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Transformative instruction or old wine in new skins? Exploring how and why educators use HyperDocs

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ABSTRACT

HyperDocs are interactive, digital teaching and learning materials created, disseminated, and remixed by educators. To date, HyperDocs have not been the subject of published, peer-reviewed research. To address this research gap, we engaged in exploratory, primarily qualitative research to systematically examine how and why teachers use HyperDocs. We used an online survey to gather data on educators’ (N = 261) uses of and perceptions regarding HyperDocs. Analysis suggested a wide range of definitions of, purposes for, and approaches to HyperDoc use, indicating that educators are adapting HyperDocs to their practice in myriad ways. Consistent with the openness and flexibility in finding, remixing, and using HyperDocs, educators identified a number of benefits of using these tools in their practice, including changes in student engagement and learning, shifts in instructional design and delivery, and changes in their own support and dispositions. Analysis of examples of HyperDocs shared by a subset of participants suggested some mismatch between rhetoric about HyperDocs and what was actually incorporated into them. We discuss these findings in relation to the work of educators and the future of research on HyperDocs and other crowdsourced teaching and learning initiatives.

1. Introduction

Increased access to the Internet and digital tools can facilitate new types of learning experiences. For instance, students in different countries can collaborate on Google Documents or discuss a shared reading on Flipgrid, a video-based discussion forum. Learners can take virtual tours, design multimedia, record podcasts, and build virtual worlds with the free digital tools available today. When combined with highly effective pedagogy, digital tools can shift how students access content and experience learning (Carpenter & Justice, 2017a; 2017); Zhao, Pugh, Sheldon, & Byers, 2002). Digital tools can be used to provide multiple representations of content, increase student interest and participation in learning, and offer multiple ways for students to show their knowledge, which are foundational elements of the Universal Design for Learning framework (CAST, 2018).

Yet, while the potential to redesign learning experiences with technology is present, many teachers tend to use technology to support existing teacher-centered practices (Palak & Walls, 2009; Tondeur, Kershaw, Vanderlinde, & Van Braak, 2013). For example, a recent large-scale survey of U.S. teachers found that only 22% indicated they were “very comfortable using technology to facilitate student collaborations, integrating mobile devices within instruction or differentiating instruction using digital tools” (Evans & Project
grade level of their students, the content being taught, and the length of lesson. Next, educators must determine the 

- organize the steps students should follow, such as Explore-Explain-Apply, or the 
- learning; 3) packaging; 4) workflow; 5) design. First, educators should identify learning 

2.2. Design of HyperDocs 

for the whole class, collaborative learning, and self-paced tasks for individuals. 

envision HyperDocs as a way to package and deliver lessons to meet all students 

formative, interactive Google docs that replace the standard worksheet method of delivering instruction

- Tomorrow, 2019; para. 23). As the rapidly shifting technology landscape seems to outpace the opportunities schools and districts 

provide for professional learning, teachers can struggle to meaningfully embed digital tools into their practice. 

In an effort to change this narrative, educators Lisa Highfill, Kelly Hilton, and Sarah Landis (2015) presented a simple, yet potentially powerful idea for enriching teaching and learning with technology: the HyperDoc, which they describe as a “tool used to transform your lessons into interactive, multi-layered experiences for students” (para. 2). The HyperDoc concept has proven to be attractive to many educators and has reportedly inspired shifts in the design and delivery of learning experiences. Highfill, Hilton, & Landis, have helped encourage many educators who use HyperDocs, with their Facebook group boasting more than 20,000 members and their Twitter handle (@TsGiveTs) having similar number of followers. Additionally, the “Teachers Give Teachers” repository on their website features more than 12,000 freely available HyperDocs (see https://hyperdocs.co/). Despite HyperDocs’ popularity and potential to influence teaching and learning, they have not been the subject of published, peer-reviewed research that we could find. 

Therefore, the purpose of this exploratory, primarily qualitative study was to help fill a gap in the literature by exploring how and why educators use HyperDocs.

2. Background and literature 

To contextualize this research, we give background on HyperDocs and showcase an example HyperDoc. We then describe literature on the related topics of WebQuests and new forms of curriculum production and dissemination in the Web 2.0 era.

2.1. What are HyperDocs? 

HyperDocs are interactive, digital teaching and learning materials created, disseminated, and remixed by educators. Most commonly, HyperDocs are understood to be digital lessons that are housed in electronic documents or slides and that include content, media, and hyperlinks—thus, the portmanteau name derived from hyperlink and document. In The HyperDoc Handbook, Highfill, Hilton, and Landis (2016) describe HyperDocs as a type of “digital lesson design and delivery of instruction” as well as a “teaching pedagogy” (p. 7). They have also associated HyperDocs with Google Suite’s productivity apps, describing HyperDocs as “trans

formative, interactive Google docs that replace the standard worksheet method of delivering instruction” (p. 7). Highfill and colleagues envision HyperDocs as a way to package and deliver lessons to meet all students’ needs. HyperDocs can be used for direct instruction for the whole class, collaborative learning, and self-paced tasks for individuals.

2.2. Design of HyperDocs 

The HyperDoc Handbook Study Guide (Highfill et al.) features a five-step template for creating a HyperDoc: 1) objectives; 2) cycle of learning; 3) packaging; 4) workflow; 5) design. First, educators should identify learning objectives and desired outcomes based on the grade level of their students, the content being taught, and the length of lesson. Next, educators must determine the cycle of learning to organize the steps students should follow, such as Explore-Explain-Apply, or the “HyperDoc Model,” which includes seven components:

- Engage - capture students’ attention from the start 
- Explore - provide students with a curated collection of resources to explore 
- Explain - describe the lesson, including the learning objective 
- Apply - design an activity where students can apply their knowledge of the topic by using digital tools to create, collaborate, and/or connect with others outside of the classroom 
- Share - ask students to share their work with peers, the instructor, or a global audience for feedback 
- Reflect - encourage students to reflect on their learning progress and goals 
- Extend - embed additional resources for students to learn more about the topic

On the Basic HyperDoc Lesson Plan Template, which features an overview of this model, Highfill and colleagues encourage educators to “alter, edit, and customize to the structure of the lesson [they] are creating” (Highfill et al., para. 1). As a result, a number of variations of this “HyperDoc Model,” such as “Connect, Learn, Engage, Apply, and Share” and “Engage, Explore, Explain, Elaborate, and Evaluate,” have also been popularized.

After determining the objectives, desired outcomes, and cycle of learning, Highfill and colleagues recommend identifying the Google App (e.g., Docs, Slides, Maps, Sites) that works best for packaging the content and learning experiences. For instance, an educator who wants students to watch multiple videos during their learning experience might select Google Slides or Sites because videos can be directly embedded, as opposed to Google Docs where students must leave the document to watch a video on an external site. Next, educators should consider the workflow of the HyperDoc, including how it will be delivered, how students will submit their work, and how educators will give feedback. Finally, Highfill and colleagues recommend thinking about the visual design of the HyperDoc, including fonts, colors, table properties, multimedia, and spacing so that it is appealing and engaging to students.

2.2.1. Example HyperDoc 

The four figures in this section are from a HyperDoc created by a U.S. middle school teacher, Louie Soper, who consented to this material being used as an example of a HyperDoc. The figures display key features of a HyperDoc. Fig. 1 is the opening slide of the
HyperDoc. The bottom right corner features the objectives for the HyperDoc lesson. The top right corner includes a Table of Contents featuring the cycle of learning. This HyperDoc creator chose to use six of the seven components of Highfill and colleagues’ model. Fig. 2 is part of the Explore section of the HyperDoc, and includes a video clip and spaces for student responses. In order to package this multimodal lesson in a visually appealing design, the HyperDoc creator selected Google Slides. Fig. 3 shows the Apply section, where students are directed to create their own models of the phases of the moon. This slide also provides an example of the workflow, as students are asked to submit their work on Google Classroom. Fig. 4 displays the Extend options provided for students who finish their work early or want to learn more.

