



Modern Marginalia: Using Digital Annotation in the Composition Classroom

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Abstract

Undergraduate students are immersed in technology both in and outside of the classroom. Media technologies shape their everyday life, from facilitating learning, to curating an identity on social media, to developing social relationships. While writing instructors have pushed to integrate digital media and software into their pedagogy, scholarship is still establishing best practices for incorporating these tools into specific assignment sequences. This study continues conversations about integrating digital media into the composition classroom by providing a case study on digital annotation software. By surveying Cornell University students in 5 First-Year Writing Seminars from 2016-2018, I examine how students annotated primary course texts using the platform Genius over the course of the semester. Survey data ultimately demonstrated that the majority of students perceived digital annotation (and Genius specifically) to be a productive tool for the writing classroom—in particular, students prized the platform's aesthetics, its usability, and its facilitation of peer collaboration. This study ends with a reflection on best practices for instructors, and also offers recommendations for future assignments that integrate digital annotation software.

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Introduction

We live in a world surrounded by screens, images, and videos. For our current undergraduate students especially, media technologies shape everyday life, including the acquisition of information, the development of identity, and the construction of social relationships. For students, all three of these issues are now wrapped up in digital media and social networking, which function as virtual spaces in which readers can become users, authors, and audience all at the same time. While recent research has examined the advantages and disadvantages of using technology in the classroom, it is crucial that we continue to hear directly from students about their own perceptions of using digital tools

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in the writing classroom. For students, social media and technology are often separate from their work in humanities courses, and most poignantly, separate from what they understand as writing.

This mixed-methods study adds to the large body of scholarship on the integration of digital media into composition courses by examining how digital tools alter student perceptions of reading and writing in writing-based courses. My primary focus is on using digital technology to enhance creative and collaborative writing practice, and as such, I provide a specific case study on a digital annotation software called Genius—an easy-to-use tool that allows students to both develop good editing practices and to collaboratively generate conversation in and outside of the classroom. I begin by briefly reviewing scholarship on digitality in the classroom, and move to examine how digital annotation has specifically become a point of interest for composition instructors as a tool that can improve close reading, creativity, and collaboration among students.

To analyze the effects of digital annotation, I performed a three-year pilot study using Genius in five First-Year Writing Seminars (FWS) at Cornell University. Through anonymous student surveys from five Cornell writing classes, I examine how annotation software changed student experiences of reading and writing. This survey ultimately demonstrates that the majority of students view digital annotation, and digital tools in general, as a productive tool within the composition classroom, despite some concerns that digital software is too time-consuming, too complicated, or requires too many new skills. While students recognized these concerns, they still believed that using digital tools in writing assignments produced a more creative final product, and also made it easier to both organize and communicate their ideas. Through my own notes as instructor of these five courses, I end by providing recommendations for future instructor use.

Digital Technology in Composition Classrooms

One of the only stable facts about digital technology is that it changes swiftly—as [Brian Carroll \(2014\)](#) suggests, “it makes a book on writing for digital media a bit like chasing one’s tail.” Even though it is difficult to keep up with such a rapidly changing landscape, new digital technology provides educators with an opportunity to both expand their own pedagogical methodologies and improve their students’ learning experience. As such, the ways in which students perceive technology and engage with it in the classroom have become a focal point for both education and rhetoric and composition scholars. This intent focus on digitality has far-reaching effects for these fields—for example, by tracing the usage of technology-related keywords in the *MLA Job Information List* over the last 20 years, [Claire Lauer \(2014\)](#) has documented a shift in how these fields view the use of digital technology in the classroom. Technology is no longer seen as just a tool for learning; instead, with the increased access of digital tools, digital literacy and the ability to use technology productively is now a fundamental communicative practice that dictates how universities structure their writing programs ([Porter, 2009](#)).

Access to technology has certainly increased, skyrocketing even over the last couple years. It is now a given for most instructors that every college freshman should own or have access to a computer—that they should be able to access the internet at all times for research, email, and other course purposes. For example, in 2019, 96% of all U.S. adults from ages 18-29 owned a smartphone; 90% of this age group also uses social media, with YouTube, Facebook, and Instagram being the three most popular sites, respectively ([Pew Research Center, 2019](#)).

As access to technology has expanded, both the nature of the web and student experience of the web has also shifted dramatically. Ten years ago, the use of the internet in classrooms was viewed as an educational resource akin to traditional classroom tools—for example, a website was a source of information comparative to a book, or even simply a means of displaying static content. In the last fifteen years, the goals of technology and digital media have evolved so that digital platforms often seek to facilitate a participatory, collaborative, and interactive method of learning ([Kim & Bagaka, 2005](#)). This change has spurred another shift in how researchers are studying digital media in the classroom. We moved, as [Fei Gao \(2013\)](#) calls it, from “learner–content interaction to learner–learner interaction.” Gao, citing an earlier study done by [Woo and Reeves \(2007\)](#), argues that we as scholars are becoming equally interested in how students engage with each other using digital tools, rather than only examining how well these tools ‘work’ ([Gao, 2013](#)).

This trend certainly shows up in recent composition and rhetoric studies on digital media. [J. Elizabeth Clark \(2010\)](#), for example, examines how students engage with each other and the wider world by using digital tools in composition courses in her article “The Digital Imperative: Making the Case for a 21st century Pedagogy.” She argues persuasively that as access to technology rises, traditional modes of writing pedagogy are outdated and must be replaced with

“intentional pedagogy of digital rhetoric” (p. 28). Clark moreover suggests that embracing this move towards digital writing will connect the kinds of writing that students do in their daily lives through social media and online forums to their work in school. Like Clark, I believe that digital tools are one crucial method that instructors can use (especially in college composition courses) to facilitate collaboration and a stronger connection with public audiences outside of the academy. As I will demonstrate in this study, these tools have the potential to allow students to collaborate in new ways with their peers, to think deeply about audience, and to develop more authorial control over their writing and their public selves.

While the rise in access has pushed instructors to embrace technology, the shift towards integrating technology into the classroom has also created newfound concerns for instructors and researchers. In his earlier 2003 study, for example, Jeffrey T. Grabill examined composition classrooms and technology to focus on the direct relationship between different economic classes and their access to technology. Although Grabill (2003) observed that from 2000 to 2002 access to computers increased among all user groups, he also suggested that other gaps (like understanding how to use technology productively or understanding how to organize and sort large volumes of information) pose significant problems even as access increases. Others, like Michael-John DePalma and Kara Poe Alexander (2015) have noted that although many teachers integrate digital platforms into their writing classes, students often have difficulty adapting print-based knowledge of writing to new forms of multimodal composition. The difficulties mostly stem from a lack of examples, and also from assumptions that students make about multimodal writing, especially in regards to understanding audience and what constitutes the ‘public’. These difficulties mean, as Stephanie Vie (2008) notes, that instructors must further attend to the challenges that students face in building digital literacy. For Vie, this means incorporating specific technologies into the classroom that students use on a daily basis, but that they don’t often use in an analytical capacity—these might include online social networking sites, podcasts, wikis, or blogs (Vie, 2008).

More recently, Robinson et al. (2019) have provided a useful and extensive overview of how writing and composition instructors specifically use digital tools in the classroom, presenting scholars with both the positives and the negatives. Robinson et al. surveyed 382 college-level writing instructors about their current uses of digital technology in the classroom. By examining work from the early 1980’s to the present, this study provides valuable information for instructors who seek best practices for integrating digital tools into syllabi. Notably, there were several key findings that ultimately echo my own conclusions in this study—1) that current technologies often do not fit with the goals and learning outcomes that instructors desire in their composition courses; 2) that both instructors and students must set aside time to conquer the learning curves of new technology; and 3) that despite the extensive benefits to public-facing writing, using digital resources can also raise questions of privacy and audience.

These challenges that crop up when integrating technology into the classroom are thus in part why I chose to take up this study—to examine how students experience and perceive digital tools so that we, as instructors, can more smoothly integrate technology and writing practice. Our students’ immersion in technology is what initially inspired me to use annotation software; rather than asking students to write long-form responses, annotation software allows users to write quick notes, bring in digital media into their responses, and respond easily to their peers. For the purposes of this study, I chose to study how students experienced and used digital annotation software because it best connected with my FWS learning outcomes, which were to teach the basics of literary analysis, close reading, and communicating data in a logical manner (see Section 1.4 for a more in-depth list of the courses and learning outcomes). Above all, I wanted my students to dive deep into literary texts, locate the working parts of narratives, and use these details to collaboratively develop a larger argument. This requires students to recognize patterns, literary devices, and structure—and this is precisely where digital annotation software comes into play.

