A Digital Literacy Initiative in Honors: Perceptions of Students and Instructors about its Impact on Learning and Pedagogy

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Researchers acknowledge the necessity of acquiring digital competencies to participate adequately in society (Ala-Mutka; Boyles; Cobo; Davies; Littlejohn, Beetham, & McGill; Teske & Etheridge; Tryon; Warf). Although the development of digital competencies has become increasingly important in higher education, integrating digital literacies in the college classroom has occurred at a slow pace. Honors programs and colleges represent one area of the academy that typically values a more traditional approach to skill development while resisting technology. My research study describes a digital literacy initiative in the Georgia State University Honors College, a large urban research university, and explores its perceived impact on teaching and learning. The study examines the activities introduced in the classroom and various disciplines, and it seeks to determine if the initiative's goals were met. This study does not attempt to make any sweeping claims about whether digital literacy should be a primary focus of honors education; rather, its purpose

is to discover how adapting pedagogy to include digital competencies might meet the objectives of undergraduate honors education. The research question asks how the intentional inclusion of digital competencies into the honors classroom affects learning and pedagogy, with the goal of providing a model for other honors programs and colleges seeking to implement and evaluate similar programs.

DIGITAL LITERACY AND HIGHER EDUCATION

The current climate of digital literacy development in higher education provides the context for examining the status of digital literacy in the honors community. The term "digital literacy," introduced in 1977 by Paul Gilster, is pervasive in society. Technology has become an integral part of a student's life, but digital competencies are not always introduced in higher education classrooms. With the analogous terms "computer literacy,' "information and communications technology (ICT) literacy," or "digital competence" (Nelson, Courier, and Joseph), a simple Boolean search of digital literacy returns a multitude of definitions that are abstract, technical, and pragmatic in nature (Joint Information Systems Committee; Media Awareness Network; New York City Department of Education). One definition from a report by the European Commission describes digital competencies as follows:

> knowledge, skills, attitudes (thus including abilities, strategies, values, and awareness) that are required to use ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socializing, consuming, and empowerment. (Ferrari 43)

The range of definitions underscores the complexity of attaining digital skills.

As a result of this complexity, digital literacy development is proving a challenge in higher education in the United States (Jeffrey et al.). The low level of development is disturbing when major governing bodies, such as the U.S. Department of Commerce, acknowledge the necessity of digital literacy for today's jobs and for taking advantage of educational, civic, and health advances. The literature cites several possible reasons for the lag in developing digital literacy at the college level: instructors' unwillingness to adjust their pedagogies (Schmidt), overestimation of students' ability to use technology to solve business and real-world problems (Murray & Perez), students'

illusion of knowing and overconfidence in career readiness (Hart Research Associates), and issues of access and self-efficacy (Jeffrey et al.).

In a 2014 study, Murray and Pérez used an exam to evaluate the digital competency of graduating seniors from a variety of majors in a capstone course. They collected data from four semesters, and the results showed that only 12% of students answered 80% of the questions correctly. The study results elicited a mantra by the researchers: "exposure does not equal understanding" (95). Students may regularly interact with certain digital tools, but more often than not these interactions do not translate to comprehension, critical thinking, and problem-solving. Although teachers should not use technology just for the sake of using it, they should use technology to advance learning and teaching by developing skill sets among both students and instructors. The development of digital competencies, however, will not happen naturally.

DIGITAL LITERACY IN HONORS PROGRAMS AND COLLEGES

Honors programs and colleges, like higher education as a whole, have been slow to incorporate digital literacy into the curriculum, and often the pace has been deliberate. Mariz eloquently summarizes the division between thought and practice in the use of technology in honors:

> For some this electronic revolution threatens to undermine established values and traditional academic practices, while for others it represents unprecedented ease and access to information with even greater benefits on the horizon. . . . Both faculty and student opinions of the electronic revolution seem divided: proponents vigorously promote the virtues of this brave new world of culture and research while adversaries see only disruption, degradation, and trivialization in its wake. (17)

Some faculty and administrators in the honors community view technology as a barrier to positive student development and are apprehensive about using technology in the classroom. Alger acknowledges that digital solutions change the landscape of learning and teaching, and he prefers learning environments that inspire students through mentorship and peer engagement. Some instructors believe that going digital will perpetuate passive learning and place students in isolation by cultivating a myopic view of the world (Badenhausen).

On the other hand, supporters of integrating technology into the honors classroom acknowledge its usefulness in moving students from passive to active learners. Students can use technology to discover information on their own that in the past they got only from instructors (Kelleher & Swartzlander). In her article "Building a Better Honors Learning Community through Technology," Johnson recognizes the value of leveraging technology to create a more dynamic learning experience in honors. Johnson states that she has used blogs, wikis (online collaborative workspace), and Wordle (a word cloud generator) in the classroom without compromising the integrity of the course.