2.3. Use of HyperDocs for teaching and learning

The ways educators create and use HyperDocs in their teaching can vary widely. For instance, a HyperDoc can be a choice-based agenda, learning activities playlist, student-centered learning module, station activity, substitute teacher plan, or parent resource (Gonzalez, 2017). The variety of ways in which HyperDocs can be designed and used means HyperDocs could, in different scenarios, represent learning from technology (i.e., technology as a delivery tool) or learning with technology (i.e., technology as a cognitive partner; Jonassen, 1996). In some cases, HyperDocs could facilitate student use of technology to access and analyze information, interpret and transform that information into their own personal knowledge, and then represent that knowledge to others (Ertmer & Ottenbreit-Leftwich, 2013) (i.e., learning with technology), but in other instances it might function in more teacher-centered ways (i.e., learning from technology).

Given the flexibility of the HyperDoc concept, Highfill (2016) cautioned that “they can easily be a digital worksheet depending on the lesson design and content you include” (para. 1). To move beyond a digital worksheet, Highfill and colleagues emphasize the importance of HyperDocs engaging students in the “4 Cs” of creativity, collaboration, communication, and critical thinking (Partnership for 21st Century Skills, 2007). According to the National Education Association’s (2012) “Preparing 21st Century Students for a Global Society: An Educator’s Guide to the ‘Four Cs,’” creativity refers to the ability to use idea generating techniques (e.g., brainstorming), design, analyze, and modify ideas, work creatively with others, and implement innovation. Collaboration consists of working respectfully with diverse teams, being flexible and making compromises to achieve common goals, and assuming shared responsibility for group work. Communication is the ability to articulate thoughts and ideas clearly in diverse environments through oral, written, and nonverbal communication skills, actively listening to others, and using technology to express ideas and thoughts. Critical thinking refers to using systems thinking (e.g., examining how different parts of a complex system interact with one another), making judgements and decisions (e.g., analyzing, evaluating, interpreting, and synthesizing information and ideas), and solving problems. Taken together, the 4 Cs represent essential knowledge and skills for navigating the multifaceted nature of society and the workforce. In contrast to learning environments where students are passive consumers of information, HyperDocs can, in theory, offer teachers a way to incorporate student-centered learning tasks and activities grounded in the 4 Cs.

Fig. 1. Screenshot of the landing page of HyperDoc.
2.4. Connections to prior research

While research on HyperDocs is lacking, they appear to share some commonalities with WebQuests, which are Internet-based inquiry-oriented activities popularized in the 1990s where students interact with and explore online resources (Dodge, 1995). Similar to HyperDocs, WebQuests are meant to provide guidance and structure for student exploration of a topic through curated digital content. These student explorations can engage students in Constructivist problem solving that includes knowledge application and scaffolded learning (Tsichouridis, Batsila, Vavougios, & Tsichouridis, 2019; Zheng, Stucky, McAlack, Menchana, & Stoddart, 2004). Research on WebQuests has suggested a wide variety of potential benefits for learners, including the enhancement of student communication, higher-order thinking skills, and social skills (Aydin, 2016). For example, Chang, Chen, and Hsu (2011) studied 6th grade students’ $(N = 106)$ in an outdoor environmental education context and reported that the students who used Webquests performed better than a control group. Similarly, in an adult learning setting $(N = 20)$, Ebadi and Rahimi (2018) found that students who engaged with Webquests outperformed a control group in terms of critical thinking and academic writing. However, the literature on WebQuests also includes studies that suggest problems with learners not feeling comfortable with WebQuests (Koc & Bakir, 2010), and preferring more traditional computer-assisted activities (Peters, Weinberg, & Sarma, 2009), and that some teachers may implement WebQuests without fidelity to the intended model (Dodge, 2001). This literature therefore hints at the likelihood of both opportunities...
and challenges for Internet-based inquiry-oriented activities such as HyperDocs.

Although WebQuests tend to have a prescribed instructional design model (introduction, task, process, resources, evaluation, conclusion; Dodge, 1997), HyperDocs are more broadly defined to allow for flexible, open use. And while WebQuests originated before the development of Web 2.0, social media, and Google Suite, HyperDocs are intended to include more social uses of technology—by both students and teachers. Student use of HyperDocs is meant to feature collaboration, cooperative learning, and/or sharing of work with an audience beyond the classroom. Many teachers share their HyperDocs with other educators beyond their schools via the HyperDocs.co/teachers_give_teachers repository and/or via social media; this could be considered a way of making their teaching practice public (Lieberman & Pointer Mace, 2010), and thus creating opportunities for feedback and discussion. Additionally, teachers’ creation of HyperDocs often includes some degree of crowdsourcing (Brabham, 2008) and/or remixing (Lessig, 2008) of content. In an era in which websites such as Teacherspayteachers.com facilitate educators buying and selling teaching and learning materials (Greene, 2016; Shelton & Archambault, 2018), HyperDocs are, by contrast, meant to be freely shared, and often co-constructed, like those on the TeachersGiveTeachers site. Given Highfill, Hilton, and Landis’s emphasis on HyperDocs being freely available and designed for remix and reuse, they are in some regards similar to Open Educational Resources (OER; Butcher, 2015). However, it is not clear that many HyperDocs feature Creative Commons licenses, like OERs, which are formally released under an open license.

Teacher communities often help with the diffusion of instructional innovations, such as HyperDocs, and the development of social technologies has meant that such communities now can more easily extend beyond their immediate geography (Trust, Krutka, & Carpenter, 2016; Goatley & Johnston, 2013). HyperDocs also emerged after the adoption of the Common Core State Standards across the majority of U.S. states created a bigger common marketplace for educational resources, and “created conditions that challenge the traditional dominance of textbook publishing companies in the curriculum marketplace” (Hodge, Salloum, & Benko, 2019, p. 2). HyperDocs appear to be one way in which educators may be producing curricula and materials that allows them to share their practice-based wisdom with the larger profession, a process that historically has not been widespread in the United States (Stigler & Hiebert, 1999).

2.5. Research questions

While Highfill and colleagues have offered a vision for HyperDocs, and HyperDocs have been lauded by a large community of educators who use them in their practice, there is very little known about the actual incorporation of HyperDocs into educational settings. Why have many educators begun using HyperDocs? How do educators create, remix, and employ HyperDocs? To what extent do HyperDocs transform teaching and learning or are they just the latest digital version of teacher-centered pedagogy? In this study, we set out to learn more from the educators who use HyperDocs in their practice by addressing the following research questions:

RQ1. How do educators conceptualize HyperDocs?
RQ2. How do educators use HyperDocs in their practice?
RQ3. Why do educators use HyperDocs?

3. Methods

This study is exploratory, primarily qualitative research, which included coding and analyzing open-ended survey questions, coding and analyzing sample HyperDocs, statistically analyzing closed survey items, member checking, and triangulation of the results from these data analyses.
3.1. Instrument

Using the commercial survey platform Qualtrics, we designed an online survey to capture information regarding educators’ HyperDoc use. Survey design was informed by relevant literature (e.g., Carpenter & Krutka, 2014; Ertmer & Ottenbreit-Leftwich, 2013) and criteria for electronic survey design quality (Dillman, Smyth, & Christian, 2014). Our research team shared an early survey draft with Highfill, Hilton, and Landis. We made edits based on their feedback and further refined the survey before soliciting expert feedback from scholars familiar with the HyperDocs concept (Olson, 2010). We made adjustments to the survey based on the responses from five of these experts. Three pre-service teachers also tested the survey for functionality and clarity of language. The final survey version included 15 items about the participants and their work contexts, and five close-ended and six open-ended items about HyperDocs (see Appendix A for the survey items).

3.2. Data collection

Data were collected via convenience sampling. After securing approval to conduct this research from the Institutional Review Board (Elon University #2018-123) at the first author’s institution and arranging IRB Authorization Agreements with the other authors’ institutions, we shared invitations to the survey via various social media channels for approximately one month. We shared the invitation in the main HyperDoc Facebook group, and also posted tweets with the survey invitation that included education hashtags in order to extend the reach of the tweets beyond our own networks. Highfill and colleagues also sent an email invitation to the survey to participants in an online course they had taught on HyperDocs.

