acumen, and curiosity, which would seem to run

counter to modes of thought that would be receptive to misinformation. It is another thing entirely to persuasively argue that courses like first-year composition can effectively convey these skills.

The problem extends well beyond the field's arguments for its civic importance. It is not hard to pose relatively elementary questions about first-year composition pedagogy for which no definitive answers exist. If 100 students take a first-year composition course with a particular syllabus theme, how are those students' outcomes likely to differ from those of 100 students who take a version of the course with a different syllabus theme? Does it matter, in terms of research skill development, whether first-year composition students write essays about ongoing scientific controversies, or about ongoing controversies on fanfiction forums? How many and what kinds of first-year composition assignments are most associated with growth in hard-to-define skills like critical thinking? How can first-year composition teachers reliably measure these skills in the contexts of their classrooms? Do first-year composition courses and courses in other subjects differ in terms of how effectively they convey the skills just mentioned?

Thanks to a paucity of quantitative, empirical work in the field, teachers seeking answers to these questions must turn to fields like educational psychology. Of course, the observation that the field of rhetoric and composition is broadly inhospitable to empirical and (especially) quantitative methodologies is hardly new. Nearly three decades ago, Charney implored readers in the field not to treat empiricism as "a four-letter word," writing that calls within the field to abandon scientific modes of inquiry unfairly conflated these modes of inquiry with a host of reductive and politically reactionary beliefs (1996, p. 568). Charney argued that a hesitance to experiment with objectivist methodologies ultimately hurt the field: "the numerous socially-situated ethnographies, and case studies, excellent though each may be, cannot by themselves sufficiently extend and refine our methods and our knowledge base" (1996, p. 590). In the intervening years, several dissenting voices have echoed Charney's concerns. Haswell, for instance, wrote that the field's methodological rigidity is the symptom of "the field's inability, as yet, to convince scholars outside the field that it is serious about facts, perhaps its inability to convince them that it is not afraid of what those facts might uncover about its favorite practices." (2005, p. 219). More recently, scholars like Wolfe (2010), Rhodes and Robinson (2013), DeBoer (2015), and Ernst (2020) have argued that quantitative literacy can convey a variety of benefits to scholars and teachers in the field. Yet despite the calls of a persistent minority encouraging the

field to become more hospitable to empirical and quantitative methodologies for several decades, few rhetoric and composition scholars currently train in these methodologies, and, consequently, few publish empirical or quantitative scholarship.

In an earlier era, the field's refusal to adopt new research tools may not have posed any serious dangers. Today, unfortunately, the stakes are greater. As the first chapter of this dissertation noted, the years since the 2008 financial crisis have seen a broad and sustained drop in enrollment across humanities programs nationwide. As a result, many such programs have faced steep cuts (it is no coincidence that the English department at Purdue University, the site of the study in this dissertation and the place where the primary researcher works, has faced its own cuts in recent years). To put the matter simply, the current context in higher education is one in which rhetoric and composition scholars cannot presume that administrators will always share their respect for the discipline.

However grim the trajectory of the humanities may currently appear, a decline into irrelevance for disciplines like composition and rhetoric is by no means inevitable. Trends in higher education change, and it is not hard to imagine situations that could reverse this decline. A renewed focus on civic education—fueled, perhaps, by the emergence of political realities that would have struck previous generations as unthinkable—may inspire administrators and policymakers to reinvest in the humanities. This, in turn, may prove a boon not only for first-year composition programs, but for English programs more generally. It is also possible to imagine the humanities rebounding for less noble reasons. For instance, humanities programs could benefit immensely if industry leaders begin prioritizing of skills like creativity and critical thinking, which thus far have proven difficult to automate, during hiring processes. However, if first-year composition teachers cannot definitively prove that their courses are effective sites for students to gain the kinds of skills just described, they should not take for granted that they would be able to take advantage of that turn of events. And if favorable trends do not materialize, the need to prove to administrators and policymakers that first-year writing courses convey desirable skills in terms those audiences understand will be all the more urgent.