Among the many choices of digital tools, annotation software can be especially productive for the goals I outlined above because it facilitates this collaboration and interactivity. The history of annotation is a fascinating one, from medieval scribes who created elaborate marginalia to the individual modern reader scribbling in their course books (Jackson, 2001; Wolfe, 2002). In the medieval period, the margins of a text were often communal, in which an individual could discuss a text, ask questions, gloss important terms, and learn from previous readers. The margins in essence became a conversation between readers that could span across time and geographic space depending on who (or what community) owned the manuscript. After printing technology made texts more accessible, the nature of annotation began to change. Rather than a communal practice, annotation became more of a solitary effort in which individuals write on the single copy that they themselves own.

This change has continued into the modern period and into our classrooms—we ask students, for example, to engage with primary texts by reading and commenting on them as they work through a text alone. As a teacher of early

English literature, I encourage students in my syllabi to physically mark up their copies with notes and comments so that they can pinpoint specific sections of the text that interest them for our close readings. This has the dual benefit of encouraging them to delve deeper into specific lines and passages, and it also allows them to mimic the medieval practice of creating marginalia that we learn about within early manuscripts.

Li, Pow, and Cheung (2015) have even suggested that the act of highlighting a primary text can help students to better engage in critical analysis, creating a more holistic and in-depth understanding of primary information. This improvement comes specifically by helping students learn to both decode and encode language (Li et al., 2015; Nokelainen et al., 2005). One of the primary reasons for these findings seems to be that annotation software does not split the reader's attention between commentary and text. Nancy Kaplan and Yoram Chisik (2005) and Joanna Wolfe (2008) have noted that more traditional discussion boards or chat functions such as Blackboard or Moodle visually separate the primary text and the commentary so that learners must move between two different spaces, the text and the response screen—this task of switching in turn disrupts the reading process and makes it more difficult for learners to focus on specific details of the text and their own interpretations. Both studies, along with a similar study in 2001 by Joanna Wolfe and Christine M. Neuwirth (2001), and in 2002 by Wolfe (2002), found that creating annotations on the same visual plane as the primary text encouraged students to move beyond rote summary in order to engage in more critical thinking and analysis. The act of selecting, highlighting, and making connections across a text, as Li et al. (2015) and Wolfe's 2002 studies suggests, can perhaps most importantly help students create a concrete record of their thinking process as they read—this record can be accessed long after reading has taken place, thereby providing a way for students and instructors alike to analyze and reflect on the way they process information.

In addition to creating a sustained record of their writing, digital annotation platforms have also potentially created a new way for instructors to provide feedback to their students. In their recent work, Clark-Gordon, Bowman, Hadden, and Frisby (2019) provided an in-depth study regarding instructor perceptions of digital feedback. They found that among 215 college instructors, those who adopted digital feedback for students overall preferred this format because of convenience, clarity, and efficiency for detailed feedback (Clark-Gordon et al., 2019). While this study primarily examines platforms like track changes in Microsoft Word, Google Docs, and Canvas, new software that primarily allows for annotation—like the software examples I examine in this study—could similarly provide instructors with a convenient way of giving more extensive and more personal feedback. As Clark-Gordon et al. show, one of the primary draws of digital feedback is the connections that instructors can make with their students, and the potential for collaboration during the revision process.

This focus on collaboration and interactivity is in many ways the cornerstone of annotation research. Even though annotating the margins of texts has in many ways become a solitary endeavor, there is still room to return the process of annotation (at least in part) to a communal practice by using digital software. In a case study that analyzed how digital annotation effects collaboration and group dynamics, Li et al. (2015) also found that the highlighting function itself increased individual group members' contributions and resulted in more metacognitive activity among groups and higher assignment scores overall. Joanna Wolfe (2002) in particular has cited recent research that argues students appreciate and seek out annotations from other people that they deem to be helpful. In a 1997 study that examined how students choose textbooks at a campus bookstore, for example, Marshall found that students gravitated towards used textbooks that contained notes and annotations in the margins already (as cited in Wolfe, 2008, p. 298–299; Marshall, 1997).

Digital annotations, like the books at campus bookstores, allow students to comment directly on primary texts. In most systems, the marginalia that users create is shareable or visible to others, which in turn helps to create a collaborative environment that supports discussion (Wolfe, 2008). Imagine, for example, that students could even have access to a record of previous student annotations on course primary texts. This might in turn enhance class discussions, especially if instructors provided access to previous course annotations *after* the current course annotates a text themselves. As readers will see in the upcoming sections, the findings from Wolfe's study that suggest digital annotation is useful for collaboration are consistent with this present study of digital annotation below.

My study thus follows in the wake of other work in composition and rhetoric like Wolfe (2008) that has investigated the relationship between collaboration and digital tools like annotation software. For example, Jenna Sheffield's more recent 2015 study in *Computers and Composition*, which further demonstrates the importance of interactivity and reader commentary. Although Sheffield is examining digital commenting features in networked scholarship, her work, which cites studies by Teena Carnegie (2009) and Sally McMillan (2006) on interactivity, was instrumental in helping me think through modes of digital collaboration for students in this present study. While she does recognize several

difficulties that could occur from adding annotation functions to scholarly publishing (such as the potential for false information to be disseminated), she suggests from her findings that there are several features which can be added to increase the benefits, such as: 1) social media functionality where users have a profile and stated identity, 2) author responsiveness to establish conversation and interpersonal relationships, and 3) monitored and moderated annotation threads to establish a safe community (Sheffield, 2015). These findings, as I discuss later, helped further narrow down my choice of annotation software for the purposes of this case study.

In regard to methodology, I have structured this study similarly to several recent studies in education and composition studies. In particular, a report by Buzzard, Crittenden, Crittenden, and McCarty (2011) examined the differences in perception between instructors and students regarding the use of digital technology. They cite two major studies that were implemented by Cengage Learning, including one which surveyed 765 students about their experience of digital media in the classroom. This report by Buzzard et al. (2011), which specifically examined the survey methodology and the results of the Cengage studies, helped me to develop my own survey instrument, which focused on student perceptions and experience. The major finding of Buzzard et al. (2011) suggest that both students and instructors want to teach and learn from new technologies, despite issues of logistical failure, lack of training, and the potential for distraction. They also found that students both appreciate and want to use digital tools, especially when they can connect each lesson or skill with a needed skill in their own lives. I found the focus of this report and the Cengage studies on student experience to be particularly helpful when designing my own study, especially in deciding where and when to add digital tools into my syllabus and writing instruction.

Another study by Susanne Nobles and Laura Paganucci in 2015 examines how high school students perceive their own writing quality when using digital tools and online writing versus with pen and paper (Nobles & Paganucci, 2015). Overall, they found that students perceive their writing to be of a higher quality when produced online or with digital tools, and perhaps more significantly, that positive perceptions of digital writing tools seem to continue from grade school to high school and beyond. To obtain these findings, Nobles and Paganucci used a mixed methods approach by asking students to answer Likert Scale questions as well as short response questions. For this present study, I likewise developed a mixed methods survey in order to maximize the range of data collected; my findings, as I shown below, underscore Nobles and Paganucci's suggestions to continue adopting digital tools that foster positive perceptions with multimodal writing.

Like many of the studies that I have outlined above, this present study is ultimately interested in focusing on student voices and how they experience digital software in the classroom. Today, students have a copia of devices and technologies at their fingertips. They also have more choices than ever about how and where to spend their time learning—whether that is online, in the classroom, at home, in public, etc.). In their work on video games, for example, Lenhart and Madden observed that students prefer non-traditional forms of communication like text messaging, instant messaging, and social networking to traditional methods of e-mail and in-person communication (Lenhart & Madden, 2007). These are the students who come to fill the First Year Seminar classrooms at Cornell University—students who are deeply immersed in social media and interactive media within their own lives. Through annotation software that mimics social networks, I believe that instructors can better tap into the digital practice that our students use in their daily lives, which would in turn create a more holistic learning process in the writing classroom—specifically, as DePalma and Alexander (2015) note, through scaffolding digital media into low-stakes assignments and as Vie (2008) suggests, being transparent about *what* students will ultimately get from this digital resource.