Some instructors have recently incorporated technology into their classrooms (Corley & Zubizarreta; Doherty & Ketchner; Frana; Scott & Bowman). Corley and Zubizarreta, for example, have reported on the use of electronic portfolios in the honors program at Minnesota State University, Mankato. During the program's 2008–2009 curriculum redesign, the faculty agreed to replace honors theses with electronic portfolios as honors capstone projects. The objective was to place more focus on competencies that included demonstrable leadership, research, and global citizenship. The faculty selected electronic portfolios as the tool to carry out those goals because of its storage capabilities, adaptability, and flexibility. Preliminary results demonstrated the usefulness of electronic portfolios in providing real-time updates of students' progress.

THE DIGITAL LITERACY INITIATIVE

Although the honors community is dedicated to innovation, Johnson wrote in 2013 that it remains divided on how or if technology fits into the inherent features of honors courses. The Georgia State University Honors College sought to answer the questions "how" and "if" by partnering with the GSU Office of the Chief Innovation Officer (OCIO) to pilot an initiative that intentionally integrated digital literacy skills into honors courses. The mission of the initiative was to teach students to leverage digital competencies in solving complex issues, provide students with access to technology, and enhance pedagogy through the use of technology. The honors college was an appropriate foundational group for the university's Digital Literacy Initiative (DLI) because it is the kind of incubator for pedagogical innovation recommended in National Collegiate Honors Council's Basic Characteristics of a Fully Developed Honors College. Also, the honors college offered a cohort of students who exhibit an advanced understanding of the skills needed for

success, faculty with an affinity for instructional innovation, and small class sizes conducive to a valuable digital literacy experience.

The initiative took place during the 2015–2016 academic year. The OCIO provided instructors with the resources to include technology purposefully in their classrooms. For example, instructors had access to course-specific hardware, software, and curriculum design ideas. In turn, the instructors provided students opportunities to develop digital competencies within their courses. The courses aimed to provide a "distinctive learning environment for selected students," which is part of the NCHC's 2013 "Definition of Honors Education." Honors students received a lightweight laptop to use for the year if they needed one because access to a device was pivotal to the success of the initiative and some students could not afford to purchase one. Even though all honors students were eligible to participate in the initiative, incoming honors students were the group of interest because the majority of DLI courses cover classes that are typically taken by students within their first two semesters at the university.

The university population consists of a substantial number (26%) of first-generation college students, mostly from lower- to middle-class families. Nationally, these socioeconomic groups face unique challenges, including a growing digital divide between them and their wealthier peers (Cohron). Of the undergraduates at the university, 58% receive Pell Grants, and 88% are awarded need-based scholarships. The honors college reflects these demographics. Honors students were informed about the initiative through email and at the mandatory new student orientation sessions. Students received a software tutorial when they picked up a laptop.

Faculty members were recruited to participate in the initiative through a call for proposals to apply for the Digital Literacy Innovation Fellowship. Eligible instructors included those who taught a three-hour, stand-alone, honors course in fall 2015 or spring 2016. Participating instructors were asked to restructure their curriculum to include digital competencies for their field in order to aid students in developing digital skills for post-graduate success. Participating faculty received $3,000 in professional development funding to be used for graduate student assistance, conference attendance, travel, or other professional expenses. They also received help in developing course materials, support from a community of participating peers, and instructional support.

For the initiative to reach its stated goals with a group of this size, campus-wide support was essential. The primary stakeholders were the GSU

Honors College, the Office of the Chief Innovation Officer, and the Center for Excellence in Teaching and Learning. The digital literacy planning committee included twenty-five to thirty professional staff and faculty.

METHODS

Participants

Participants were honors students (N = 60) and instructors (N = 8) at GSU who participated in the program for fall 2015. Survey submissions yielded a 30% and 80% response rate, respectively. Student participants included 34 females and 26 males, with 98% between the ages of 18 and 24 and 2% between the ages of 25 and 34. The ethnicity of student participants consisted of 50% Caucasian, 22% African-American, 18% Asian, 7% Hispanic, and 3% other. Most students (75%) were pursuing majors in the College of Arts and Sciences; other students represented the J. Mack Robinson College of Business, the Andrew Young School of Policy Studies, and the College of Education and Human Development (17%, 5%, and 3% respectively). Five colleges serve the undergraduate population at the university. Students from the Byrdine F. Lewis School of Nursing and Health Professions did not participate in this study. Student classification consisted of 48% freshman, 38% sophomore, 7% junior, and 7% senior.

Instructor participants were all from the College of Arts and Sciences with an average of fourteen years of university-level teaching among them; the highest was thirty years and the lowest was six. Half of the instructors reported that they had not taught a course that intentionally incorporated digital competencies before the initiative. Instructor academic rankings consisted of 38% associate professor, 25% senior lecturer, 25% lecturer, and 13% professor.