This is why it is so important for scholars in rhetoric and composition to seek more persuasive categories of evidence about all of the edifying, ennobling, and useful things their courses do for the students who take them. Such a task will admittedly be a long and difficult undertaking. It will also require great humility and bravery. It will require humility because

scholars will need to admit that their favored tools and arguments are not suitably persuasive for the task at hand. It will require bravery because they will need to pursue new, challenging modes of thinking and, crucially, to withstand the criticism of peers who see these new things as threats to the field's core identity. A shift toward empirical and quantitative research competencies will likely engender fears that the humanistic modes of inquiry that have traditionally defined the field will be discarded—that rhetoricians will trade an understanding of the aspects of communication that cannot be measured or quantified for tools that flatten human differences and ignore individuals' unique voices. When faced with these criticisms, rhetoric and composition scholars should respond, “our field may be small, but it is still big enough to accommodate multiple approaches to research. Moreover, our scholarly tradition is one that has long prized flexibility—are we not, in the words of Janice Lauer, a dappled discipline, after all?”

In fact, by taking up new epistemological tools, rhetorical scholars will not be abandoning a rhetorical tradition that spans millennia, but instead enacting it. One of the oldest and most widely known commonplaces in the field of rhetoric and composition is Aristotle's definition of rhetoric, usually expressed as the ability, in any given situation, to see the available means of persuasion. Rhetoric, in other words, is not the ability to identify persuasive tools that conform to one's ideological priors or to standards of acceptable taste within a particular group of practitioners. It is the ability to see through the distortions of ideology, convention, and familiarity to glimpse the contours of the communicative battlefield as they actually exist. Thus, this dissertation poses a question to stakeholders in rhetoric and composition as it concludes. When the time comes for the field to make compelling arguments for its own relevance, will the field be able to see all of the available means of persuasion, or just the most comfortable ones? I believe that we will—it will only be a matter of opening our eyes.

APPENDIX A. COR ASSESSMENT SURVEYS

The following questions were presented to students on the PRETEST.

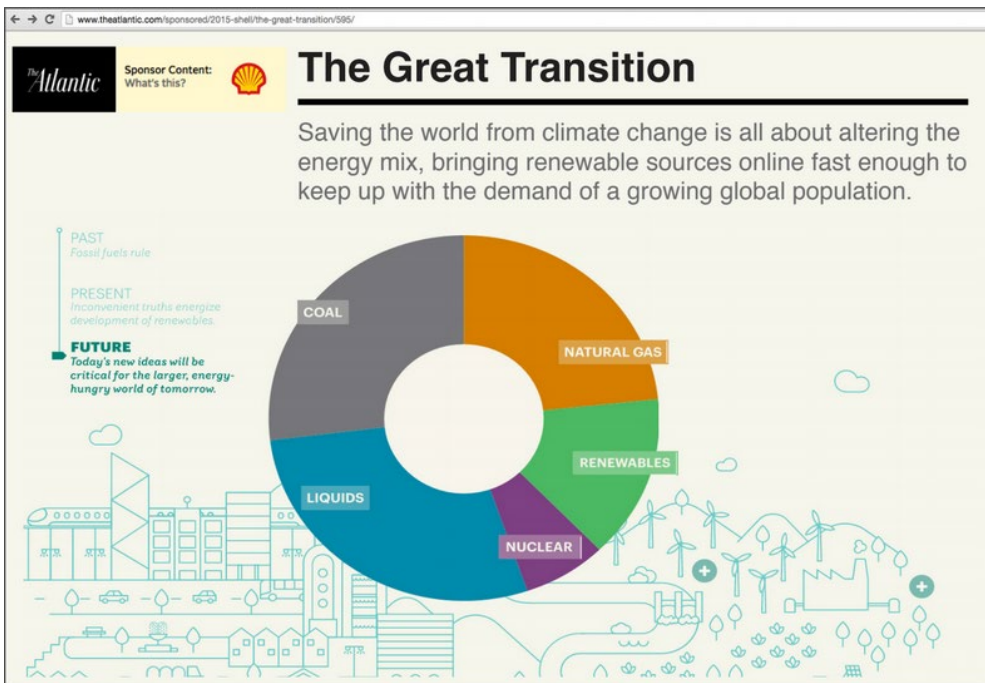
Q1 [AD ID PRETEST]