Digital Annotations Platforms: A Select Survey

Instructors can now choose from several different technologies that all tend to focus on specific aspects of digital annotation, whether that is commenting via sticky notes on PDFs, collaborating with peers, or adding digital media into annotations. In her 2008 study, Wolfe argues that the biggest issue facing annotation software design is deciding where to position the annotations in relation to the primary text. She cites Zellweger, Regli, Mackinlay, and Chang (2000) and Cabanac, Chevalier, Chrisment, and Julien (2007), who completed studies of annotation layouts and user preferences in her analysis. Zellweger et al. found that users did not like annotations that crossed over the primary texts, including pop-up comment boxes and 'sticky-notes' (Zellweger et al., 2000). Cabanac et al., meanwhile, found that interlinear glosses tend to introduce confusion for users, especially as the glosses become more frequent and more complicated (Cabanac et al., 2007). As Wolfe (2008) notes, "aligned interfaces" that relegate the comments to the text's margins are currently the best design for annotation software because it is the least disruptive for users.

In designing this present study, I researched several leading annotation systems that could work for my learning outcomes, such as:

1. Diigo
2. Annotate
3. Hypothesis
4. Genius

All four of these software platforms are free for educators, which makes them good choices for both secondary and higher education. Diigo is a bookmarking platform that allows users to organize, tag, highlight, and annotate web pages online. Diigo annotations are displayed on sticky notes that pop up over the primary web page or text; users can make these comments private or public. Out of these four annotation platforms, Diigo seems to work best as an individual repository for web pages and links. Unlike Diigo, Annotate functions more like Google Docs in that it allows a group of set users to comment and edit documents that are posted online. This platform allows users to manage and store documents, share them with other users, and collaboratively markup texts. Users are able to highlight and edit texts, and annotations pop up to the right of the screen—one of the most exciting things about this platform is that users can individually select who in the group can see specific annotations and comments. This provides more flexibility in terms of privacy and security for students. In a classroom setting, this could also allow for rotating small discussion groups outside of larger classroom discussions.

Hypothes.is and Genius are similar in terms of design and annotation format—both of these platforms allow students to annotate any webpage online, and both feature annotations that pop up in large visible boxes to the right of the user's screen. These two platforms, in my opinion, have the best interface for ease of reading and user annotation, especially regarding the findings of Zellweger et al. (2000), Cabanac et al. (2007), and Wolfe (2008) above. Hypothes.is is compatible with PDFs that are available via scholarly databases, and also allow users to annotate in private groups. For both Hypothes.is and Genius, the annotations are stored on each company's server, and student annotations can be read by anyone that has the Hypothes.is or Genius browser and is logged into their Hypothes.is or Genius accounts.

Genius has stated that its goal is to “add line-by-line annotations to any page on the Internet,” and their privacy settings reflect this goal (genius.com/web-annotator). While they at one point developed a project called ‘Education Genius’, which would have provided more privacy settings for instructors, that project was ultimately scrapped. Their stated goal to annotate the entire web can therefore be at odds with an instructor's desire to keep student information fully private. Recent studies in the field have called for instructors to be more mindful of privacy concerns for our students as we continue to integrate new technology into the classroom. Scholarship has thus debated the ethical implications of using multimodal writing, critiquing the growing number of sites from Blackboard to Facebook that use tracking systems to tailor user experience (Beck, 2015; Beck et al., 2016; Beck, 2017; Vie, 2008, 2014; 2015; Amidon & Reyman, 2015; Hutchinson & Novotny, 2018). For Genius, even though the privacy settings are not ideal (see Section 1.9 for recommendations), instructors still have some options regarding privacy when using the Bookmarklet function. If instructor websites are password protected, the public cannot view the entire annotation that students make. Students can also sign up on Genius using a pseudonym that will anonymize their contributions.

In this present study, I chose to use Genius over the other three choices primarily because it is accessible for students, it uses an attractive aligned interface, and its design encourages students to collaboratively develop textual interpretations. By using Genius, students can annotate electronic texts that are posted to our course website, read peer annotations, and reply using any form of media with one click. In previous courses in which I integrated new software into assignments, I have found that design and accessibility are two of the most important criteria for choosing educational platforms. Because Genius was designed to mimic elements of social networking sites like Facebook and Twitter, this platform is beginner-friendly and easily accessible for students. In fact, many of my students were already familiar with the website, which initially gained fame as ‘Rap Genius’, a site that allows users to publicly annotate song lyrics. To my knowledge, there is not currently a tool as accessible and attractive, which also addresses the privacy concerns outlined above. In the methodology section below, I outline how Genius works as a platform, how I used Genius in five FWSs, and subsequently how I surveyed students about their experience incorporating this platform into their reading and writing practice.

First Year Writing Seminars and their Contexts

A typical FWS course enrolls up to seventeen students that come to the writing program from a range of departments, from English to Engineering to Agriculture and Life Sciences. These students are primarily freshmen, though occasionally there is a sophomore or junior who could be placed into one of the courses. FWS courses are all based around specific themes that each instructor chooses—within the English department, for example, instructors would assign literary texts and engage in class discussion that focused both on literary content and on the writing style of each author.

Across all FWSs, students must complete five to nine short essays and no more than seventy-five pages of reading per week. At least four of these assignments must go through a drafting and peer review process—instructors are also required to meet with students one-on-one at least once during the semester. One-third of FWS courses are taught by faculty, while the remaining two thirds are taught by graduate students. Overall, because of the range of topics and assignments that are given within these courses, FWSs give Cornell undergraduates a space to experiment with different genres of writing, to gain a sense of their own writing style, and to improve their clarity, argumentation, and control.

In this study, I integrated digital media and digital annotation software into 5 FWSs. Our goal in each of these classes was to examine the relationship between reading and writing; students thus spent extended time in class learning how to close read and learning how to create logical arguments. The learning outcomes in my course were threefold. At the end of the semester, students should have made progress with:

1. Critically analyzing and interpreting our readings. This includes recognizing and evaluating style, narrative structure, and literary devices.
2. Conveying ideas and arguments clearly and persuasively.
3. Collaboratively creating interpretations, and explaining connections between texts, ideas, genres, and media.

This is where the annotation software comes into play—in all five of these courses, students used Genius to annotate our texts in low stakes weekly assignments, replacing the traditional reading responses I have assigned in the past. As we saw above, annotation platforms are uniquely suited for introducing students to new techniques for reading and writing. When students are asked to comment on a text, I hoped that the act of annotating would encourage them to slow down throughout the reading process and to notice specific details rather than reading only for plot and comprehension. Perhaps most importantly, I also hoped that using Genius would create more dynamic discussions—students would be able to collaborate outside of the classroom so that our in-class discussions could be more holistic and inclusive.

Using Genius in the Classroom

In each of my FWSs, I first created a course website that housed course texts, documents, and relevant information. The course website within this study was custom-made and written in HTML, but Genius would work well with any website builder, including sites such as WordPress, Wix, and Squarespace. Genius functions through a bookmarklet apparatus which can be integrated directly into any created course website, though it is not currently able to be integrated into a course management site like Blackboard. To get students started on the first day, I asked them each to create a Genius ‘profile’ and screenname that keeps track of both their weekly postings and instructor feedback. In addition to password protecting my course website, I specifically encouraged my students to use pseudonyms if they were at all concerned with issues of privacy—I simply asked them to email me their screenname on Genius so that I could effectively grade their contributions. Next, I instructed students to drag the bookmarklet link to their bookmark bars. While Genius does theoretically work on any browser, it is most compatible with Google Chrome. Using this tool, students were then able to annotate any plain text that I posted to our course site by highlighting a word or sentence and annotating in the corresponding box that popped up to the right of the screen. Any annotations that a student made were then visible to his or her classmates—the annotations showed up for everyone as yellow highlighted text (see Fig. 1 and 2).

In all five FWSs, students were assigned weekly readings and asked to annotate our posted course texts once per week on average. They were asked to do two types of annotations throughout the semester: 1) annotate freely, marking questions or close readings as they saw fit throughout the text, and 2) answer specific questions that I posted throughout

Borges, 'Library of Babel'

By this art you may contemplate the variations of the 23 letters... The Anatomy of Melancholy, part 2, sect. II, mem. IV

The universe (which others call the Library) is composed of an indefinite and perhaps infinite number of hexagonal galleries, with vast air shafts between, surrounded by very low railings. From any of the hexagons one can see, interminably, the upper and lower floors. The distribution of the galleries is invariable. Twenty shelves, five long shelves per side, cover all the sides except two; their height, which is the distance from floor to ceiling, scarcely exceeds that of a normal bookcase. One of the free sides leads to a narrow hallway which opens onto another gallery, identical to the first and to all the rest. To the left and right of the hallway there are two very small closets. In the first, one may sleep standing up; in the other, satisfy one's fecal necessities. Also through here passes a spiral stairway, which sinks abysmally and soars upwards to remote distances. In the hallway there is a mirror which faithfully duplicates all appearances. Men usually infer from this mirror that the Library is not infinite (if it were, why this illusory duplication?); I prefer to dream that its polished surfaces represent and promise the infinite ... Light is provided by some spherical fruit which bear the name of lamps. There are two, transversally placed, in each hexagon. The light they emit is insufficient, incessant.