Materials

The digital literacy framework adopted for this initiative (see Appendix A) is based on previous models of learning outcomes (Appel; Belshaw; Joint Information Systems Committee) and guided the construction of survey items. Two separate surveys were designed for students and instructors to determine the extent to which the DLI affected learning and pedagogy in honors courses (see Appendices B and C). The surveys sought both quantitative and qualitative data.

Procedures

Fourteen DLI courses were offered during the fall 2015 semester, as shown in Table 1, and taught by eleven instructors (one instructor taught three courses and one taught two courses). Table 1 presents each digital literacy course offering with information about available seats and actual enrollment. During student registration, each class was labeled as being a part of the Digital Literacy Initiative in the comments section of the registration screen.

After the Institutional Review Board granted approval and participants were invited, the study included the 202 students and 10 instructors. The number of students who participated in the study differs from the 237 enrollment figure because some students registered for more than one DLI course. The Chief Innovation Officer was a DLI instructor, but he was excluded from the study to avoid bias, which reduced the chosen sample for instructors from 11 to 10. Students were asked to take part in the study through email, the

TABLE 1: FALL 2015 DIGITAL LITERACY COURSE OFFERINGS (GROUPED BY DISCIPLINE)

Course	Seats Available	Enrollment
Honors Advanced English Composition	20	20
Honors Advanced English Composition	20	20
Honors Advanced English Composition	20	13
Honors Survey of World History to 1500	20	13
Honors Survey of U.S. History	20	11
Honors Freshman Seminar: Finding a Satisfying Career	17	17
Honors Freshman Seminar: The Emotional Life of Your Brain	17	17
Honors Freshman Seminar: 21st-Century Leadership	17	17
Honors Freshman Seminar: Grimm: Fairy Tales and Pop Culture	17	17
Honors Colloquium: How We Think	17	17
Honors Calculus of One Variable I	25	21
Honors Calculus of One Variable II	24	22
Honors Multivariate Calculus	25	17
Honors Introduction to General Psychology	20	15
TOTAL	279	237

honors college's weekly newsletter, the honors college Blackboard page, and flyers around the honors college. Instructors were invited through email and also in person at biweekly DLI instructor coffee hours.

The study included quantitative and qualitative data analysis because methodological pluralism can aid in the development of robust insights (Venkatesh, Brown, & Bala). Likert scale ratings on the student survey were analyzed using median averages for each item to determine the presence of significant group differences. Table 2 shows the categorization of similar courses by discipline and the number of students who participated in the study and were enrolled in those courses. Instructor survey data were analyzed using cross-tabulation to view differences among groups by the frequency of ratings. Open-ended questions were analyzed differently on both surveys because of differences in sample size. For the student survey, the Computer Aided Qualitative Data Analysis Software (CAQDAS) Nvivo was used to explore collective thoughts and ideas from student responses. The analysis software was used to enhance the reliability of the qualitative analysis. The size of the instructor sample did not warrant a CAQDAS, and non-thematic comments provided further insight on how instructors perceived the impact of the initiative.

RESULTS

Overall, students and instructors reported that the initiative had a positive influence on their learning and teaching. Student and instructor ratings on the Likert scale items and responses to open-ended questions offer insight into the positive impact and challenges that may accompany incorporating digital competencies in honors courses, leading to recommendations for meeting DLI's objectives and maintaining the integrity of honors education.

TABLE 2: FALL 2015 DIGITAL LITERACY COURSE OFFERINGS (GROUPED BY DISCIPLINE)

Course	Study Participants Enrollment
English	26
History	9
Honors Seminars and Colloquium	31
Mathematics	15
Psychology	7

Quantitative Analysis

Cronbach's alpha for the nine items on the student Likert scale was .93. The sample size for instructors does not meet the requirements for the reliability analysis. Figures 1 and 2 show the average mean for Likert-scale items on each survey. Participants were asked to rate each statement on a 5-point Likert scale, with the following options: strongly agree, agree, neutral, disagree, or strongly disagree. Students rated highest the item about the course's helping them create digital solutions to complete tasks in class or at work (4.38 out of 5). Students rated lowest the item asking about the DLI course as an aid in locating and purchasing digital solutions when needed (3.52 out of 5). The instructors rated highest the item about the initiative's accomplishment of its goal to enhance students' digital competencies (4.88 out of 5) and rated lowest the item about the initiative's positive influence on their teaching effectiveness (4.00 out of 5).

For student data, a Kruskal-Wallis (nonparametric) test was conducted to examine any significant differences in Likert-scale items across the disciplines. The test uses median averages to compare variances of ordinal data. Disciplines, grouped into five categories for the analysis shown in Table 2, yielded no significant differences ($p < .05$). The analysis treated all responses as independent samples. Of the students participating in the study, 92% rated their experience as excellent or good. For instructor data, a cross-tabulation was conducted based on years of teaching (groups: 6–8 years, 10–12 years, and 30+ years) and frequency of ratings by groups. Individually, all items were rated 3 or higher, and items 6, 8, and 9 were rated 4 or higher by instructors (see Appendix C, Section 2).