The following headlines appeared on *The Atlantic*, a news website. Both of their accompanying articles are about policies to solve global climate change.

Article A:



Article B:



Ad ID Is Article A or Article B a more reliable source for learning about policies to solve global climate change? Explain.

Q2 [LATERAL READING PRETEST]

You are researching global warming and come across this website: <http://www.co2science.org>.

Please decide if this website is a trustworthy source of information on global warming. You can open a new tab and do an Internet search if that helps.

Lat Rd 1 Is this website a trustworthy source to learn about global warming?

☐ Yes (4)

☐ No (5)

Lat Rd 2 Explain your answer, citing evidence from the webpages you used. Be sure to provide the URLs to the webpages you cite.

Q3 [CLAIM RESEARCH PRETEST]

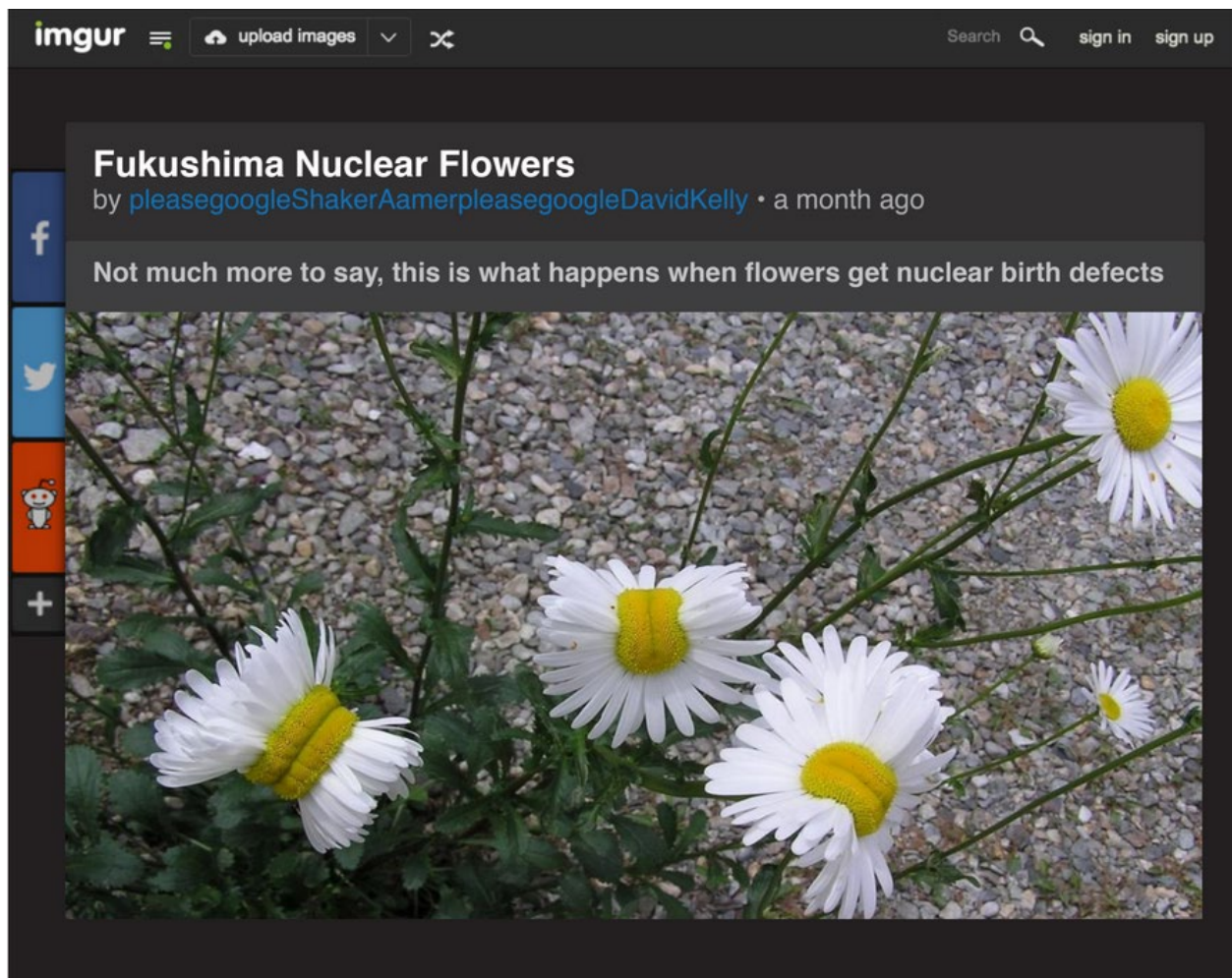
Some people claim that Cesar Chavez, the co-founder of the United Farm Workers union, opposed unauthorized immigration to the United States. Take about 8 minutes doing research online to decide if you believe this claim is true.