Like all men of the Library, I have traveled in my youth; I have wandered in search of a book, perhaps the catalogue of catalogues; now that my eyes can hardly decipher what I write, I am preparing to die just a few leagues from the hexagon in which I was born. Once I am dead, there will be no lack of pious hands to throw me over the railing; my grave will be the fathomless air; my body will sink endlessly and decay and dissolve in the wind generated by the fall, which is infinite. I say that the Library is unending. The idealists argue that the hexagonal rooms are a necessary form of absolute space or, at least, of our intuition of space. They reason that a triangular or pentagonal room is inconceivable. (The mystics claim that their ecstasy reveals to them a circular chamber containing a great circular book, whose spine is continuous and which follows the complete circle of the walls; but their testimony is suspect; their words, obscure. This cyclical book is God.) Let it suffice now for me to repeat the classic dictum: The Library is a sphere whose exact center is any one of its hexagons and whose circumference is inaccessible.

There are five shelves for each of the hexagon's walls; each shelf contains thirty-five books of uniform format; each book is of four hundred and ten pages; each page, of forty lines, each line, of some eighty letters which are black in color. There are also letters on the spine of each book; these letters do not indicate or prefigure what the pages will say. I know that this incoherence at one time seemed mysterious. Before summarizing the solution (whose discovery, in spite of its tragic projections, is perhaps the capital fact in history) I wish to recall a few axioms

Fig. 1. Genius annotation tool. When using Genius on a course website, when a line is highlighted, an 'annotate' button appears above the line to allow students to input comments.

the readings and also respond to their peers' answers. For both of these assignments, each student was asked to produce at least 2 annotations per night—this could include annotating their own line, or also responding to another student's post. In this way, students were encouraged not only to annotate on their own parts of the text, but also to respond to their peers' questions and thoughts.

While it can be difficult to have an interactive conversation on course management sites like Blackboard or Moodle because these sites are more static, Genius allows (and even requires) students to answer each other and collectively build an analysis of each text. Unlike Blackboard, this annotation platform provides space for easily incorporating multimedia, in which students may post text, images, videos, and any other media that can be linked directly on the site.

In Fig. 3, for example, one student has annotated George Luis Borges' 'Library of Babel', which describes an infinite library that contains every single book that has ever been written or that ever will be written on earth. In her annotations, my student was primarily interested in why the library is made up of a series of hexagons and whether the library in the narrative was truly infinite. She brings in outside information into her annotation; she has found a website that is based on the 'Library of Babel' as a narrative. The goal of this website is to create an algorithm that allows users to browse every possible combination of 1,312,000 characters, including lower case letters, space, comma, and period. It therefore necessarily includes every book that has ever been written and every book that ever could be—currently, the project contains all possible pages of 3200 characters, or around 104677 books. My student found this resource online and muses in her annotation about whether in the modern world this number is all that big, especially since we have super computers that could manipulate such data. Her post brought into our discussion another layer of complexity, allowing her to compare the Borges' seemingly impossible library with modern computer circuitry. In this way, the annotation software allows students to make new connections and to more easily bring outside material to bear on our texts.

Grendel's mother into her son. But *Wisen* mentions another persistent critical tradition surrounding Grendel's mother, one in which she is interpreted as inhuman, a beast, but more often a monster or demon. Helen Damico, for instance, has described Grendel's mother as "half-bestial",² and Elaine Tuttle Hansen calls her "evil incarnate".³ Martin Puhvel refers to Grendel's mother as "the ogress" and includes her in a tradition of powerful female demons.⁴ Setsuko Haruta, Alvin Lee, Kevin Kiernan, and Andrew Orchard all call Grendel's mother a "monster", even though the latter two recognize some admirable and heroic qualities in her.⁵ Others claim Grendel's mother to be some sort of perversion of womanhood;⁶ Jane Chance's assertion that **Grendel's mother is a sort of anti-queen**, an inversion of the peace-weaver and *ides*, is the best known and most widely cited of these.⁷

Some recent studies of Grendel's mother, however, challenge this attitude and have often concluded that the scholarly tendency to dismiss, condemn, or demonize her derives from misogyny and cultural expectations of women. Edward Burroughs Irving blames the systematic reduction of the mother on her sex, for example,⁸ and Christine Alfano attributes the tradition of the monstrosity of Grendel's mother to her unwomanly behaviour and to the supposition that she necessarily shares Grendel's evil nature: "She finds herself implicated in her child's monstrosity, as unchallenged assumptions subsume her maternal role within a son's identity".⁹ These assumptions are the equivalent of condemning Shakespeare's Queen Margaret as monstrous because her son happens to be Richard III—an accusation which most critics would recognize as unsupported by the text and unjust to boot.

Like Richard III, *Beowulf* does not support the conclusion that a mother of a monster is a monster herself. Grendel's mother certainly is constructed as *Beowulf*'s antagonist, but the poem does not depict her as a monster or even a villain in the modern sense of the word. True, she crosses gender lines and performs the functions of warrior, avenger, and king, all generally associated only with men, and she is certainly depicted as supernatural. Despite these qualities, however, neither the poem nor its characters demonize her or even criticize her actions; rather, she is presented as a noble and brave opponent and even as a somewhat sympathetic character. Far from calling her words for monsters, the poem calls her normal Old English words used for women, such as *wif* and *ides*. But translators and critics of the poem have consistently interpreted Grendel's mother as demonic, monstrous, and horrible, a reading which the Old English text does not support. Such readings reveal modern gender expectations of women in this literary genre: because Grendel's mother does not behave like *Wealtheow*, *Hygd*, or *Hildeburh*, whom scholars consider to be proper models of womanhood, Grendel's mother must be monstrous.

Fig. 2. **Highlighted student annotations.** Students can see at a glance where their peers have left comments for them to review. By clicking on the highlighted section, a box will pop up to the right of their screen.

Borges, 'Library of Babel'

may contemplate the variations of the 23 letters... The Anatomy of Melancholy, part 2, sect. II, mem. IV

hich others call the Library) is composed of an indefinite and perhaps infinite number of **hexagonal galleries**,
fts between, surrounded by very low railings. From any of the hexagons one can see, interminably, the upper
i. The distribution of the galleries is invariable. Twenty shelves, five long shelves per side, cover all the sides
r height, which is the distance from floor to ceiling, scarcely exceeds that of a normal bookcase. One of the free
narrow hallway which opens onto another gallery, identical to the first and to all the rest. To the left and right of
e are two very small closets. In the first, one may sleep standing up; in the other, satisfy one's fecal necessities.
re passes a spiral stairway, which sinks abysmally and soars upwards to remote distances. In the hallway there
faithfully duplicates all appearances. Men usually infer from this mirror that the Library is not infinite (if it were,
duplication?); I prefer to dream that its polished surfaces represent and promise the infinite ... Light is provided
cal fruit which bear the name of lamps. There are two, transversally placed, in each hexagon. The light they
nt, incessant.

he Library, I have traveled in my youth; I have wandered in search of a book, perhaps the catalogue of
v that my eyes can hardly decipher what I write, I am preparing to die just a few leagues from the hexagon in
n. Once I am dead, there will be no lack of pious hands to throw me over the railing; my grave will be the
my body will sink endlessly and decay and dissolve in the wind generated by the fall, which is infinite. I say that
ending. The idealists argue that the hexagonal rooms are a necessary form of absolute space or, at least, of
pace. They reason that a triangular or pentagonal room is inconceivable. (The mystics claim that their ecstasy
a circular chamber containing a great circular book, whose spine is continuous and which follows the complete
ls; but their testimony is suspect; their words, obscure. This cyclical book is God.) Let it suffice now for me to
ic dictum: The Library is a sphere whose exact center is any one of its hexagons and whose circumference is

helves for each of the hexagon's walls; each shelf contains thirty-five books of uniform format; each book is of
id ten pages; each page, of forty lines, each line, of some eighty letters which are black in color. There are also
ine of each book; these letters do not indicate or prefigure what the pages will say. I know that this incoherence
med mysterious. Before summarizing the solution (whose discovery, in spite of its tragic projections, is perhaps
n history) I wish to recall a few axioms.