3.3. Sample

A total of 261 educators responded to the survey. The overwhelming majority were from the United States (Table 1). The educators in our study held various positions, including classroom teacher (n = 150; 57%), instructional technology facilitator (n = 37; 14%), instructional coach (n = 25; 10%), special education teacher (n = 9; 3%), media specialist/librarian (n = 8; 3%), administrator (n = 8; 3%), and higher education instructor (n = 3; 1%). Participants reported teaching a wide range of subjects from Career and Technical Education to world languages. The most commonly taught subjects were English/Language Arts (n = 149; 17%), Social Studies/History (n = 113; 13%), Technology (n = 99; 12%), Science (n = 99; 12%), and Math (n = 94; 11%). The vast majority of participants reported having more than 5 years of experience in education (n = 242; 93%), with almost half of the sample (n = 125; 48%) indicating they had between 11 and 20 years of experience.

The majority of the survey participants were K-12 teachers in state-funded public schools (n = 214; 82%). The remainder of the participants reported teaching in independent/private K-12 schools (n = 24; 9%), public K-12 charter schools (n = 11; 4%), or other settings (n = 12; 5%), such as college or universities. The K-12 educators in our study indicated they worked in elementary settings (n = 84; 32%), middle schools (n = 72; 28%), high schools (n = 55; 21%), or K-12 schools (n = 33; 12%). One-third (n = 81) of the participants reported working in relatively lower poverty schools (less than 25% of students receiving free or reduced-cost lunches, a common proxy for poverty in the United States), while 52 participants (21%) indicated working in high poverty schools (more than 75% of students receiving free or reduced-cost lunches). The remaining K-12 participants reported working in schools with between 25% and 75% of students receiving free or reduced-cost lunches.

Most of the participants indicated that their students had access to technology at school. The type of technology and access ranged from one laptop/tablet per student programs (n = 157; 39%), to students with personal devices (n = 80; 20%), to access to laptop/tablet mobile carts or labs (n = 132; 23%). The vast majority of participants (n = 256; 98%) also indicated that their students had reliable in-school Internet access. However, access to technology and the Internet outside of school was not as consistent. Participants reported that, on average, 80% (SD = 19.8) of their students had access to technology and 75% (SD = 21.0) of their students had consistent Internet access outside of school.

The participants generally appeared to be experienced with technology and HyperDocs. In terms of how they defined themselves as educators, they overwhelmingly considered themselves early adopters of technology and new instructional practices (Table 2). The participants tended to be involved in collaborative design of curriculum and instructional materials with other educators at their own schools and beyond. Furthermore, 59% (n = 158) of the sample reported that they had benefited from some type of professional development related to HyperDocs, including 22% (n = 58) who indicated they had taken part in the online course on HyperDocs.

Table 1
Participants’ reported locations.

| Country         | N   | %    |
|-----------------|-----|------|
| U.S.A.          | 223 | 85.4 |
| Unidentified    | 14  | 5.4  |
| Canada          | 11  | 4.2  |
| South Korea     | 2   | 0.8  |
| South Africa    | 2   | 0.8  |
| Spain           | 2   | 0.8  |

Individual responses from Argentina, Colombia, Costa Rica, Dominican Republic, Malaysia, Peru, and Vietnam.
HyperDocs included seven tests of homogeneity, and point-biserial correlations. For the two open-ended items addressed in this paper, two members of the open-coding process to analyze the qualitative data (Braun 3.4. Data analysis primarily in agreement on codes, rather than on an interrater reliability statistic (Saldaña of data within the samples (e.g., single slides) and activities could receive multiple codes. The coders then met on two occasions with a research team independently coded a subset of sample HyperDocs to verify the appropriateness of the emergent codes that emerged from the data. Additionally, we manually gathered descriptive statistics from each HyperDoc such as what kind of website (https://hyperdocs.co/) and the aforementioned 4 Cs (Partnership for 21st Century Skills, 2007). However, we also added codes that emerged from the data. Additionally, we manually gathered descriptive statistics from each HyperDoc such as what kind of form they took (e.g., document, slides, etc.) and how many links and embedded videos they included. First, two members of the research team independently coded a subset of sample HyperDocs to verify the appropriateness of the a priori codes and identify emergent codes. The two coders discussed their initial coding along with a third research-team member, and developed a tentative code structure with four emergent codes. Two coders then independently coded the entire set of sample HyperDocs. Individual chunks of data within the samples (e.g., single slides) and activities could receive multiple codes. The coders then met on two occasions with a third research team member to discuss their coding and address differences of interpretation. Through these discussions, three of the emergent codes were collapsed into a single code. Again, we relied upon intensive discussion to reconcile discrepancies and reach agreement on codes, rather than on an interrater reliability statistic (Saldana, 2016). With the sample HyperDoc coding, we engaged primarily in semantic coding by focusing on what was explicit in the documents (Braun & Clarke, 2006); it should be acknowledged that some of the ways in which the HyperDocs were actually deployed by teachers and used by their students might not have been evident by analyzing the HyperDocs themselves.

To increase credibility and trustworthiness (Twining, Heller, Nussbaum, & Tsai, 2017), we utilized investigator triangulation by having two or more researchers involved in all qualitative data analysis (Elliott, Fischer, & Rennie, 1999). The analysis of the sample HyperDocs provided by survey respondents also served as a form of data triangulation in relation to their responses to other survey items (Santiago-Delefosse, Gavin, Bruchez, Roux, & Stephen, 2016). A final stage of triangulation involved member checking (Elliott et al., 1999) in which we sent a draft of our results to a sample of participants and made edits based upon analysis of the feedback

| Question                                                                 | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|--------------------------------------------------------------------------|---------------|---------------|---------------------------|------------------|------------------|
| I am an early adopter of technology.                                     | 66            | 173           | 26                        | 69               |                   |
| I am an early adopter of new instructional practices.                    | 60            | 157           | 35                        | 90               |                   |
| I collaborate with other teachers at my school in the creation of curriculum and instructional materials. | 59            | 154           | 30                        | 79               |                   |
| I collaborate with other teachers from beyond my school in the creation of curriculum and instructional materials. | 44            | 116           | 35                        | 91               |                   |
| % | n | % | n | % | n | % | n | % | n | % | n |

3.4. Data analysis

We generated descriptive statistics including means, standard deviations, and ranges, for quantitative items and engaged in an open-coding process to analyze the qualitative data (Braun & Clarke, 2006). We also used SPSS Version 26 to run crosstabs, chi-square tests of homogeneity, and point-biserial correlations. For the two open-ended items addressed in this paper, two members of the research team independently open coded the first 50 responses. Initial code sets ranged from nine to 22 codes for individual items. Three research team members then compared and contrasted these initial emergent codes and discussed discrepancies. For the open-ended prompt that asked participants to define what a HyperDoc is, the wide range of ways participants described HyperDocs led to our initial open coding process producing an unwieldy set of codes. Upon review of these codes, we identified four broader categories that allowed us to simplify and collapse the initial set of codes. These were the form of the HyperDoc, elements included in the HyperDoc, purpose/intended outcomes of the HyperDoc, and the roles of students and the teacher associated with HyperDocs. For the open-ended prompt related to positive outcomes from HyperDoc use, discussion of the initial codes led to organizing thirteen codes into three categories: student change, pedagogy change, and educator change (see Appendix B for the codebook). For both open-ended items, once the respective code sets were finalized, all responses were independently coded by a first and second coder. Individual responses could receive multiple codes. Three research team members then met twice to compare and contrast the coding and reconcile discrepancies. Because of the interpretive nature of our coding process for the two open-ended items, we relied upon intensive discussion to reconcile discrepancies and reach agreement on codes, rather than on an interrater reliability statistic (Saldana, 2016).

As noted above, one optional survey item asked participants to share a well-designed HyperDoc that they had used with their students, and 81 individuals (31%) provided a hyperlink to a HyperDoc. However, we could not access the content for 12 of these links, while seven led to large collections of HyperDocs. Removing those cases, we were left with 62 HyperDocs to analyze. Our coding of the HyperDocs included seven a priori codes drawn from the “HyperDoc model” defined in Highfill and colleagues’ (2016) book and website (https://hyperdocs.co/) and the aforementioned 4 Cs (Partnership for 21st Century Skills, 2007). However, we also added codes that emerged from the data. Additionally, we manually gathered descriptive statistics from each HyperDoc such as what kind of form they took (e.g., document, slides, etc.) and how many links and embedded videos they included. First, two members of the research team independently coded a subset of sample HyperDocs to verify the appropriateness of the a priori codes and identify emergent codes. The two coders discussed their initial coding along with a third research-team member, and developed a tentative code structure with four emergent codes. Two coders then independently coded the entire set of sample HyperDocs. Individual chunks of data within the samples (e.g., single slides) and activities could receive multiple codes. The coders then met on two occasions with a third research team member to discuss their coding and address differences of interpretation. Through these discussions, three of the emergent codes were collapsed into a single code. Again, we relied upon intensive discussion to reconcile discrepancies and reach agreement on codes, rather than on an interrater reliability statistic (Saldana, 2016). With the sample HyperDoc coding, we engaged primarily in semantic coding by focusing on what was explicit in the documents (Braun & Clarke, 2006); it should be acknowledged that some of the ways in which the HyperDocs were actually deployed by teachers and used by their students might not have been evident by analyzing the HyperDocs themselves.