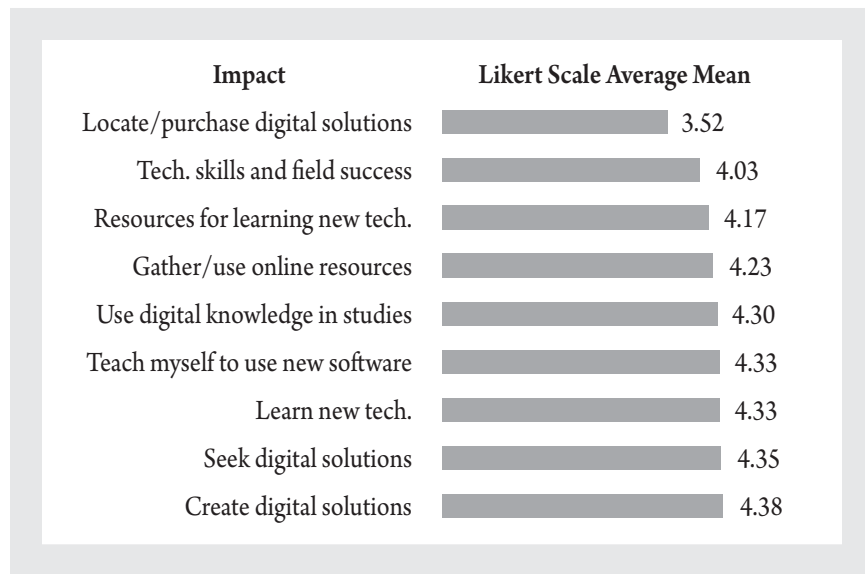## Student Qualitative Analysis

Student comments about their course experience revealed that the initiative had a positive impact on four distinct areas: 1) perceptions of the learning experience, 2) creating digital solutions and problem-solving, 3) perceptions of instructional knowledge and support, and 4) access to technology. Their commentary both supports the idea of introducing digital literacy to honors education and indicates potential improvements of future initiatives.
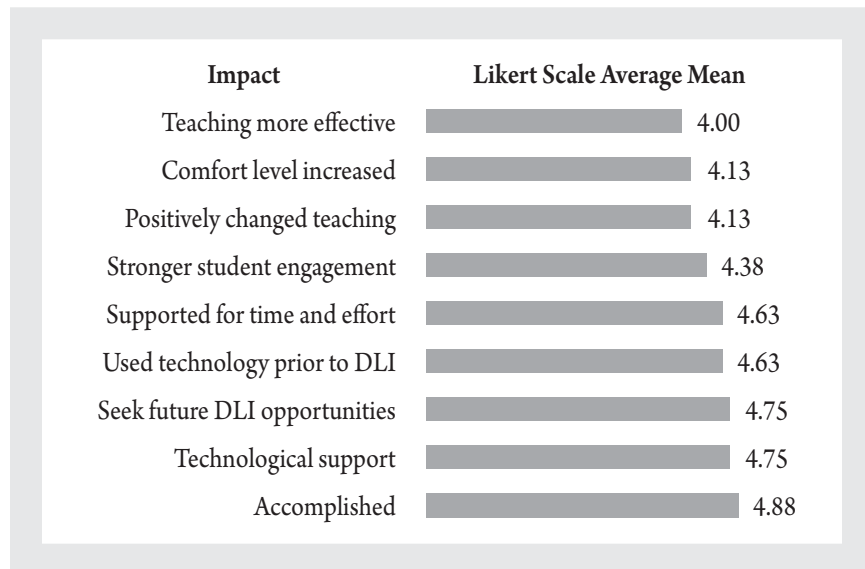
Enhanced Learning Experience

Although technology in the classroom can be a distraction when its presence becomes a barrier to student engagement rather than a catalyst for

learning, most students did not believe that the technology posed any distractions. On the contrary, students were aware of the DLI skills acquisition and

FIGURE 1: STUDENT PERCEPTION OF THE IMPACT OF THE DLI ON LEARNING

Impact	Likert Scale Average Mean
Locate/purchase digital solutions	3.52
Tech. skills and field success	4.03
Resources for learning new tech.	4.17
Gather/use online resources	4.23
Use digital knowledge in studies	4.30
Teach myself to use new software	4.33
Learn new tech.	4.33
Seek digital solutions	4.35
Create digital solutions	4.38

FIGURE 2: INSTRUCTOR PERCEPTION OF THE IMPACT OF THE DLI ON PEDAGOGY

Impact	Likert Scale Average Mean
Teaching more effective	4.00
Comfort level increased	4.13
Positively changed teaching	4.13
Stronger student engagement	4.38
Supported for time and effort	4.63
Used technology prior to DLI	4.63
Seek future DLI opportunities	4.75
Technological support	4.75
Accomplished	4.88

its application to future educational endeavors. Student comments indicated the value they saw in the DLI experience, as in these two examples:

> I enjoyed it and definitely preferred it to my traditional classes. I learned to use programs and software that will become invaluable tools in the future.