GENIUS

FILTER BY All Annotations

Why hexagonal? This is also what I assume they look like.

edit delete pin to profile report abuse

Uptvpe

I read an interesting explanation of why the shapes are hexagons on the Library of Babel website. The structure resembles a beehive, with librarians occupying each cell, like bees in a honeycomb. "Bees have represented, throughout a vast history of thought, a society highly organized and hierarchize yet devoid of reason." This seems to be reflected by the library, which

5m

Fig. 3. **Example of a student annotation.** Once a student highlights text and clicks 'annotate', a box will pop up to the right. This particular student has embedded a secondary source to help explain our primary source.

We see this connection to secondary sources again in Fig. 4, where a student has embedded a link to a Forbes article during a discussion of the Old English poem *Beowulf*. This poem is set in early Scandinavia and focuses on the hero *Beowulf* who defeats a series of three monsters—Grendel, Grendel's Mother, and the dragon. This class read *Beowulf* over three weeks with a primary focus on the gender dynamics between the hero and his three enemies. This particular student in Fig. 4 was inspired to do research on Viking history to better understand the context of the poem. He posted

as monster.

Grendel's mother's monstrosity (or lack of it), *Beowulf* certainly represents her minine pronouns to refer to her, and it also calls her "wif" ("woman"), alone or in lb).¹⁶ She is also an "ides" (1259a), a mysterious word used only for women poem most obviously constructs this character as feminine in its continual 8b; 1276b; 1282a; 1538b; 1683b; 2118b; 2139b). Only women perform nply Grendel's mother, the poem continually reinforces her feminine identity. smale, and her identification as "modor" and "wif" indicate that her gender is, or

r, Grendel's mother performs many functions usually restricted to men. **The most** 17 As Chance notes, Grendel's mother not only fights, but fights in a manly way: .18 Those critics who discuss her fighting abilities judge her to be a poor warrior, Janes and subsequent flight from Heorot in lines 1255–301a, especially in s.19 But although Grendel's mother flees Heorot and eventually loses her battle effective and dangerous opponent. Her prowess often goes unnoticed, or is rception of Anglo-Saxon woman as peaceweaver; Grendel's mother is assumed per activity for women. But in the encounter at Heorot, her formidable skill is nd its results:

va bið mægpa cræft, wiggryre wifes be wæpnedmen, þonne heoru bunden i ofer helme ecgum dyhtig andweard scireð." (1282b–7b)

s the skill of maidens, war-terror of a woman, compared to an armed man, er, the sword stained with blood, good blades, cut the boar over the

ructs Grendel's mother (and women in general) as weak or ineffective,²¹ but the wess of men and women, but rather the terror that opponents feel when attacked

The screenshot shows a Genius annotation interface. At the top, the word "GENIUS" is displayed in a yellow bar. Below it, a filter dropdown is set to "All Annotations". The main annotation has the title "The most obvious of her masculine pursuits is warfare" and a user profile picture. The annotation text reads: "While it was definitely common place at the time for men to take part in warfare, there is some evidence that even in Viking culture there were female warriors with high respect among the soldiers." Below the text is a link to a Forbes article: "First Female Viking Warrior Proved Through DNA — Forbes". The article snippet says: "In the 1880s, a fascinating grave was discovered in the Swedish town of Birka. Chock full of weapons, gaming equipment,". At the bottom of the annotation, there are options to "report abuse", "Upvote", and social media sharing icons for Facebook and Twitter.

Fig. 4. Example of a student annotation. This particular student has added a Forbes article on Viking warriors to discuss gender in early medieval culture.

a 2017 article by Forbes that discusses recent archaeological findings from an excavated grave in Birka, Sweden. Archaeologists reevaluated the gravesite of a particular grave and discovered that the professional warrior who was thought to be male was in fact female. While scholars have long known that women fought beside men within this period, this finding has raised more questions about the role of female warriors within early Scandinavian culture—it has also made researchers question previous burials who were assumed to be male (Killgrove, 2017; Hedenstierna-Jonson et al., 2017).

By bringing in this article via our annotation software, this student added a new dimension to our class discussions. Students became more interested in the historical context surrounding *Beowulf*, and the article changed the way they thought about characters within the poem itself, especially Grendel's Mother. When I asked this student why he chose to do research and add this article in our annotations, he said that this is the type of work he always does before class discussions—he researches the text and looks for contextual articles. Before using the annotation software, he simply didn't have a venue to bring those secondary sources into class discussion.

The possibilities for enhancing class discussion via collaboration can be seen in Fig. 5, in which two students are discussing the character Iago from Shakespeare's *Othello*. These particular students are referencing a secondary source article by Janet Adelman that I asked them to annotate for a homework assignment—this is an article that uses psychoanalysis as a framework for discussing Iago's role within the play, and it can be challenging for first-year students because of Adelman's heavy use of theory. While I have taught this text before, I found that having students annotate the article before class completely changed discussion. Because students were able to pick out parts of the article that confused them, interested them, or irritated them, our class discussion the next day was more pointed and dynamic. In Fig. 5, both students muse on Iago's rationality within the play, especially in relation to his lack of humanity as a character. Using Genius allowed these two students to work through this passage within the original article so that, when we discussed this in class, they teamed up to answer my questions based on their shared annotations.

In each of the examples above, students are practicing new techniques for reading and analysis. When I did traditional reading responses in which students would post a paragraph on Blackboard or our course websites, the vast majority of students said they would read the entire text and then write a topic-based response. With the annotation software, the majority of students said that they read slower—rather than thinking generally about the text's narrative or its overarching meaning, they focused instead on specific lines and passages. By thinking about the details of each text before class, we were able to have more engaged discussions about themes and topics, with students bringing in specific examples from their annotations. Students would often reference annotations and also conversations that

ent" [1. 33]). Iago's "I" beats through the dialogue with obsessive insistence, claiming both self-sufficiency ("I am self" [1. 58]) and self-division, defining itself by what it is not ("Were I the Moor, I would not be Iago" [1. 57]), in fact proclaiming its existence and nonexistence: "I am not what I am" (1. 65). I, I, I: Iago's name unfolds from the ego; and the injured "I" is his signature, the ground of his being and the ground, I will argue, of the play. For the action of the play as though in response to this sense of injury: "Call up her father;... poison his delight" (1. 1. 75), like a stage manager, or like a magician calling forth spirits to perform his will; and with his words, the action

of the first scene models Iago's relation to the world that he calls up, for the play proper seems to arise out of "I": it is not only set in motion by Iago's "I" but becomes in effect a projection of it, as Iago successfully attempts to replicate it in Othello. Othello—and particularly in relation to Desdemona—becomes Iago's interior pain by replicating it in Othello. Othello has the presence, the fullness of being, that Iago lacks.⁶ Othello is everywhere in the kind of interior solidity and wholeness that stands as a reproach to Iago's interior emptiness and : if Iago takes Janus as his patron saint (1.2.33) and repeatedly announces his affiliation with nothingness ("I am nothing; I am nothing, if not critical" [2.1.119]), Othello is initially "all in all sufficient" (4.1.261), a "full soldier" (2.1.36), "virtue" (4.1.262) and "perfect soul" (1.2.31) allow him to achieve the "full fortune" (1.1.66) of possessing "Tell me what you need to spoil and I will tell you what you want," says Adam Phillips:⁷ the extent to which Iago's emptiness and solidity are the object of Iago's envy can be gauged by the extent to which he works to replicate his own Othello. Split himself, Iago is a master at splitting others: his seduction of Othello works by inscribing in Othello dangerous interior spaces—thoughts that cannot be known, monsters in the mind—which Othello seems to lack, n to the world of self-alienation that Iago inhabits;⁸ by the end, Othello is so self-divided that he can take arms ff, Christian against Turk, literalizing self-division by splitting himself graphically down the middle.⁹ Though Iago is e his victory, we might imagine him as invisible commentator, saying in effect, "Look, he is not all-in-all sufficient, g and full; he is as self-divided as I am."¹⁰

illusion of Othello's fullness and presence is also to shatter the illusion of his erotic power; his division from of all his division from Desdemona and from the fair portion of himself invested in her. If Cassio is any indication, ver is heavily idealized by the Italians:

ove, Othello guard, And swell his sail with thine own powerful breath, That he may bless this bay with his
Make love's quick pants in Desdemona's arms Give renew'd fire to our extincted spirits...." (2.1.77-81)¹¹

is intolerable: what begins as a means to an end (Iago creates Othello's suspicions about Desdemona to lo in order to replace him as lieutenant) increasingly becomes an end in itself, as Iago drives Othello toward a nactment of sexual union on the marriage bed, even though that reenactment will make Othello incapable of , position Iago initially seeks. The thrust of his plot toward the marriage bed, even at the cost of his own ambition,

The screenshot shows the Genius website interface. At the top, the word "GENIUS" is displayed in a yellow box. Below it, a filter bar shows "FILTER BY All Annotations". A student's annotation is highlighted in yellow, reading: "Othello has the presence, the fullness of being, that Iago lacks." Below the annotation, there is a profile picture of a student and a timestamp of "1 year". The student's text reads: "I find this theory (and in particular this paragraph) rather interesting. I'm sure everyone's met that one person who would rather make everyone else deal with their problems rather than fix them themselves. It gives Iago a sense of humanity that some other theories lack. While I will concede he has a sort of scripted (imagine that) cunning about him, I think calling him literally Satan, for instance, is a bit of a stretch." Below the text are options for "report abuse", "Upvote", and social media sharing icons for Facebook and Twitter. A second student's response is visible below, starting with "I agree. This is the first instance in which Iago is seen less of as an omniscient character and instead in a more humanly manner. By doing so, the reader is able to acknowledge a feeling of jealousy to understand where Iago's rage comes from. In creating this type of personality for Iago, his character then is considered highly irrational and immature, perhaps then describing Iago as having more of an animalistic quality than Othello."