Claim Rsch 1 Do you believe Cesar Chavez opposed undocumented immigration to the U.S.? Explain using evidence from the websites you consulted.

Claim Rsch 2 Explain why the sources you used are strong. Be sure to include their URLs.

Q4 [EVIDENCE ANALYSIS PRETEST]

On March 11, 2011, there was a large nuclear disaster at the Fukushima Daiichi Nuclear Power Plant in Japan. This image was posted on Imgur, a photo sharing website, in July 2015.



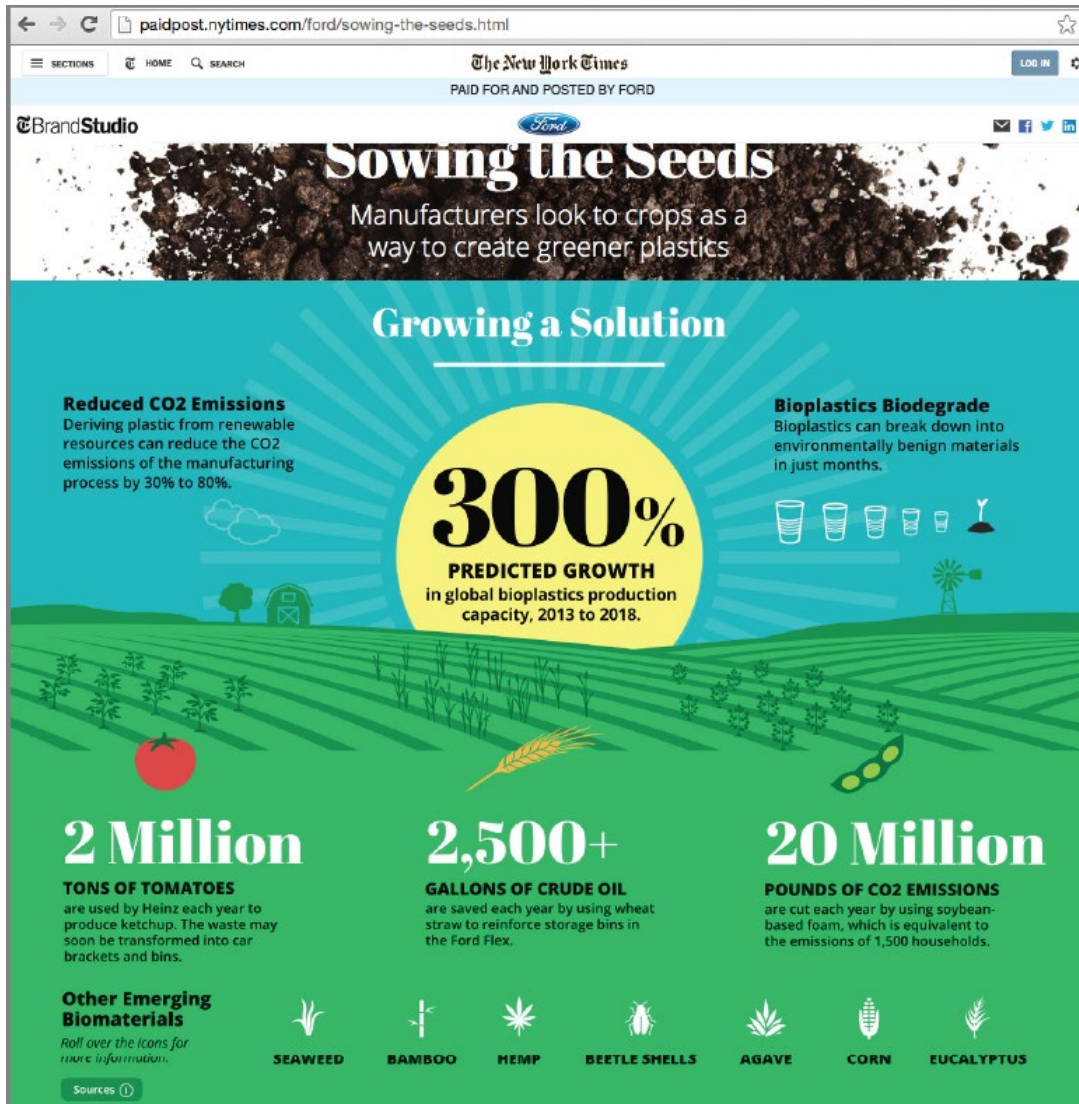
Ev An Does this post provide strong evidence about the conditions near the Fukushima Daiichi Power Plant? Explain your reasoning.

The following questions were presented to students on the POSTTEST.

Q27 [AD IDENTIFICATION POSTTEST]

The following headlines appeared on *The New York Times*, a news website. Both of their accompanying articles are about policies to solve global climate change.

Article A:



Article B:

← → ↺ www.nytimes.com/2014/12/11/science/new-research-quantifies-the-oceans-plastic-problem.html?_r=0

SCIENCE | Study Gauges Plastic Levels in Oceans

SCIENCE

Study Gauges Plastic Levels in Oceans

By JOHN SCHWARTZ DEC. 10, 2014

Facebook Twitter Email Print Bookmark 251



Plastic debris washed up on a beach in Azores, Portugal. *Morcia Eriksen*

COIT
CLEANING & RESTORATION

SAVE 40%
ON
RESIDENTIAL CLEANING

CARPET - WOOD FLOOR
TILE & GROUT - AREA RUGS
AIR DUCTS - UPHOLSTERY

**100% MONEY
BACK GUARANTEE**

SAVE NOW



Q29 Is Article A or Article B a more reliable source for learning about the impact of plastics on the environment? Explain.

Q31 [LATERAL READING POSTTEST]

You are researching climate change and come across this website:

<https://www.friendsofscience.org/>.

Please decide if this website is a trustworthy source of information on climate change. You can open a new tab and do an Internet search if that helps.

Q33 Is this website a trustworthy source to learn about climate change?

☐ Yes (4)

☐ No (5)

Q35 Explain your answer, citing evidence from the webpages you used. Be sure to provide the URLs to the webpages you cite.

Q37 [CLAIM RESEARCH POSTTEST]

Some people claim that Margaret Sanger, the founder of Planned Parenthood, supported euthanasia. Take about 8 minutes doing research online to decide if you believe this claim is true.