> My digital literacy class has been one of my favorites since my time here due to its relevance. The importance of the skills learned is ever increasing, and this initiative is very up to date.

Although most comments were positive, some students provided suggestions to enhance the learning experience. Some students focused on their lack of familiarity with the technology, feeling that instructors should have taken the students' level of technological skills into consideration when assigning projects, e.g., "Assume that the students know nothing and give trivial easily doable assignments to promote familiarity with the new software." Another student felt that the course relied too heavily on digital skill attainment: "It should not be advertised as an English class because the entire class was focused on building a website." A student in one of the math courses expressed similar sentiments:

> If it were just used to demonstrate concepts, not being graded at a test level on how well you could use those products, it would have been fine. I think it weighed too much on our grades for something we've never touched before, and since the software we used didn't work the way that the subject worked. For example, we used Mathematica and the syntax for Mathematica was probably the worst I've seen, and the learning curve was way too high, especially if you were taking 17 credit hours while commuting 3 hours a day, but it was a good way to visualize problems and have a deeper understanding of what each problem was solving.

Creating Digital Solutions and Problem-Solving

At the core of honors education is the creation of environments where students can critically analyze problems and create innovative solutions. Technology is one way honors students can leverage resources to perform more efficiently in their given field as the following comment reveals:

> The Digital Literacy courses were very beneficial to my overall academic career. I learned a lot about mathematical and computational software that I could use to find answers to calculus problems (i.e., Wolfram Mathematica and Desmos). We were able to create presentations online and share them with our classmates using Air Media. The Digital Literacy Program was a great way for me to spend my freshman year.

Other students felt that their DLI course made them realize "how much work could be expedited with digital assistance" and how the software introduced in those courses "helped visualize problems (3D graphs, etc.)." Also, quantitative data showed that students felt confident about seeking and creating digital solutions to complete tasks in class or at work.

Instructor Knowledge and Support

> A student in an advanced English composition course commented:

> I was nervous about having to incorporate digital literacy in my course work, but it went well. My professor always made sure we understood and had the knowledge and skills to complete any digital assignment given and was available to give extra help when needed. The digital assignments complemented the course schedule and did add to my learning.

Most of the students who participated commented on the high level of support they received from the instructor and the knowledge the instructor brought to the course. They were especially appreciative of the "melding of [course] concepts and digital literacy concepts into one cohesive and interesting course" and their newfound abilities to use software like Photoshop and Movie Maker as professors "made incorporating technology into the class so seamless."

Although most students had positive comments about instructor knowledge and support, a few mentioned negative experiences. Students stated that one of their instructors "didn't seem to have much digital literacy himself so it was hard learning from someone who was learning at the same time." Another student suggested that instructors "should be evaluated on their own personal digital literacy" before teaching one of the courses.

Access to Technology

Participants in the initiative were loaned a laptop for the 2015–2016 academic year to use in their DLI courses. Of students participating in the DLI, 79% chose to receive a laptop (160 out of 202). Students might have elected to obtain a laptop because they did not own a personal computer, the university-provided laptops had better functionality, or they simply wanted a new device to use for the year. One student listed financial reasons for receiving a laptop:

> I strongly advise having some kind of leverage that would encourage students to maintain their grades at high standards. For example, telling students that if they meet a certain GPA by the end of the semester, they are welcome to keep the laptop. This was such a big help to me, and I wish I could have kept this laptop. I have never had a true laptop before, and my family doesn't have the financial aid to help obtain a laptop for me like this one. Although it GREATLY helped me this year, it will be absent my next and I hope that for future students this can change.

Another student offered solutions for students to maintain their laptops at the initiative's end:

> I think there should be a way in which someone could do volunteer work or do anything extra in order to keep the laptop for those that are financially struggling.

Students also reported that having access to a laptop dramatically improved their ability to complete coursework, expand their computer skills, and organize their work.