Fig. 5. Example of student annotation. This figure demonstrates the collaborative possibilities that Genius brings into the classroom—two students here are engaged in conversation about *Othello's* villain, Iago.

occurred within the platform. Overall, using Genius allowed them to focus their close readings and dive deeper into each text, it allowed them to bring new secondary information into our discussions, and perhaps most importantly, it allowed them to have a single space where they collaborate and discuss with their peers outside of the classroom.

While it was obvious to me as an instructor why annotations were useful for students, I was interested in studying how they themselves perceived the differences between traditional reading responses and digital annotations. I was also interested in examining whether students thought bringing digital media into the classroom like Genius was worthwhile or helpful.

Surveying Student Experiences of Digital Annotation Software

In my experience teaching writing seminars, I have found that there is a large gap between my own skills and use of technology and my students' skills and use of technology—as Stephanie Vie (2008) and Sam Hamilton (2019) have suggested, this gap may be because instructors tend to believe students are already digitally literate when they come to class. I therefore created a survey to analyze how Cornell undergraduates experience the use of digital media in the writing classroom. In addition to asking them general questions about incorporating digital media and writing practice, this survey also asked students to discuss their experience with annotation software specifically. The survey was administered in class on paper, and students were given 10 minutes to complete their responses.

There were 59 students across five sections of FWS courses that took the digital media survey, making the response rate for this study 71%. Students who completed the paper surveys occasionally skipped questions or left questions blank, making the tally for certain questions lower than the overall number of completed surveys. Out of 59 students, 57 were freshmen and only 2 were sophomores—47% of these students identified as female and 53% as male. These students were from a range of departments, from Computer Science to International Labor Relations to Chemistry. The most prevalent major was Biology, and there were only 3 English majors in all five of my FWS courses.

The survey began by providing students with 6 statements about using digital media in their writing practice, which they responded to via a Likert scale (strongly agree, agree, disagree, strongly disagree). The 6 Likert scale statements included:

1. Incorporating digital media and writing makes it easier to communicate my ideas.
2. Incorporating digital media and writing produces a more creative final product.

Incorporating digital media and writing makes it easier for me to organize my ideas

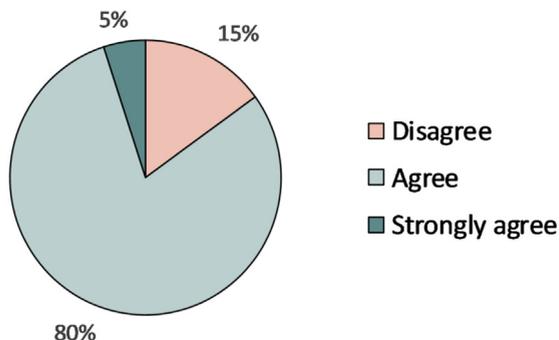


Fig. 6. **The effect of digital media on organizing and structuring ideas.** The majority of students reported that using digital media would make it easier to organize their ideas within their writing.

3. Incorporating digital media and writing distracts readers from my ideas.
4. Incorporating digital media and writing is too time consuming.
5. I do not have the technical skills to integrate digital media and writing successfully.
6. Incorporating digital media and writing makes it easier to organize my ideas.

Next, I asked students 3 questions specifically about their experience with Genius. These questions included:

1. Do you see annotation software as a useful tool for reading and writing? Why or why not?
2. Did using an annotation software change the way you close read? Why or why not?
3. Did you annotate after you read a text, or did you annotate as you were reading the text in real time?

In the following section, I will explore the response to each of these questions across the five FWS courses.

Potential Impacts of Incorporating Digital Media and Writing

First, I examined the results for the 6 Likert scale questions which explore potential positive and negative impacts of integrating digital media into the composition classroom. In Fig. 6 and 7, students were asked how digital media affects their ability to organize and communicate their ideas in writing. In Fig. 6, 80% of students agreed and 5% of students strongly agreed that using digital media within the writing process makes it easier to organize their ideas; only 15% of students disagreed and believed that digital media makes organization more challenging. Fig. 7 had similar results—83% of students agreed and 7% of students strongly agreed that adding digital media into the writing process makes communication easier, while only 10% disagreed. In both of these questions, no students strongly disagreed with these statements.

In addition to believing that digital media helped them organize and communicate their ideas, students also reported that it helped their creativity overall. In Fig. 8, for example, 37% of students agreed and 51% strongly agreed that incorporating digital media and writing produced a more creative final product than a traditional close reading analysis. Only 12% of students disagreed and no students strongly disagreed.

When asked to explain their overall impression of using digital media in the humanities classroom, students' qualitative responses gave further insight into the Likert scale statement in Fig. 8. One student said, "It's refreshing to take a different approach at writing an essay/creative piece." Along the same lines, another student said, "I think that the use of digital media or analysis can make the essay more relevant and enhance it overall." By 'enhance', this student and others who responded seem to reference how using digital media or digital software inspires users to look outside the classroom and think outside the box. One student, for example, specifically noted, "Digital media gives you access to so much info," referencing her use of annotation software to bring in outside information into class discussion and ultimately into her essays.

Incorporating digital media and writing makes it easier to communicate my ideas

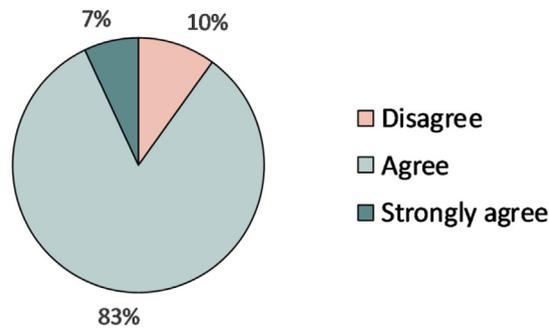


Fig. 7. **The effect of digital media on communicating ideas.** The majority of students reported that using digital media would make it easier to communicate their ideas in their writing assignments. Only 10% disagreed and there were no students who strongly disagreed.

Incorporating digital media and writing produces a more creative final product

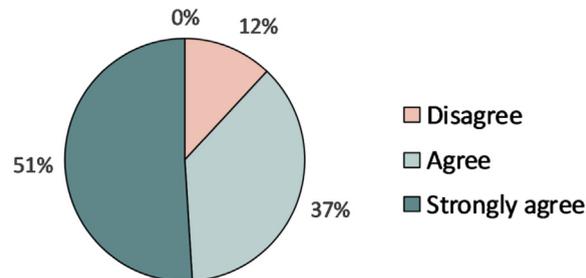


Fig. 8. **The effects of digital media on student creativity.** The vast majority of students reported that using digital media would help them produce a more creative final writing assignment.

Another student similarly stated that using digital media and software to help with the writing process is “just another way technology has developed our world with more tools and options at our disposal.” The inevitability of using digital media like annotation software to aid in the writing process was a theme among most of these Cornell student responses. Students on the whole believed that technology should be incorporated into composition classes because, as one student put it, “it’s important to stay modern and current.” We have seen this refrain over and over again in our own scholarship on digitality and writing, so it’s notable that our students believe the same thing (Clark, 2010; DePalma & Alexander, 2015; Lauer, 2014; Sheffield, 2015).

While most students were excited about the prospect of adding something new to the classroom, several expressed anxieties about changing any part of the reading and writing process. One student in this study, for example, notes, “I prefer to write traditional essays. It’s the way I’ve always written in the past.” The anxiety that comes with integrating yet another new skill into the already overwhelming process of writing is understandable. This student’s valid concern is also consistent with other recent studies, which state that students may still lack the skills to use technology productively even though access to technology has increased exponentially (DePalma & Alexander, 2015; Grabill, 2003; Vie, 2008).