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4. Results

In the sections that follow, we address our three research questions by detailing participants’ conceptualizations of HyperDocs and descriptions of how and why they use HyperDocs in their practice.

4.1. RQ 1: How do educators conceptualize HyperDocs?

Prompted to define what a HyperDoc is, participants’ responses appeared to suggest that there is no standardized conceptualization of a HyperDoc. While the responses featured some commonly used words, such as “students” (n = 215; 82%), “learning” (n = 162; 62%), “document” (n = 145; 56%), “lesson” (n = 92; 35%), “interactive” (n = 68; 26%), “links” (n = 66; 25%), and “Google” (n = 40; 15%), overall the responses were quite diverse in nature, with no two exactly alike. The following quotes exemplify the diversity of descriptions of HyperDocs:

“A hyperdoc is a way of packaging learning material in order to give students choice, voice, and agency.”

“A hyperdoc is a live doc that has links to lead students, or anyone looking at it, to a different site. It is an interactive tool.”

“A HyperDoc is a digital lesson for students created by their teacher to create a blended learning environment to replace the traditional lecture and worksheet lesson.”

Even though there was variance in descriptions of HyperDocs, some common features in the definitions were apparent (Table 3). Almost three-quarters of the respondents (n = 190; 73%) described the form of the HyperDoc, while 30% (n = 79) listed the elements of a HyperDoc in their definition. Participants used terms such as “document” (n = 145; 56%), “lesson” (n = 92; 35%), “digital” (n = 76; 29%), “tool” (n = 25; 10%), “slides” (n = 24; 9%), and “worksheet” (n = 9; 3%) when defining HyperDocs, indicating that HyperDoc form can vary in terms of type of tool used (e.g., document, slides) and the depth of learning experience (e.g., worksheet vs. lesson). When discussing the elements within a HyperDoc, the most common were hyperlinks (n = 77; 30%), resources (n = 38; 15%), and multimedia (n = 27; 10%).

More than three-quarters of the respondents (n = 205, 79%) described the purpose or intended outcomes of the HyperDoc in their definition. In many cases, participants (n = 128; 49%) discussed the purpose in relation to pedagogy, using terms such as “deliver,” “present,” “guide,” “differentiate,” “assess,” and “blend.” For example, one teacher stated: “It is a learning tool that can be personalized for students to meet their needs and provide choice and authentic purpose for students.” This educator described HyperDocs’ purpose in relation to the personalized learning opportunities they afford. Some participants (n = 40; 15%) indicated a teacher-centric purpose of a HyperDoc, in which the goal was for teachers to curate or organize information and links for their students to review. Participants also discussed the purpose of HyperDocs in terms of student learning experiences (n = 132; 51%), such as engaging with the content (n = 54; 21%), discovering or exploring new information (n = 56; 21%), collaborating (n = 50; 19%), demonstrating or applying knowledge (n = 38; 15%), reflecting (n = 18; 7%), and thinking creatively (n = 18; 7%).

Approximately one-third of the respondents (n = 88; 34%) described the role of the teacher and/or student in their definition. Many of these responses focused on the shifting role of the teacher to an information curator or learning experience designer, and putting the student more in charge of their own learning. For instance, one educator wrote, “The teacher curates necessary resources and structures while the students have freedom of choice to demonstrate their learning.” However, a few participants described HyperDocs in somewhat more teacher-centered language related to delivering information to students. For example, a respondent explained that “A hyperdoc is a way to deliver instruction.” These quotes exemplify the diverse range of ideas about the role of the student and teacher when HyperDocs are used for teaching and learning.

4.2. RQ 2: How do educators use HyperDocs in their practice?

Participants in our study reported being users, remixers, and/or designers of HyperDocs for teaching and learning. More than three-fifths of participants (n = 157; 88%) received (n = 12) HyperDocs as a way of supporting their teaching and learning practices.

Table 3

| Code | Definition | Exemplar(s) | % of 261 |
|------|------------|-------------|----------|
| Form | Description of the structure of a HyperDoc in terms of the type of tool used to create it or the type of learning experience it provides | “A hyperdoc is an interactive document, often a Google Doc/Slide/Sheet, that allows students to work through a high-quality lesson (or unit).” | 73 |
| Element | Features integrated within a HyperDoc such as hyperlinks, videos, etc... | “An interactive document with links to reading, videos, podcasts.” | 30 |
| Purpose or Intended Outcomes | Reasons for using a HyperDoc or hoped for results from using a HyperDoc | “A HyperDoc is a vehicle for a student-centered learning experience.” | 79 |
| Teacher/Student Roles | Description of the action(s) enacted by the student and/or teacher when using a HyperDoc | “The teacher designs the lesson, but the students are learning by inquiry method.” | 34 |
quarters of the respondents had experience using multiple HyperDocs in their practice, with 208 respondents (80%) reporting they had used at least five HyperDocs in their teaching. Some participants \((n = 40; 15\%)\) were extremely active users who had incorporated at least 30 different HyperDocs in their practice. The majority of participants also had experience creating at least one HyperDoc from scratch, with more than one-third \((n = 101; 39\%)\) indicating that they had created 10 or more HyperDocs on their own.

On average, participants reported having used 13.4 (SD = 9.59) HyperDocs with students. It was slightly more common for them to have created HyperDocs from scratch \((n = 250; 96\%)\), than to have modified or remixed HyperDocs originally created by others \((n = 239; 92\%)\), and relatively less common to have collaboratively created a HyperDoc with another person \((n = 176; 68\%)\). When using HyperDocs created by others, participants indicated that major influences on selecting HyperDocs were if the HyperDoc included many activities perceived to be engaging for students \((92\%)\), provided opportunities for student choice \((89\%)\), or aligned with the curriculum the participant was required to teach \((86\%)\).

Participants reported that on average their students spent 29% (SD = 22.7) of their class time using HyperDocs. One survey item asked, “How do you use HyperDocs with your students?” (see Table 4). Participants reported most commonly using HyperDocs for students to independently explore topics, for collaborative learning, and to support student creativity. Less common uses of HyperDocs included for summative assessment and homework. Among participants who indicated “other” uses of HyperDocs, the most common was as a means of providing professional development for teachers \((n = 6, 2\%)\). The educators in our sample indicated they used HyperDocs with students, on average, for 4.85 different purposes. We looked at various crosstabs to see if there were clear distinctions between participants with particular characteristics \(\text{(e.g., professional role, content area, years of experience, experience with HyperDocs)}\) using HyperDocs in different ways, and did not discover any consistent patterns in the data. For example, Table 5 shows the results of the “How do you use HyperDocs with your students?” item broken down by the reported poverty level of the schools in which the participants taught; the responses were not statistically significantly different \((p > .05)\) as measured by chi-square tests of homogeneity.

In one open-ended item in the survey, respondents were given the option of including a HyperDoc that they had used with their students and that they believed was well-designed. We analyzed the 62 submitted sample HyperDocs in terms of their form, elements, and teaching and learning practices and principles. Regarding HyperDoc form, the majority of the examples were housed in Google Docs \((68\%)\), while 31% were in Google Slides; there was one example that was a Google Site. For the elements within the HyperDocs, all but one example included images, and on average, they included 14 links and 4 videos. In addition to hyperlinks to YouTube videos and websites with relevant content information, several educational technologies were popular destinations for hyperlinks, including Padlet \((45\%)\), EdPuzzle \((13\%)\), Flipgrid \((10\%)\), and Answer Garden \((8\%)\). Almost a quarter of the HyperDocs \((24\%)\) also gathered at least some kind of student responses via Google Forms.