Instructor Qualitative Analysis

Instructors were asked to discuss how they incorporated technology in their course as well as their relationship with their instructional designer and their overall experience. Table 3 presents data collected from instructors about the software used in their courses, revealing that a variety of software was used in the classroom to improve learning and introduce students to tools that could enhance future academic and professional performance. In most cases, instructors gave examples of products used in the classroom; in

TABLE 3: MOST USED DIGITAL TOOLS IN DLI COURSES

Product	Description	Product uses in course
Air Media	A media streaming and live conversion application that allows users to share data across multiple platforms wirelessly.	Students shared work from their computers during class for peer review.
Audacity	An open-source multitrack audio recording and editing program	Students recorded and edited sound to accompany videos and animated slide shows.
Desmos	An online graphing calculator that incorporates digital mathematics activities.	Students interactively visualized calculus concepts and observed how variables change the graphical representations of formulas.
Edublogs	Blog used for educational purposes, which provides a fully customizable WordPress platform.	Students displayed projects on their blogs and portfolio items; collaboratively and independently, particularly in English composition courses. Projects were either password protected and only visible to class members or the public.
Mathematica	A computer software that allows users to calculate and visualize the solution to mathematic, physics, and engineering problems.	Students constructed models defined through higher-level calculus equations. For example, students sought to answer questions like "What does the shadow look like for a square-shaped object when the light source is positioned on the horizon?"
Photoshop	Digital image-editing software.	Students created visual media. For example, a Photoshop Remix assignment in a composition course asked students to juxtapose two images to articulate a complex idea about pop culture.
PowerPoint	Software for presentation slides and animations.	Students created slide shows with animation on individual slides, accompanied by audio recording and edited in Audacity.
Sway	Web software used to create websites.	Students created interactive widgets within the Blackboard platform and developed papers with integrated charts, videos, and images.

Tableau	Data visualization software.	Students analyzed raw data to set up their displays. For example, students visualized historical data from the National Lynching database to show concepts and demographics of affected geographical areas.
Timeline JS	An open-source tool that allows publishers to create quickly and easily interactively, media-rich timelines.	Students created timelines that enable users to interact with their research. For example, timelines were created by news coverage of the AIDs epidemic in a local newspaper, starting with a primary source. Another example includes analyzing the history of a word by creating a timeline of the evolution of its use and meaning.
Voice Thread	An interactive collaboration tool that allows users to add commentary through a variety of media tools.	Students in a composition course used time-based visual and audio annotations to provide analysis of graphics. For example, students analyzed the rhetorical elements of vintage cigarette ads.
Windows Movie Maker	Video editing software.	Students produced video projects, such as in Biology or Pre-Calculus, and provided a video summary of a concept from the course.
WordPress	Web software used to create websites.	Students created their websites. They were able to share information and embed or attach artifacts (e.g., YouTube video, audio, pdf, etc.).
Zotero	Data management tool that allows users to gather, organize and analyze sources for research. Mendeley is a similar software.	Students compiled resources in the form of journal articles, news articles, etc, to use for assignments and projects.

*Other products used included **Brackets** (open-source code editor for web designers and front-end developers), **Omeka** (open-source web-publishing platform for the display of library, museum, archives, and scholarly collections and exhibitions), **Twine** (open-source tool for telling interactive, nonlinear stories), **Voyant** (web-based reading and analysis environment for digital texts), and **WeVideo** (video editing software)

instances of missing examples, only a description of the product is presented at the bottom of the table.

Each instructor was assigned an instructional designer, and the two met as frequently as necessary. The instructional designers were also available for further assistance at weekly coffee hours. Support ranged from standing meetings to being available during an entire class period. Instructors reported that instructional designers helped them "identify useful technology, pulled together a list of resources for students to use when they had questions about using the technology, and discussed ideas about course design." One complaint was that "the instructional designer had way too much work assigned" and "could not meet with me as often as I needed."

Overall, instructors' comments demonstrated that they welcomed digital inclusion into their existing instruction even though one instructor noted that the DLI course proved time-intensive:

> I would have liked to spend the professional development funds to take the students on a digital field trip. I feel like I needed a course release because of the time I spent doing prep for the DL course. My four-class load made it hard for me to spend as much time as I wanted on the class.

Nonetheless, instructors felt that participating in the initiative made their teaching more effective and led to stronger student engagement (see Figure 1). One instructor categorized the experience as "awesome" and stated that he saw "a difference in the quality of student work," and another praised the DLI experience as follows:

> [My] classroom has moved away from lecture format and more toward roundtable discussion. The students are far more engaged when they feel that they can create arguments using digital formats in which they are more expert than I. We learn from each other in this way.

DISCUSSION

The present study introduces a digital literacy model for honors education, provides concrete examples for implementation, assesses the impact of the model on learning and pedagogy, and continues the digital conversation in the honors community. The study's goal was to discover how adapting

pedagogy to include digital competencies might meet the objectives of undergraduate honors education.

The data collected in this study indicate that the goals and implementation of the DLI are consistent with at least four propositions of the NCHC's "Definition of Honors Education and Modes of Honors Learning":

- **an opportunity "appropriately tailored to fit the institution's culture and mission"**

  The DLI accommodated GSU's diverse campus demographic, which supports a high percentage of students from a low to middle socio-economic status. Access to technology is not guaranteed in every household, so we cannot assume that students will eventually become digitally literate.