Q39 Do you believe Margaret Sanger supported euthanasia? Explain using evidence from the websites you consulted.

Q41 Explain why the sources you used are strong. Be sure to include their URLs.

Q43 [EVIDENCE ANALYSIS POSTTEST]

A civil war in Syria began in 2011 and continues through the present. This image was posted on Twitter, a social media platform, in January 2014.



Q45 Does this post provide strong evidence about conditions for children in Syria?

Explain your reasoning.

The following DEMOGRAPHIC questions were also presented to students.

Thank you for your responses. To conclude, please answer the following demographic questions.

What is your gender?

- ☐ Female (1)
- ☐ Male (2)
- ☐ Self-identify (3) _____
- ☐ Prefer not to disclose (4)

Q43 Please select your current academic status.

- ☐ First year/freshman (1)
- ☐ Second year/sophomore (2)
- ☐ Third year/junior (3)
- ☐ Fourth (or higher) year/senior (4)

☐ Prefer not to disclose (5)

Q45 Please select the college that houses your major (or, if you have not yet declared, your intended major).

☐ College of Agriculture (1)

☐ College of Education (9)

☐ College of Engineering (10)

☐ College of Health and Human Sciences (12)

☐ College of Liberal Arts (13)

☐ Krannert School of Management (14)

☐ College of Pharmacy (15)

☐ Purdue Polytechnic Institute (16)

☐ College of Science (17)

☐ College of Veterinary Medicine (18)

☐ Other/Undecided (19)

☐ Prefer not to disclose (21)

Q47 Did you reside in a country outside the United States before attending Purdue?

☐ Yes (1)

☐ No (2)

☐ Prefer not to disclose (3)

Q49 Please choose the category that best describes your racial identity.

☐ White/Caucasian (1)

☐ Black/African American (2)

☐ American Indian/Alaska Native (3)

☐ Asian (4)

☐ Native Hawaiian/Pacific Islander (5)

☐ Other (6) _____

☐ Prefer not to disclose (7)

Q51 Are you of Hispanic, Latino, or Spanish origin?

☐ Yes (1)

☐ No (2)

☐ Prefer not to disclose (3)

APPENDIX B. COR ASSESSMENT ITEM RUBRICS

The language in each of the following rubrics is copied verbatim from the official rubrics provided by the Stanford History Education Group (SHEG). For additional resources, including sample responses for each item, consult SHEG’s collection of Civic Online Reasoning assessments at <https://cor.stanford.edu/curriculum/?tab=assessments>.

Ad Identification

Mastery	Student identifies that Article B is sponsored by a company with a vested interest in the article’s topic. Student provides a clear rationale for why this makes the article less reliable.
Emerging	Student identifies Article B as sponsored content and explains that this makes it less reliable as a source, but the explanation is limited.
Beginning	Student does not identify the sponsored content as a relevant consideration or identifies the sponsored content but argues that it is the more reliable source.

Lateral Reading

Mastery	Student rejects the website as a trustworthy source because of the organization’s agenda and provides a clear rationale. Student provides reliable supporting evidence and cites the source of information.
	Student rejects the website as a trustworthy source and provides supporting evidence. However, the response falls short of Mastery because:
Emerging	1) Student provides relevant evidence and says where the evidence is from, but the explanation is incomplete. 2) Student provides a complete explanation that is supported by relevant evidence but does not say where the evidence is from.