In terms of the teaching and learning practices and principles embedded in the sample HyperDocs, 90% had at least one of the aforementioned 4 Cs from the Partnership for 21st Century Skills \(2007^\text{a}\). More than half of the HyperDocs included student creativity, critical thinking, or communication \(\text{see Table 6}\). Interestingly, collaboration was much less common, explicitly appearing in only 29% of the examples. In relation to the HyperDoc components suggested in the aforementioned “HyperDoc Model,” more than half of the examples included student activities that featured the following components: explore, explain, engage, share, and reflect \(\text{see Table 7}\). It was relatively less common that the sample HyperDocs included opportunities for students to extend/enrich, and apply.

While many participants spoke about student choice and autonomy as reasons to use HyperDocs, our analysis of the example HyperDocs found that fewer than one-third \((27\%)\) included activities which granted student choices, such as the opportunity for students to determine their learning pathway \(\text{rather than moving linearly through a slide deck or document)}\), the chance to explore topics and tools based on their interest, or the opportunity to show their knowledge in different ways. In addition, fewer than one-third \((29\%)\) explicitly mentioned any of the following: standards, learning objects, learning targets, or essential questions, even though Highfill and colleagues recommended identifying learning objectives and desired outcomes as the first step in the HyperDoc design process. Rubrics and other statements of evaluation criteria were also not particularly common \((13\%)\) as part of the example HyperDocs.

We looked at various crosstabs to see if there were clear distinctions between participants with particular characteristics \(\text{e.g., years of experience, experience with HyperDocs}\) and the sample HyperDocs they submitted. We did not discover any consistent patterns in the data. For example, when looking at which codes the sample HyperDocs received, broken down by the poverty levels of the schools in which the participants taught, the responses were not statistically significantly different \((p > .05)\) as measured by chi-square tests of

| Table 4 |
| --- |
| **“How do you use HyperDocs with your students? (check all that apply)”** |

| Answer | % of 261 | Count |
| --- | --- | --- |
| For students to explore the topic individually | 89 | 232 |
| For students to collaborate and explore the topic in groups | 76 | 197 |
| To provide opportunities for student creativity | 72 | 187 |
| To lead into a lesson or unit \(\text{(e.g., to spark interest)}\) | 70 | 183 |
| To flip the classroom | 50 | 131 |
| For formative assessment of student learning | 45 | 117 |
| For enrichment \(\text{e.g., students who finish an exam or activity early)}\) | 38 | 98 |
| For summative assessment of student learning | 23 | 59 |
| For homework | 13 | 35 |
| Other | 10 | 26 |
Similarly, there were no statistically significant associations between having participated in Highfill and colleagues’ online Bootcamp and the likelihood of sample HyperDoc receiving any code ($p > .05$). There were also no statistically significant associations between participants reporting any professional development on HyperDocs and the likelihood of their sample HyperDoc receiving any code ($p > .05$). However, participants who were more experienced using HyperDocs were more likely to provide opportunities for students to explore in the sample HyperDocs they submitted, $r_{pb}(60) = 0.328$, $p < .01$.

### 4.3. RQ 3: Why do educators use HyperDocs?

Respondents described diverse and varied outcomes of using HyperDocs, such as improved student engagement, increased opportunities for student autonomy, enhanced creativity and collaboration, feeling part of a community of HyperDoc-using educators, and positive changes in the lesson design process. Overall, their responses fell within three categories: student change, pedagogy change, and educator change (see Appendix B Table A1).

**Student changes** were the most frequently cited benefit of using HyperDocs, with the related codes being applied 220 times, and with 158 respondents (61%) mentioning at least one kind of student learning process or outcome change. Many participants felt that

### Table 5

| Survey Item: How do you use HyperDocs with your students? (check all that apply) | Total | 0-25% (lower poverty) | 26-50% | 51-75% | 76-100% (higher poverty) |
|---|---|---|---|---|---|
| To lead into a lesson or unit (e.g., to spark interest) | 70% | 74% | 75% | 68% | 62% |
| For students to explore the topic individually | 89% | 93% | 88% | 92% | 83% |
| For students to collaborate and explore the topic in groups | 76% | 78% | 75% | 70% | 79% |
| For homework | 12% | 14% | 14% | 10% | 12% |
| For enrichment (e.g., students who finish an exam or activity early) | 38% | 40% | 42% | 30% | 40% |
| For formative assessment of student learning | 46% | 44% | 41% | 52% | 46% |
| For summative assessment of student learning | 22% | 25% | 15% | 20% | 27% |
| To flip the classroom | 51% | 54% | 54% | 50% | 42% |
| To provide opportunities for student creativity | 72% | 70% | 71% | 72% | 75% |

### Table 6

| Code | Exemplar(s) | % of 62 | Count |
|---|---|---|---|
| Creativity | “Think of ways to reduce the amount of packaging for the product without damaging the product … Draw pictures of your new packaging for the product.” | 71 | 44 |
| Critical Thinking | “What three sentences in the Declaration of Independence would be impossible to remove?” | 58 | 36 |
| Communication | “Verbally share your completed vocabulary findings with your group. Did you choose the same words? If so, did you select the same images?” | 52 | 32 |
| Collaboration | “Working in small groups or with a partner, answer the following …” | 29 | 18 |

### Table 7

| Code | Exemplar(s) | % of 62 | Count |
|---|---|---|---|
| Engage | “Ponder this: Think about a time that someone’s words or actions impacted your day and made you feel like this: [image of an animal smiling]” | 61 | 38 |
| Explore | “In this section, you will go through the following information, which is a collection of text, videos, and graphics.” | 69 | 43 |
| Explain | “Teacher Input: What is a digital footprint? Explanation with Q&A.” | 69 | 43 |
| Apply | “Create a 4 slide presentation that visually describes each of the ecosystem service categories.” | 43 | 27 |
| Share | “Go to the ‘Share Your Thoughts document and answer the questions. Feel free to comment on your classmates posts.’” | 60 | 37 |
| Reflect | “Did your egg survive? In terms of the impulse equation, explain why/how your egg either survived or was cracked.” | 52 | 32 |
| Extend | “Read about theme. Watch the EdPuzzle. Based on what you read and watched, what is your definition of theme?” | 45 | 28 |

homogeneity. Similarly, there were no statistically significant associations between having participated in Highfill and colleagues’ online Bootcamp and the likelihood of sample HyperDoc receiving any code ($p > .05$). There were also no statistically significant associations between participants reporting any professional development on HyperDocs and the likelihood of their sample HyperDoc receiving any code ($p > .05$). However, participants who were more experienced using HyperDocs were more likely to provide opportunities for students to explore in the sample HyperDocs they submitted, $r_{pb}(60) = 0.328$, $p < .01$. 

### 4.3. RQ 3: Why do educators use HyperDocs?

Respondents described diverse and varied outcomes of using HyperDocs, such as improved student engagement, increased opportunities for student autonomy, enhanced creativity and collaboration, feeling part of a community of HyperDoc-using educators, and positive changes in the lesson design process. Overall, their responses fell within three categories: student change, pedagogy change, and educator change (see Appendix B Table A1).

**Student changes** were the most frequently cited benefit of using HyperDocs, with the related codes being applied 220 times, and with 158 respondents (61%) mentioning at least one kind of student learning process or outcome change. Many participants felt that
students became more engaged as learners \((n = 114; 44\%)\) when working with HyperDocs. For instance, one educator shared that by using HyperDocs, “students were excited about learning and actively engaged,” and another commented, “100% of my students are spending 100% of their time on task and engaged.” Participants also noted ways in which students exercised autonomy when using HyperDocs \((n = 37; 14\%)\). As a result of such opportunities for autonomy, students reportedly became more “empowered,” “independent,” and “self-reliant” learners. Additionally, some participants reported positive changes in student learning outcomes, such as improved test scores and enhanced understanding of the topic \((n = 26; 10\%)\). HyperDocs were credited with providing more or better opportunities for student creativity \((n = 26; 10\%)\) and collaboration \((n = 17; 7\%)\).