- **"carefully selected teachers and students who form a cross- or multi-disciplinary cohort dedicated to achieving exceptional learning and personal standards"**

  The initiative's call for proposals added a layer of new vetting of honors courses. Courses not only had to obtain approval for meeting the standards of an honors course but also to meet innovative standards to qualify as a DLI course.

- **"measurably broader, deeper, and more complex learning-centered and learner-directed experiences"**

  Curricula emphasized exploration, addressed real-world issues with digital solutions, and provided student-centered projects.

- **an opportunity for student "development or transformation" in the form of "problem-solving, often with creative approaches"**

  At an end-of-semester DLI showcase, students discussed their progression, provided specific details about completed projects, and interacted with a broad range of digital tools.

The overall goal of the initiative was to provide digital resources that would lead to enhanced problem-solving skills for students and more relevant and engaging class sessions for instructors. The DLI courses provided a laboratory for students to experiment with various technologies that could improve efficiency in their chosen fields of interest and professions. For example, one of the primary attributes of undergraduate research is its ability to strengthen critical thinking skills. Some of the DLI courses introduced

students to research management tools such as Zotero and Mendeley (see Table 3) that allow students to spend less time manually organizing their references and more time constructing a well-developed research project.

The present study provided baseline data for the impact that technology can have in honors education. A larger sample size could have led to more robust feedback, but the main limitation of the study was that it did not test specific competencies like those introduced by Murray and Pérez. Although foundational digital skills span all areas, the study focused on tools that increase efficiency and productivity in a chosen field. Digital skills differ by discipline and profession so should be evaluated accordingly.

As Johnson stated, limited research is available on honors pedagogy as it relates to technology. This study explored the perceptions of students and instructors about a specific initiative after one semester, but future studies could collect longitudinal data to assess the initiative's long-term influence on learning and pedagogy in order to substantiate claims of lasting positive impact. Additionally, a study could be conducted to determine which learning constructs—i.e., critical thinking, motivation, and creativity—are affected by technology integration. Discipline-specific digital competencies could also be identified to develop a pre-test/post-test study design to assess skill level before and after an intervention. A broader range of research on this topic could lead to general insights about the current digital climate in honors and what is needed.

RECOMMENDATIONS AND CONCLUSION

Students were vocal about the preparedness of the digital literacy instructors and the advantages of having access to personal computers. Most students were pleased with the level of preparedness of their instructors, but some expressed disappointment in the lack of instructor preparation. An attempt to learn and teach a tool simultaneously along with an absence of well-established course goals can attribute to perceived unpreparedness. Students expect instructors to explain assignments thoroughly; if instructors are unable to do so, students may lose trust and disengage, so thorough training before the beginning of the course is necessary. When integrating technology into the classroom, the instructor may need to structure the curriculum in a way that does not confound topics with the new technology. Goals should be established to clarify whether the expectation is to master the material or the technology or both; if it is both, then resources should be presented to ensure goal attainment, and instructors should explicitly describe how the

digital projects meet the learning outcomes for the course. As one instructor mentioned, having an instructional designer present during class sessions would be helpful, but this may not always be possible. At least instructional designers were available to instructors, and it might be beneficial for a similar resource, maybe a graduate assistant, to be available to students.

Although providing laptops is ideal for an initiative of this type, a department, college, or university cannot always provide these resources. If resources are limited, forging partnerships may be a viable option, e.g., seeking assistance from technology services on campus to discuss rental options.

The digital literacy initiative is ongoing in the GSU Honors College. Digital literacy courses are being offered in the fall of 2016, and instructors have leveraged the initiative to promote interdisciplinary approaches to learning. For example, the honors college established the Honors American Studies Cluster. Students interested in American Studies who also want to improve their personal digital literacy skills have the opportunity to sign up for the Honors Cluster, which, using a cohort model, offers a group of linked courses that focus on American studies. The professors teaching the six honors classes collaborate to deliver assignments related to the primary topic: 1) Mapping Atlanta: Community Mapping and Geospatial Storytelling (an honors seminar), 2) Graphic Novels: American Issues (a perspectives course), 3) Advanced English Composition, 4) American Literature, 5) American Government, and 6) U.S. History.

Technology is altering the landscape of education and offering unique opportunities for the honors community to champion this shift to enhance learning. Instructors do not have to abandon standard models of knowledge attainment in the classroom; rather, an environment should exist that promotes multiple pedagogical approaches. The honors community must continue to provide comprehensive educational models that resemble the real world to support successful student transition out of college. The positive results from the present study suggest that intentional technology integration is appropriate for honors education. When digital competencies are incorporated into the curriculum in a meaningful way, students and instructors can benefit from the experience.

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APPENDIX A

Digital Literacy Initiative Framework

1. Find and vet information online: Students need to be able to determine the quality and validity of online information.