Despite the perceived benefits regarding creativity and organization of ideas, I was thus also interested in what kinds of drawbacks students might perceive. In Fig. 9, only 39% of students agree or strongly agree that digital media distracts their readers from their ideas, while 46% disagree and 15% strongly disagree. In Fig. 10, 31% of students agree or strongly agree that using digital media in the writing process is too time consuming, while 54% disagree and 15% strongly disagree. Both of these questions, in comparison with the other Likert scale responses, are more polarizing. Although the majority disagree about potential drawbacks, there seems to be more of a split among students about whether digital media requires more time and focus than writing a traditional analysis on a primary source without digital components. As DePalma and Alexander (2015) suggest, instructors can again potentially scaffold

Incorporating digital media and writing distracts readers from my ideas

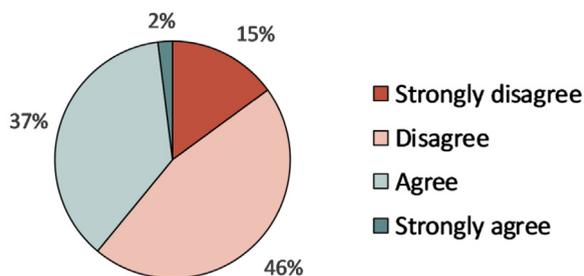


Fig. 9. **Digital media as a distraction.** The majority of students disagreed or strongly disagreed that integrating digital media into writing assignments would be too distracting for readers, though this question was more polarized than others.

Incorporating digital media and writing is too time consuming

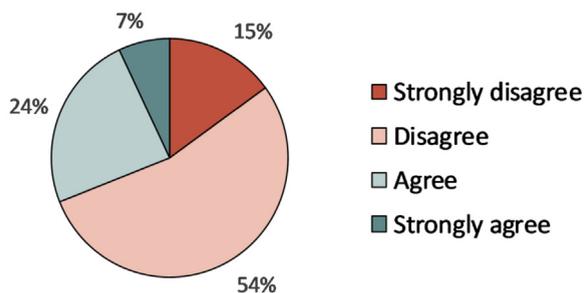


Fig. 10. **Perceived time and effort needed to use digital media.** The majority of students surveyed disagreed or strongly disagreed that using digital media in writing courses was too time consuming. In a follow up, several students commented that it would be easier than writing 'traditional essays'.

assignments, breaking them into smaller tasks, to negotiate this particular concern about time management. Instructors can thus integrate any technology or new media slowly into the curriculum, perhaps even initially using digital tools for pre-writing and working up to fully digital or multimodal essays as the semester continues. From the data above, it's clear that despite some potential negatives, most students recognized that using digital media, such as annotation software, has significant advantages in the writing classroom. And while students expressed some concerns, the majority (81%) of students reported that they disagreed or strongly disagreed that they still lacked the technical skills to integrate digital media into their writing by the end of the semester; only 2% strongly believed that they still needed more training to successfully integrate digital methods (Fig. 11).

The data thus suggests that the perceived learning curve for using digital media and digital methodologies is not too steep; these tools can be productively incorporated into syllabi even with first and second semester freshmen. This finding is consistent with many studies, including Buzzard et al. (2011); Clark (2010), and Nobles and Paganucci (2015). For this study in particular, I contend that it was in part because I incorporated these digital tools into low-stakes assignments first so that students could learn to use them without fearing any hiccups would drastically affect their grade—this approach is born out in DePalma and Alexander's 2015 study, which suggested that low-stakes assignments can help transition students into using new digital technology.

Student Experiences Using Genius

The use of Genius in these five courses corroborates the data above. In Fig. 12 below, for example, 67% of students believed that digital annotation software is a useful tool for analyzing and writing about primary sources. An additional 29% believe that it is sometimes useful for analysis and composition, while only 4% believed that it was not helpful in any scenario. In Fig. 13, I asked students whether the annotation software changed the way they close read throughout

I do not have the technical skills to integrate digital media and writing successfully

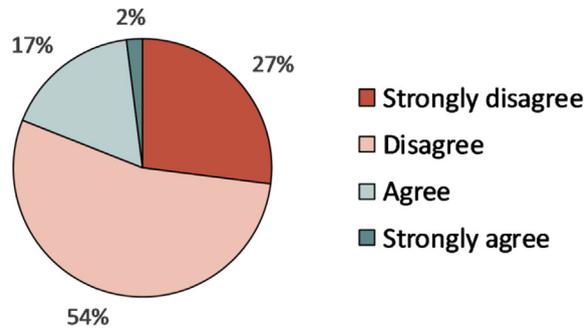


Fig. 11. **Student confidence using digital media in writing courses.** The majority of students disagreed or strongly disagreed that they lacked the skills to learn and productively incorporate new digital platforms into writing assignments.

Do you see digital annotation as a useful tool for writing and analysis?

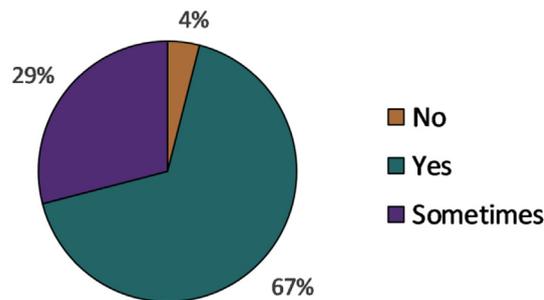


Fig. 12. **Digital annotation software as a useful tool for coursework.** The majority of students agreed that digital annotation software was a useful tool for writing and analysis, while others reported that it was useful depending on the theme or subject matter.

Did using an annotation software change the way you close read?

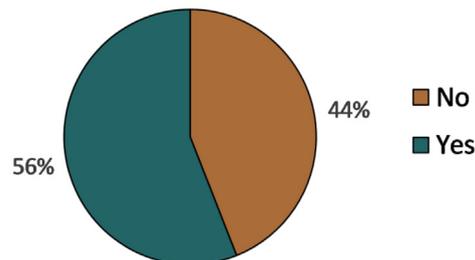


Fig. 13. **The effect of annotation software on student reading.** Student responses were overall polarized on whether annotation software changed their reading process.

our course. On this question, opinions were more polarized; 44% of students say that it did not change the way they close read, while 56% of students say that it did change their close reading style. After each of these questions, students were also encouraged to explain their reasoning with qualitative statements. For Fig. 12, most students who believed that digital annotation was productive for reading and writing remarked on its value for learning analysis. One student, for example, said that the software was “helpful for taking notes and understanding the passages”—he went on to say more definitively, “it forced me to read the stories.” Student responses on the whole agreed—most felt that annotation

software encouraged them to spend more time reading rather than skimming, though several said that they tended to focus most on passages that were already highlighted by other students. One of the most positive results of using digital annotation was the collaborative nature of Genius itself; the majority of students wrote that they liked being able to see their peers' thoughts outside of class. One student specifically said, "I liked that it gave us a chance to think about questions before class and have some confusing points cleared up by classmates before discussion." In the same vein, another student remarked, "I liked that I could read many differing ideas on the same passages that I was reading," but this student also went on to say that "there was less interaction between people than I thought." In-class discussions are particularly helpful because students are exposed to new ideas, and the annotation software helpfully allows them to engage with each other before we even enter the classroom. Unfortunately, the qualitative responses above suggest that students will need more structured discussion requirements for annotation homework. After all, most university students are used to using course management systems like Blackboard or Moodle that provide excellent resources for forum posting, or reading responses, but fewer resources for interactive discussion. On Blackboard, for example, users post to a specific forum that instructors create, but these forums are separate from the primary text and replying to peers can be challenging because users must click between forum postings. To get the full effects of collaboration, instructors could begin by mandating a certain level of discussion during digital annotation assignments where students must respond to at least two other peers. This could help set a precedent for more interaction among students that would continue throughout the semester. These findings and recommendations are furthermore consistent with past studies that suggest the ability of digital tools to increase student collaboration and interactivity if structured successfully (Sheffield, 2015; Nobles & Paganucci, 2015; Li et al., 2015; Wolfe, 2002, 2008). One student in particular noticed the differences between paragraph reading responses and digital annotation. After answering that she found digital annotation to be a useful tool 'sometimes' in Fig. 12, she goes on to say:

"I feel like [the annotations] act as good practice for close reading. . .but I also think it is good to do both, as paragraph responses are like a halfway step in taking the close reading and making it into a paper."