Pedagogy changes were the second most frequently reported benefit of using HyperDocs. These types of changes referred to shifts in lesson design or delivery. This code was applied 186 times across the data set, with 136 respondents \(52\%\) mentioning at least one kind of pedagogy change. Some respondents cited that using HyperDocs as instructional tools inspired changes in the way they designed lessons for students \((n = 25; 10\%)\). For example, one educator wrote: “HyperDocs really helped me to shift from simply uploading my content to a digital space to really considering solid lesson design. I measure each HyperDoc with the 4Cs and try to hit as many - if not all - in each,” while another participant shared that they gave “more careful thought to all of the steps of the lesson, [with an] emphasis on student choice and definitely better care for visual design and trying to simplify directions for improved student understanding.” These two quotes indicate that the development of HyperDocs can, in some cases, shift how educators create learning experiences for students.

In addition to changes in lesson design, participants reported a variety of changes in how they delivered lessons, such as giving students choice in their learning process \((n = 40; 15\%)\), personalizing learning experiences \((n = 46; 18\%)\), increasing the amount of differentiation in their teaching \((n = 18; 7\%)\), and spending more time checking on students individually or in small groups \((n = 9; 3\%)\). For instance, one educator shared that the most positive outcome of using HyperDocs was, “Being able to personalize learning and work with the students that really need help. The students that ‘get it’ can run with the HyperDoc and work in the extend lessons while I can help those that are struggling.” Another teacher wrote that “Students requested more HyperDoc activities, because they appreciated the meaningful differentiation.” Multiple educators praised HyperDocs as a means of creating better learning experiences for all students.

While most participants focused their responses on changes to their practice or student learning, a few \((n = 23; 9\%)\) identified benefits of using HyperDocs in relation to their own or other educators’ professional development. We categorized these responses as educator change. For the educators in our study who were in instructional support roles, their responses tended to center on how they used HyperDocs in teacher professional development or inspired educators they worked with to incorporate HyperDocs into their practice. For example, a respondent commented that the most important positive outcome of using HyperDocs was, “getting teachers to create and use their own HyperDocs with their students. By doing a lot of my PDs with HyperDocs, I can model not only good instruction but good instructional design.” A few participants also discussed the benefit of being part of the network or community of educators developing and/or using HyperDocs. This professional learning network (PLN) or community (PLC) reportedly supported their ongoing learning and growth. For instance, one individual shared that using HyperDocs “has also led to a larger PLC for me. I’ve met and collaborated with some great teachers on Twitter and now in real life that I wouldn’t have met if it wasn’t for HyperDocs.” Another participant commented, “The community that I have built while using Hyperdocs was the most useful for my practice as a teacher.”

Several participants commented on how the changes in pedagogy associated with HyperDocs and the related changes in student learning processes and outcomes also impacted their dispositions towards teaching. For example, a teacher with more than 10 years of experience commented, “It has rejuvenated me because my students are so engaged in learning.” Another teacher explained, “Giving students choice/voice/ownership of their learning and being able to coach them along has made teaching more fun than ever before.” A third teacher offered a similarly enthusiastic endorsement for HyperDocs: “Developing and modifying hyperdocs has had a 2-fold impact: It has energized my love for teaching and the power of allowing students pacing and choice gives energy to the classroom.”

In summary, educators identified multiple positive outcomes from using HyperDocs, including improving student learning, shifting pedagogy to meet students’ needs, and changes in educator development, support, or affect.

5. Discussion

This exploratory, primarily qualitative study offers initial insights into educators’ conceptualizations and uses of HyperDocs. Although Highfill and colleagues have championed the concept of a HyperDoc as a transformative tool for teaching and learning, researchers have not yet examined educators’ perceptions of HyperDocs as instructional tools. Given that the educators in our study were spending on average almost one-third of their class time using HyperDocs, there is value in understanding how and why HyperDocs are used. Our study presents four key findings that have implications for pedagogical practice and future research.

First, the openness and flexibility of HyperDocs has resulted in a considerable range of ideas about, and uses for, HyperDocs. Across the dataset, no two descriptions of HyperDocs were identical. Additionally, participants’ reported uses of HyperDocs varied widely, as did their perceptions of the benefits of using HyperDocs as instructional tools. As a result, the ways in which HyperDocs’ influence teaching and learning is largely dependent on educators’ conceptualizations of HyperDocs, and the extent to which they shift their practice to meet Highfill and colleagues’ vision for HyperDocs or whether they change the HyperDoc to meet their own pedagogy. Given the openness and flexibility of HyperDocs, one educator could use a HyperDoc to foster student-centered learning that supports the development of the 4 Cs (i.e., technology as a cognitive partner), while another individual might remix that same HyperDoc to present information to students, akin to a worksheet (i.e., technology as a delivery tool; Jonassen, 1996).

Almost two decades ago, Dodge (2001), one of the originators of WebQuests, expressed concern that some WebQuests, “do not
represent the model well at all and are merely worksheets with URLs” (p. 7), and it seems now that some HyperDocs also may fail to represent the model well. While Highfill and colleagues espouse a student-centered vision for HyperDocs, the way in which HyperDocs are disseminated and remixed means that they may sometimes be used by educators who do not understand that vision or how to realize it. The diversity in our participants’ responses suggests that not all educators are on the same page with Highfill and colleagues’ student-centered, 4Cs-focused HyperDoc definition. This was despite more than half of the participants’ reporting having benefited from professional development (PD) related to HyperDocs, including 22% having participated in the online course taught by Highfill and colleagues. Additionally, even though Highfill and colleagues provide a free HyperDoc template on their website, many of the sample HyperDocs we reviewed diverged to some extent from that model or interpreted it in different ways. For example, in the sample HyperDocs, the creators used the term “explain” in reference to students explaining their understanding or perspective, whereas Highfill and colleagues (n.d.) intended “explain” to refer to direct instruction by the teacher. Although Highfill, Hilton, and Landis have certainly gone to great lengths to publicize their vision of HyperDocs through their book, website, and online course, it appears that a consistent HyperDoc definition has not yet been embraced by users. As Zhang (2009) noted about Web 2.0, the collaborative development of knowledge and ideas as explicit objects—in this case, HyperDocs—that are shared in public spaces means that those objects can take on a life of their own.

Second, while the freedom to remix and design HyperDocs may create challenges regarding establishment of a consistent definition of HyperDocs, this same openness in instructional design can offer educators a new type of generative learning experience. In other words, there are both challenges and opportunities for teachers associated with the openness of the HyperDoc model. In contrast to traditional professional development where educators are often told what they need to do in their classrooms, educators can find, share, and remix HyperDocs based on their needs, interests, and goals. Participants reported using HyperDocs for independent student learning, small group work, formative and summative assessment, enrichment, homework, to introduce a topic, and to inspire interest in a topic. This range of uses indicates that educators are adapting HyperDocs to their practice in myriad ways. Furthermore, while some educators reported using, or shared examples of, HyperDocs in which students were given choice in what and how they learned, other educators described HyperDocs as a means of curating content to deliver to students. Thus, educators are able to adapt HyperDocs based on the level of student-centered learning experiences they are comfortable trying. HyperDocs reflect the reality that technology outcomes are not solely determined by the technologies themselves (Rambe & Nel, 2015); rather humans have agency to determine the way technologies are used and contexts also influence the extent to which technology affordances or constraints are more or less relevant. Rather than being prescriptive, HyperDocs are a model to build from, a tool to try out and tweak, and a way of supporting technology integration without having to use a specific digital tool.

Third, there appeared to be instances of both match and mismatch between educators’ conceptualization of HyperDocs and the sample HyperDocs we examined. For instance, 72% of survey respondents indicated that they used HyperDocs to provide opportunities for student creativity, and 71% of the sample HyperDocs included opportunities for student creativity. However, survey responses and sample HyperDocs did not always align so closely. For example, while many participants identified student choice and autonomy as a purpose for (89%) and important benefit of (29%) HyperDoc use, fewer than one-third of the HyperDocs analyzed offered clear opportunities for students to make choices or drive their learning. Similarly, while 75% of respondents indicated they used HyperDocs to support student collaboration, including 89% of the participants who provided sample HyperDocs, less than one-third of the sample HyperDocs featured activities that supported collaborative learning. This echoed the findings from a recent large-scale survey of U.S. teachers (Evans & Project Tomorrow, 2019) that many teachers were not comfortable using technology to facilitate student collaboration. Because the HyperDocs we examined were from a small subset of participants who were willing to share a link to a HyperDoc they created that they considered well-designed, these findings may not represent the full set of participants. However, given that participants willingly shared what they perceived to be a quality HyperDoc, this apparent misalignment between Highfill and colleagues’ vision of HyperDocs and many of the teachers’ own rhetoric about HyperDocs is noteworthy and a topic for further exploration (see Cohen, 1990). There is a need for a more in-depth review of educators’ HyperDoc use to determine the extent to which they transform learning or tend to operate more as another teacher-centered application of technology (Cuban, 2001; Palak & Walls, 2009; Tondeur et al., 2013).