Beginning	Student rejects the source but provides an incoherent, irrelevant, or unreasonable explanation; or the student simply accepts the source as trustworthy.
Claim Research	
Mastery	Student provides clear reasoning supported by evidence. Student provides evidence from a reliable source and considers the reliability of the source.
Partial Mastery	Student provides a clear answer supported by evidence. Student provides evidence from a reliable source but does not explicitly discuss its reliability, or the student does not provide a complete explanation.
Emerging	Student claims that there is no reliable evidence on the topic at hand.
Beginning	Student provides evidence from a potentially biased source with no consideration of reliability of the source or provides an irrelevant explanation.
Evidence Evaluation	
Mastery	Student argues the post does not provide strong evidence and questions the source of the post (e.g., we don't know anything about the author of the post) and/or the source of the photograph (e.g., we don't know where the photo was taken).
Emerging	Student argues that the post does not provide strong evidence, but the explanation does not consider the source of the post or the source of the photograph, <i>or</i> the explanation is incomplete.
Beginning	Student argues that the post provides strong evidence or uses incorrect or incoherent reasoning.

APPENDIX C. RECRUITMENT SCRIPT

I'm Joe Forte, a colleague of your teacher, who has very generously invited me to speak to you today.

At Purdue, many of the teachers you encounter are likely to be doing research behind the scenes. I am another teacher in the English department, and I'm involved with some research that I think might interest you all.

Today, we're looking for students in either ENGL 106 or 108 who are willing to take a quick survey now, at the beginning of the semester, and a slightly different survey at the end of the semester. The survey is designed to measure something called Civic Online Reasoning, or COR. It's basically a way to describe the ability to tell true information from false online. You'll complete the survey by answering a few short-answer questions about the sort of content you might regularly encounter online, including social media posts.

Here is a little more info about the survey:

- The survey is totally anonymous. I won't be able to see who you are, and your teacher won't be able to, either.
- Your responses won't have any effect on your grade. You will not be punished or penalized in any way for not taking the survey.
- The survey is benign. That means that we don't expect it to take a great deal of effort, we don't think the questions should be offensive to anyone, and the responses you give won't be things that can be used against you in any way (though, again, they are anonymous).
- The survey is quite brief. Four questions (some are two-part). We've budgeted 20 minutes for it, but I could see it taking considerably less time.

I'm happy to answer any questions you might have, though I should say that I can't answer specific questions about the questions on the survey, because that may impact your answers.

[Pause for Q&A]

You may also contact me with questions about the survey after this talk. You can find my contact information on the consent form.

Thank you all for your time, and thank you very much to your teacher for giving me the opportunity to speak.

APPENDIX D. CONSENT FORM

Civic Online Reasoning in First-Year Composition, [TERM]

Joseph Forte

Department of English

Purdue University

Key Information

Please take time to review this information carefully. This is a research study. Your participation in this study is voluntary, which means that you may choose not to participate at any time without penalty or loss of benefits to which you are otherwise entitled. You may ask questions to the researchers about the study whenever you would like. If you decide to take part in the study, you will be asked to signal your consent at the end of this form. Be sure you understand what you will do and any possible risks or benefits.

This study assesses **Civic Online Reasoning (COR)**, the ability to discern true information from false in online environments, via a brief online survey. It contains four constructed response (short answer) questions and two brief demographic questions. The researchers anticipate that the study will not take longer than twenty minutes to complete.

What is the purpose of this study?

You are being invited to participate in this study because you are currently enrolled in the Introductory Composition at Purdue program (specifically, ENGL 106 or ENGL 108). Our study focuses on the degree to which courses in this program affect students' COR. We would like to enroll a total of 100 people in this study.

What will I do if I choose to be in this study?

You will fill out a brief online survey that assesses your COR. This entails answering a series of short questions that ask you to interpret the quality of various online sources. You will be presented with several examples of online media (e.g., social media posts) and asked to make judgments about their reliability. Some questions (but not all) will invite you to use your web browser to search for information that can inform your decision making.

At the end of the semester (between April 26 and May 9), you will be invited to complete a different version of this survey. This survey will have the same number and kind of questions, but it will use different examples. By comparing the results of the two surveys, we will be able to see whether your COR increased, and, if so, how much it increased. Our goal is to determine whether a semester of ENGL 106/108 has a measurable effect on students' COR. If so, results from participating sections will be compared to determine which sections were associated with the greatest COR gains. This is an exploratory, rather than experimental study.