The idea of digital annotation as a 'halfway step' is a great insight—in this course, I introduced annotations as an entry-point into our texts. Students were encouraged to write down what they noticed and what interested them, to bring in sources, to discuss their thoughts with others, and to ultimately use these insights to help create an argument for their essays. Using digital annotation thus helps students to think of close reading as gathering data that they can consolidate later within their long-form writing.

In Fig. 13, students answered whether using digital annotation had changed the way they read, and the results were polarized. For those who replied yes, their responses tended to focus on the notion of reading in-depth. One student said, "it made me read more in depth with more curiosity," while another said "Yes. It made me analyze specific parts of a work instead of thinking of it as a whole." Other students focused on how easy it was to read and write at the same time using Genius—as the study by Cabanac et al. (2007) and Zellweger et al. (2000) showed above, students are more attracted to interfaces that allow annotations to pop up in the margins of the primary text, rather than interlinear glosses or sticky notes. When asked whether Genius changed her reading techniques, one student similarly replied, "Yes, it was easier to close read while reading rather than coming back."

While a slight majority of students said that annotation changed their reading process, there were students who found Genius less helpful. One student, for example, remarked "No, but it made me more attentive," suggesting that while her process did not change overall, the platform urged her to read more carefully. Another student, meanwhile, remarked, "Not really as I tended to annotate after doing the close reading."

This student response was a point of interest for me as I analyzed the annotation survey results. As we saw above, the results for whether annotation changed the ways students read were split (Fig. 13). After reading this student's qualitative response, I believe that there may be a correlation between whether a student believes their reading process has changed, and whether a student annotates while they are reading or after they have read a text. When asked whether they annotated the text as they read or after they read and formulated their ideas, 50% of students reported that they annotated the text in real time while reading. Meanwhile, 36% of students said they annotated after they had read the entire text, and 14% of students said they did a mix of both; for every student who tried both methods, they all also reported that their chosen technique depended on factors such as text length, subject matter, and how much we had discussed the text previously in class.

If I were to use Genius again in my classroom, I would encourage students to try annotating using both methodologies and then ask them to reflect on this process, which would in turn stimulate two distinct ways of reading; annotating

as they read could encourage students to think at the micro level by examining specific lines as they work through a text, while annotating after they read could encourage them to think at the macro level by recognizing more holistic themes or patterns that occur across the entire text. The combined use of experimentation and reflection is indicated in Sam Hamilton's 2019 article, "Reflection(s) In/On Digital Writing's Hybrid Pedagogy, 2010-2017," which analyzes 150 digital writing syllabi from across the US. Hamilton finds that although many instructors rely mostly on direct instruction for digital tools and trial-and-error experimentation from students, adding reflection into the pedagogical mix can help students better understand and connect with changing their writing process. In the case of my students, I thus believe that switching between experimentation and reflection could similarly provide them with more insight into their own reading and writing styles.

What's Next for Digital Annotation?

In the recent past, scholars have produced an astonishing amount of research about technology in the classroom. And although students use digital media frequently in their daily lives, the push to include it in writing courses is just beginning. Similarly, although studies like [Nobles and Paganucci \(2015\)](#) and [Clark \(2010\)](#) present compelling evidence that student perceptions of digital media are positive overall, we as instructors often still struggle to integrate these tools seamlessly into our classes for students. The goal of this study was thus ultimately to further open up conversations about digital media and writing by examining annotation software and student' perceptions of that software. While the number of participants in this pilot study is too small to draw broad conclusions, it does begin to hint at approaches or techniques that can help instructors integrate technology more successfully.

Similar to the [Buzzard et al. \(2011\)](#) report on digital technology in the classroom, I found that students overall wanted to use and learn more about digital tools. My students, like the students in the large Cengage Learning studies, were particularly interested in learning new tools that had specific purposes within the classroom—in other words, they perceived greater benefits from the technology if it was woven into specific assignments, and if I was transparent about why we were using the tools in class ([D'Aloisio, 2006](#)). As Nobles and Paganucci note, we know from scholarship that student perception impacts learning in composition classrooms—they suggest in particular that "a positive perception of and increased confidence in writing with digital tools. . . may lead to improved quality of student work," whereas negative perceptions "suggest areas of improvement in pedagogical practices" ([Nobles & Paganucci, 2015](#), p. 24).

From the data I collected, it is clear that the positives for using digital annotation in composition classrooms are many. I primarily used Genius to introduce students to critical analysis and to increase their collaboration inside and outside of the classroom. From collected surveys, I found that Genius succeeded in motivating the majority of students to read texts closer—most students reported that they read slower and focused on specific passages rather than reading only for comprehension or big-picture ideas. Students also reported that they enjoyed being able to read their peers' ideas before class discussions, and that they came to class more prepared to interpret our primary texts.

Moreover, because Genius collects user annotations into their personal profile, each student could create an online archive of their ideas throughout the semester. I encouraged students to read through their profiles as we developed arguments for essays, which in turn allowed them to see consistent themes or patterns that they were interested across our course texts. The annotations that I asked students to complete ultimately provided a safe space outside of the classroom for active engagement and participation. In particular, they could experiment with our literary content and their own writing styles, bringing in multimedia and testing out their ideas through peer collaboration.

While I would not hesitate to use annotation software again in my writing courses, I also have several recommendations from my experience as an instructor. First, I recommend that when integrating software like Genius, instructors explain to students in detail before each project begins how the digital platform could aid or affect their reading and writing. When I took the time to transparently discuss the direct benefits for their learning, I found that students were more likely overall to engage productively with the new tools. Second, I would recommend requiring a minimum level of participation for all students, whether that's requiring each person to write at least three annotations or requiring students to respond to at least two of their peers. If these requirements are laid out in the beginning of class, instructors can help set expectations for engagement that will continue throughout the semester. Over the five courses within this case study, I found that encouraging more participation from the very beginning of class made the tool more successful overall. These recommendations are consistent with other studies such as [Nobles and Paganucci \(2015\)](#) and [DePalma and Alexander \(2015\)](#), who both emphasize establishing rules of engagement and models of digital writing early in student use. And third, I would also recommend (at least initially) that instructors choose a digital platform that does

not have a steep learning curve. While new digital platforms are exciting, they can often be tricky for students to learn in a short amount of time without extensive support. This is why I originally chose Genius within this study because it replicates the social media experience in many ways that students would already be familiar with.

While the majority of students thought that integrating digital media like Genius into the writing classroom was worthwhile, this study also suggests that there is a need for better tools that are geared specifically towards education—tools whose goal is to help students write and interact with each other outside of class. After being asked whether integrating digital media into writing seminars is useful, several students responded no primarily because of technology glitches and irregular access to the platform. Because Genius works best with Google Chrome, for example, it was challenging for some students who used other browsers. There were also several times during the semester where the bookmarklet function that allows for annotation malfunctioned, whether through user or software defect. One student in particular noted, “currently, applications in FWSs are limited but as these programs progress they will become more useful.” Ultimately, I agree with the recommendation made in [Robinson et al. \(2019\)](#) that it would be beneficial for composition instructors to become engaged in the development of specific tools so that digital resources are born from pedagogical needs from the beginning.

As such, I hope to see a tool akin to Genius that is created specifically with education in mind in the future. My students appreciated the experience with Genius, but it's not an educational platform at its heart, having first been created for song lyric annotation. There are two functions in particular that would make Genius more ideal for secondary instruction. First, it would be useful if annotations on the platform could be made entirely private; currently, the only way to make student annotations private is to make the course website password protected, and even then the public can see the first few lines of their annotations on the student's profile page that is set up through Genius. It is true that students can simply create an account using a pseudonym if they wish to have more privacy, but adding a feature where instructors can lock down all student annotations from public view would be beneficial.

Second, it would be helpful if students could upload their own texts so that writing instructors can more feasibly use this platform for peer review. I see enormous potential for using digital annotation in peer review sessions outside of class. While there are other platforms like Google Docs, Annotate, and Hypothes.is that can be useful for peer review, my students particularly enjoyed the aesthetics and usability of Genius, as well as Genius' profile system that kept a clear and accessible archive of their work. Overall, the social-media aesthetics of Genius that are akin to Facebook or Instagram proved to be the strongest enticement for getting students onboard with learning new digital tools ([Sheffield, 2015](#); [Vie, 2015](#)). As I have hoped to show in this study, there seems to be significant potential for software like Genius given that some students find close reading difficult and unfamiliar. It is therefore my goal to collaborate with software engineers to build a tool like Genius that is created specifically with education in mind.

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