Fourth, educators identified a range of benefits of using HyperDocs in their practice. Participants reported increased student engagement and student learning outcomes, positive changes in their instructional design and delivery, feeling part of a community of educators, and affective growth. These reported benefits indicate that HyperDocs have the potential to make a positive impact on teaching and learning. While the HyperDoc concept is relatively simple, it seemed to be transformative for some participants. Slightly more than half of the respondents reported changes in their teaching, including the way that they delivered and designed instruction, as a result of using HyperDocs. Some educators discovered more powerful instructional design strategies, such as providing students with multiple ways to access information and share their knowledge (CAST, 2018), while others learned how to shift away from lecturing toward student exploration, creative thinking, and collaborative learning experiences. Therefore, these findings indicate that further research is warranted regarding the impact of HyperDocs on teaching and student learning. Specifically, how does HyperDoc use facilitate or inspire changes in teaching and learning? How meaningful and beneficial are those changes? What may be frequently missing from HyperDocs? For example, many of the sample HyperDocs we analyzed did not include learning objectives or essential questions to guide and inspire student learning (Wiggins & McTighe, 2005). Furthermore, why might HyperDocs not facilitate changes in pedagogy for all educators? And, how do HyperDocs impact student skills and knowledge? While 60% of the participants reported the HyperDocs positively impacted student learning, only 10% of the participants noted changes in student test scores or understanding. The majority of shifts in student learning outcomes centered on engagement levels.

On the evidence of these four findings, we recommend that educators and scholars further explore the opportunities and challenges of HyperDocs as tools for transforming teaching, teacher learning, and student learning. We therefore discuss implications for research
and practice in the sections that follow.

5.1. Limitations and future research

This study had several limitations that suggest avenues for future research. First, we relied upon a convenience sample. Our sample may have featured an overrepresentation of more advanced HyperDoc users given the distribution of an invitation to take the survey was sent to participants in Highfill, Hilton, and Landis’s online course about HyperDocs. It may therefore be the case that there would be even less understanding of and fidelity to Highfill and colleagues’ vision for HyperDocs among the larger population of HyperDoc-using teachers. Second, while some participants did mention the impact of their HyperDoc use on student outcomes, we did not collect any direct evidence of student learning. Third, although we triangulated respondents’ self-reported survey data to some extent through analysis of the example HyperDocs they submitted, we did not actually observe their implementation of HyperDocs with their students. Future research that includes classroom observations of HyperDoc use could therefore add to the knowledge base. Fourth, analysis of the sample HyperDocs themselves may not have always revealed important aspects of how teachers deployed them. Interviews of HyperDoc-using teachers could therefore expand upon the findings of this study by, among other questions, having participants talk through how and why they implement a specific HyperDoc.

Evidence is needed regarding the characteristics and uses of HyperDocs that truly lead to improved student outcomes, as “most innovations, good or not so good, have provided some sort of evidence of their value in order to get traction, but broad evidence is needed to know whether an innovation is useful” (Goatley & Johnston, 2013, p. 100). Further research could build upon the foundation of this study in various ways. Additional content analysis of HyperDocs could add nuance to understanding of their common features. Ethnographic research could contribute to the knowledge base by exploring to what extent the use of HyperDocs reflects Highfill and colleagues’ ideals, how HyperDocs may be used differently across contexts and content areas, and to uncover the challenges that are likely to arise during the implementation of any new approach to teaching and learning. As the reuse process for OERs remains understudied (Clements & Pawlowski, 2012), research could also specifically explore how and why teachers adapt HyperDocs that they did not originally create. For example, what steps do teachers take to create alignment between HyperDocs and the specific needs of each classroom, and what factors result in teachers’ willingness to use materials created by others (see Pirkkalainen & Pawlowski, 2014)? Given the important role social media seem to have played in the spread of the HyperDoc concept, it would be beneficial for studies to address the opportunities and challenges associated with teachers sharing and co-developing teaching and learning materials with far-flung colleagues (see Carpenter & Harvey, 2019).

Additionally, researchers could examine how HyperDoc use relates to concerns around digital equity. While prior research has suggested a “disturbing trend of innovations taking root primarily in already advantaged school settings” (Reich, Murnane, & Willett, 2012, p. 2), our sample included educators who worked in schools of varying levels of affluence. However, future research could explore, for instance, whether HyperDocs used in more affluent schools are more reflective of Highfill and colleagues’ vision of transforming teaching and empowering learners, while HyperDocs used in schools with higher poverty rates are more teacher-centered and used for preparation for drill and practice for standardized tests.

5.2. Implications for practice

Despite its limitations, this research offers potential implications for educators, curriculum and instruction leaders, and teacher educators. The diversity of definitions we found for what HyperDocs are suggests that teachers who use HyperDocs may want to reflect upon what they understand the purposes of HyperDocs to be and how those purposes are manifested in the ways they design and employ them. If HyperDocs are to be truly transformational, the bold rhetoric used to describe them must be accompanied by design and implementation that is not simply a digital repackaging of overly teacher-centered or teacher-controlled practices. In particular, it appears important that if HyperDocs are to empower learners, teachers must ensure that the HyperDocs they design and use actually grant to students opportunities to make meaningful choices. Additionally, because most of our sample of participants used at least some HyperDocs originally created by others, it also seems key that teachers evaluate HyperDocs with a critical eye, taking into consideration different modifications that might be necessary given the particular context of their students, classroom, and school. The organic sharing of HyperDocs among teachers certainly brings with it benefits, but can also present challenges if ascertaining the quality or trustworthiness of HyperDocs is difficult.

Curriculum and instruction leaders could potentially help teachers in assessing the quality of HyperDocs and in facilitating their effective implementation. Curriculum and instruction leaders whose teachers employ HyperDocs may have to adjust to the “open, emergent, chaotic nature of online interaction,” as it can create some tension with the “rigidly organized social structure of formal education” (Zhang, 2009, p. 276). Curriculum facilitators might help teachers determine how to evaluate HyperDocs, integrate HyperDocs with existing curriculum mandates, and or determine cases where it might make sense to lead a collaborative effort among educators to co-construct HyperDocs. Teacher educators could consider how best to prepare future teachers who can both be critical consumers and take advantage of potential benefits of HyperDocs. Today’s pre-service teachers draw inspiration for their teaching from a variety of sources, including online resources (Sawyer et al., 2019) such as HyperDocs, and would likely benefit from guidance regarding the effective use and creation or co-creation of HyperDocs.

6. Conclusion

In recent years, a substantial number of educators have begun using HyperDocs in their classrooms. Among the educators in our
sample, there were high levels of enthusiasm for HyperDocs and belief in their potential to contribute to teaching and learning in meaningful ways. If HyperDocs truly can help empower students to express their autonomy and creativity as they engage, explore, apply, share, and reflect in relation to well-designed and interactive content, then HyperDocs can make an important impact on the education landscape. However, while some of our findings may generate optimism regarding HyperDocs, it is far from certain what influence HyperDocs will have. The field of education has witnessed its fair share of technology initiatives that failed to live up to their initial billing as transformational (Cuban, 2001), and HyperDocs could prove to be a phenomenon that, while enjoying some niche popularity for a period of time, fails to garner widespread use across the profession.

However, it is possible to imagine that if HyperDocs are designed and used in ways that reflect the ideal defined by Highfill, Hilton, and Landis, then important changes in teaching and learning could actually occur. Additionally, given that HyperDocs can potentially be adjusted for delivery in various ways, they may be useful in contexts where flexibility is necessary, such as the COVID-19 pandemic that recently required schools to quickly shift to remote teaching (Hodges, Moore, Lockee, Trust, & Bond, 2020; Trust, Carpenter, Krutka, & Kimmons, 2020). Therefore, knowledge regarding how and why HyperDocs are used is valuable, particularly given the proliferation of digital devices in schools and related interest in approaches to teaching and learning that leverages those devices. This study indicates that educators’ perceive HyperDocs to be beneficial tools for student agency, creativity, and collaborative learning, and establishes a foundation upon which future research can further delve into the opportunities and challenges associated with this intriguing pedagogical innovation.