This survey is anonymous. You will be assigned a random ID number so that we can track your results anonymously. The only data that will be collected from this survey are your responses to the questions, including several non-identifying demographic questions at the end of the survey. Your name, or other identifying information, will not be recorded (with the exception of your responses to the demographic questions).

You will be asked to provide your email at the end of this form. Once you do this, you will receive an invitation email that will contain a link to the survey itself. Because you submit your email in a separate form, it will not be linked to your survey responses.

How long will I be in the study?

You will complete the survey once at the beginning of the semester (i.e., between January 19 and January 31) and once at the end of the semester (i.e., between April 26 and May 9). No action will be required on your part in the intervening period.

What are the possible risks or discomforts?

The risks of this study to participants are minimal. They are no greater than the participant would encounter in daily life or during the performance of routine physical or psychological exams or tests.

Breach of confidentiality is always a risk with data, but we will take precautions to minimize this risk as described in the confidentiality section.

Are there any potential benefits?

There are no anticipated direct benefits to participants.

The benefits to general knowledge and society include a greater understanding of how students' instructional practices affect development of civic literacy and online behavior.

What alternatives are available?

Individuals may choose not to participate in this research study at any time (including after they complete the initial survey). If they do so, they may still receive extra credit (see section below) by attending a free live or virtual campus event (e.g., a lecture by a visiting scholar) and writing a brief (2 pp. double-spaced) reflective report linking the themes of the event to key course concepts.

Will I receive payment or other incentive?

Instructors have been directed to offer 2.5% extra credit for completion of the survey (1.25% for the initial survey and an additional 1.25% for the second portion at the end of the semester). The researchers will provide the emails of students who participated after each half of the survey expires for the purpose of assigning extra credit. The emails will not be attached to or associated with students' responses. Students who do not participate can earn this extra credit by completing an alternative assignment (see section above).

Are there costs to me for participation?

There are no anticipated costs to participate in this research.

This section provides more information about the study.

Will information about me and my participation be kept confidential?

The project's research records may be reviewed by departments at Purdue University responsible for regulatory and research oversight.

As mentioned above, the survey does not gather identifying information beyond the answers to the demographic questions. Participants are assigned random numerical ID numbers so they may be differentiated from one another in the absence of identifying information.

Only the research team will have access to the results of the survey. The results will be used for the purpose of completing the primary researcher's dissertation. The data from this study will be stored in a secure, encrypted physical storage device. It will be destroyed at the conclusion of the dissertation study or following any research publications that derive from the dissertation. In either case, this will occur no earlier than September 2024. The data will not be provided to any registry or centralized database. In the dissertation (and any subsequent research publication), the data will only be reported in anonymous, statistical, and aggregate forms.

Federal regulations require that consent forms from this study be kept for at least three years following the completion of the study.

What are my rights if I take part in this study?

You do not have to participate in this research project. If you agree to participate, you may withdraw your participation at any time without penalty.

If you take the initial survey, you may withdraw without taking the end-of-semester survey by simply not taking the second survey. No additional action is required on your part.

Who can I contact if I have questions about the study?

If you have questions, comments, or concerns about this research project, you can talk to one of the researchers. Please contact Joseph Forte at 253-548-4424 or jforte@purdue.edu at your convenience.

To report anonymously via Purdue's Hotline, see www.purdue.edu/hotline.

If you have questions about your rights while taking part in the study or have concerns about the treatment of research participants, please call the Human Research Protection Program at (765) 494-5942, email (irb@purdue.edu) or write to:

Human Research Protection Program - Purdue University

Ernest C. Young Hall, Room 1032
155 S. Grant St.
West Lafayette, IN 47907-2114

Documentation of Informed Consent

I have had the opportunity to read this consent form and have the research study explained. I have had the opportunity to ask questions about the research study, and my questions have been answered. I am prepared to participate in the research study described above.

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