2. See problems from digital perspectives: Students should be able to analyze a problem and determine how to use digital tools to solve it.

3. Become self-directed learners: Students should know how to take advantage of online information and become lifelong learners.

4. Buy digital solutions: Technology is continuously changing, and students should learn how to evaluate and purchase the right digital tools.

5. Learn software quickly: Students need to be able to teach themselves new tools quickly.

6. Design and create digital solutions: Students should be comfortable customizing and combining tools to create a complete solution.

APPENDIX B

Student Survey

Section I

Demographics

1. I identify my gender as
   a. Male
   b. Female
   c. Other

2. Age:
   a. 18–24 years old
   b. 25–34 years old
   c. 35–44 years old
   d. 45–54 years old
   e. 55–64 years old
   f. 65–74 years old
   g. 75 years or older

3. Ethnicity:
   a. African American
   b. Caucasian
   c. Hispanic
   d. Asian
   e. Other

4. College
   a. School of Policy Studies
   b. School of Nursing and Health Professions
   c. College of Arts and Sciences
   d. College of Education & Human Development
   e. College of Law
   f. School of Public Health
   g. College of Business

5. Classification
   a. Freshman
   b. Sophomore

    c. Junior
    d. Senior

6. Please check the digital literacy course(s) you were enrolled in during the fall 2015 semester.
    a. ENGL 1103
    b. HIST 1111
    c. HIST 2110
    d. HON 1000
    e. MATH 2211
    f. MATH 2212
    g. MATH 2215
    h. PSYCH 1101

Section II

Please respond (strongly agree, agree, neutral, disagree, strongly disagree) to each statement regarding your experience in the DLI during the fall 2015 semester.

Statement: Participation in the DLI increased my ability to

1. gather information and use online resources.
    a. Strongly agree
    b. Agree
    c. Neutral
    d. Disagree
    e. Strongly disagree

2. seek digital solutions to complete tasks in class or at work.
    a. Strongly agree
    b. Agree
    c. Neutral
    d. Disagree
    e. Strongly disagree

3. teach myself to use new software and online applications.
    a. Strongly agree
    b. Agree
    c. Neutral
    d. Disagree
    e. Strongly disagree

4. locate and purchase digital solutions when needed.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

5. learn new technology.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

6. locate resources to assist me in learning new technology.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

7. create digital solutions to complete tasks in class or at work.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

8. use digital knowledge and skills gained in my future studies.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

9. use the technology skills needed to be successful in my field.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

Section III

1. My overall experience in my digital literacy course(s) was:
   a. Excellent
   b. Good
   c. Fair
   d. Poor

2. Please provide any feedback in regards to your digital literacy course(s). (optional)

APPENDIX C

Instructor Survey

Section I

Demographics

1. Years of university level teaching: ____.

2. College:
   a. School of Policy Studies
   b. School of Nursing and Health Professions
   c. College of Arts and Sciences
   d. College of Education & Human Development
   e. College of Law
   f. School of Public Health
   g. College of Business

3. Academic ranking:
   a. Assistant Professor
   b. Associate Professor
   c. Clinical Assistant Professor
   d. Clinical Associate Professor
   e. Clinical Professor
   f. Instructor
   g. Lecturer
   h. Professor
   i. Professor of Practice
   j. Senior Lecturer

4. Did you teach a course that intentionally incorporated digital competencies prior to participating in Honors College Digital Literacy Initiative (DLI) during the fall 2015 semester?
   a. Yes
   b. No

Section II

When responding to each statement, please keep in mind your experience in your digital literacy course(s) during the fall 2015 semester. Respond using the Likert scale below (strongly agree, agree, neutral, disagree, and strongly disagree).

1. Prior to participating the DLI I used technology in my classroom to enhance learning.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

2. My comfort level with using technology in the classroom has increased since participating in the DLI.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

3. My participation in the DLI helped me to teach more effectively.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

4. My participation in the DLI helped me to foster stronger student engagement in learning.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

5. My experience in the DLI positively changed my teaching methods.
   a. Strongly agree
   b. Agree
   c. Neutral
   d. Disagree
   e. Strongly disagree

6. The DLI provided technological support when needed in my classroom.
   a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly disagree

7. I felt adequately supported for my time and effort while participating in the DLI.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly disagree

8. I will seek opportunities to teach digital literacy courses in the future.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly disagree

9. I believe the DLI accomplished the goal of enhancing students' digital competencies.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly disagree

Section III

When responding to each question, please keep in mind your experience in your digital literacy course(s) during the fall 2015 semester.

1. What were the specific technology needs in your class?

2. What was your relationship with your instructional designer? How was the relationship formed?

3. Please describe the format of your course and how you incorporated digital competencies.

4. Please provide any additional feedback you may have regarding the DLI.