CRediT authorship contribution statement

Jeffrey P. Carpenter: Conceptualization, Methodology, Validation, Data curation, Investigation, Formal analysis, Writing - original draft, Supervision. Torrey Trust: Conceptualization, Methodology, Investigation, Formal analysis, Writing - original draft. Tim D. Green: Conceptualization, Methodology, Investigation, Formal analysis, Writing - original draft.

Appendix A

1. How long have you been working in education?
   a. 1–5 years
   b. 6–10 years
   c. 11–20 years
   d. 21–30 years
   e. 31+ years

2. At which type of educational institution do you work?
   a. Public K-12 (non-charter)
   b. Public K-12 charter school
   c. Independent K-12 (private) school
   d. College/university
   e. Other __________________________________________

3. What is your current professional role?
   a. Regular Education Teacher
   b. Special Education Teacher
   c. Instructional Coach
   d. Instructional Technology Facilitator
   e. Higher Education Instructor
   f. Media Specialist/Librarian
   g. Administrator
   h. Other __________________________________________

4. What access to digital technology do your students have AT SCHOOL? (check all that apply)
   - All students have access to a school-provided laptop or tablet (1-to-1).
   - All students have access to a personal device (BYOD).
   - Some, but not all, students have access to a personal device.
   - Students have easy and consistent access to laptop/tablet carts and/or computer labs.
   - Students have some access to laptop/tablet carts and/or computer labs.
   - Students have access to shared classroom computers.
   - Students have very little access to digital technology.

5. Do your students have reliable Internet access AT SCHOOL?
   a. Yes
   b. No

6. Drag the sliders below to the appropriate positions.
7. Grade level focus of your current professional role
   a. Pre-K
   b. Elementary
   c. Middle School/Jr. High School
   d. High School
   e. K-12
   f. Post-secondary
   g. Other ________________________________________________

8. If your work is in K-12 settings, please estimate the percentage of students from your school who are eligible for Free or Reduced Lunch. (This is a common proxy for school poverty levels).
   a. 0–25% (i.e., lower poverty school)
   b. 26–50%
   c. 51–75%
   d. 76–100% (i.e., higher poverty school)
   e. Not applicable

9. Indicate the content area(s) you teach or for which you are responsible. Check all that apply.
   ▢ Mathematics
   ▢ Social Studies/History
   ▢ Science
   ▢ English/Language Arts
   ▢ World Languages
   ▢ Physical Education
   ▢ Health
   ▢ Art
   ▢ Music
   ▢ Special Education
   ▢ ESL/ESOL
   ▢ Career Technical Education (CTE)
   ▢ Media/Library
   ▢ Technology
   ▢ Other ________________________________________________

Indicate the degree to which you agree or disagree with the following statements.

| Statement                                                                 | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree |
|--------------------------------------------------------------------------|----------------|----------------|----------------------------|------------------|-------------------|
| 10. I am an early adopter of technology.                                 |                |                |                            |                  |                   |
| 11. I am an early adopter of new instructional practices.                |                |                |                            |                  |                   |
| 12. I collaborate with other teachers at my school in the creation of    |                |                |                            |                  |                   |
|   curriculum and instructional materials.                               |                |                |                            |                  |                   |
| 13. I collaborate with other teachers from beyond my school in the      |                |                |                            |                  |                   |
|   creation of curriculum and instructional materials.                   |                |                |                            |                  |                   |
| 14. I have freedom in my school regarding what I teach and how I        |                |                |                            |                  |                   |
|   teach it.                                                             |                |                |                            |                  |                   |
| 15. I have technical support in my school.                              |                |                |                            |                  |                   |

16. What is a HyperDoc?
17. How did you first hear about HyperDocs?

18. Drag the sliders below to the appropriate positions.

19. Please indicate where you find HyperDocs that you have used (that you did not create). Check all that apply.
   - http://hyperdocs.co/teachers_give_teachers or http://teachersgiveteachers.net
   - The HyperDoc Handbook by Highfill, Hilton, & Landis
   - Facebook
   - Twitter
   - Google
   - Podcasts
   - Blogs
   - Padlets
   - Professional development workshops or conferences
   - Other ________________________________________________

20. Indicate which factors influence your decision to use or remix a HyperDoc created by someone else.

| Factor                                                                 | Major influence | Minor influence | Not an influence |
|-----------------------------------------------------------------------|-----------------|-----------------|-----------------|
| Someone recommends the HyperDoc to me.                                 |                 |                 |                 |
| The HyperDoc is visually attractive.                                   |                 |                 |                 |
| The HyperDoc addresses content I have not previously taught before.   |                 |                 |                 |
| The HyperDoc aligns with the curriculum I am required to teach.       |                 |                 |                 |
| The HyperDoc includes a lot of activities I think would engage my students. |                 |                 |                 |
| The HyperDoc provides opportunities for student choice.               |                 |                 |                 |
| I previously used a HyperDoc created by the same person(s).           |                 |                 |                 |
| The HyperDoc provides opportunities for technology integration.        |                 |                 |                 |
| Other (text box)                                                      |                 |                 |                 |

21. What percentage of the time in your class are your students using HyperDocs?

Drag the slider to the appropriate percentage.
22. How do you use HyperDocs with your students? (check all that apply)
   ○ To lead into a lesson or unit (e.g., to spark interest) (1)
   ○ For students to explore the topic individually (2)
   ○ For students to collaborate and explore the topic in groups (3)
   ○ For homework (5)
   ○ For enrichment (e.g., students who finish an exam or activity early) (6)
   ○ For formative assessment of student learning (7)
   ○ For summative assessment of student learning (8)
   ○ To flip the classroom (9)
   ○ To provide opportunities for student creativity (11)
   ○ Other (10) ________________________________________________

23. (Optional) Please provide a link to a HyperDoc that you have used with your students and you believe is well designed.

24. What has been the most important positive outcome of your use of HyperDocs?

25. Please tell us about any professional development activities you have engaged in that have helped you teach with HyperDocs.

26. What is the biggest obstacle you have experienced as you have used HyperDocs?

Appendix B

Table A1
Codebook for “What has been the most important positive outcome of your use of HyperDocs?”

| Category                                      | Code                  | Exemplar(s)                                                                                                                                                                                                 | % of Count |
|------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Educator change                               | Professional learning benefit | “We do an Empathy and Inclusion Hyperdoc professional development session that has been extremely well received. It is VERY powerful.”                          | 5          |
|                                               | Enhanced educator community | “It has also lead to a larger PLC for me. I’ve met and collaborated with some great teachers on Twitter and now in real life that I wouldn’t have met if it wasn’t for HyperDocs.” | 4          |
| Pedagogy change                               | Personalization       | “Students are able to be self-paced and I spend more time sitting next to students and checking in with them as well as personalizing their learning through our conversations.” | 18         |
|                                               | Activity/lesson/unit design | “Designing a hyperdoc helps me think more clearly about the learning process and create a lesson that is deliberate and succinct.”                                                                   | 10         |
|                                               | Differentiation       | “Differentiate to meet the needs of all classroom learners, collaboration among students and teachers as well as the ability to present information to build prior knowledge on a topic of study! Also the ability to extend learning and motivate learning.” | 7          |
|                                               | Small group instruction | “It gives me the opportunity to spend my time working in small groups or one on one with my students rather than having to instruct in a whole group lesson.”                                | 3          |
|                                               | Giving students more choices | “Allows student choice in how to show what they know”                                                                                                                                                    | 15         |
|                                               | Pedagogy change (other) | “teacher flexibility”                                                                                                                                                                                      | 18         |
| Student learning process or outcome change    | Student engagement    | “Engaging students while differentiating instruction.”                                                                                                                                                     | 44         |
|                                               | Student autonomy      | “My students can work at different paces and they have a choice when doing projects and finding resources.”                                                                                             | 14         |
|                                               | Student learning outcome | “Student success—all students are reached, have access to content across multiple modalities.”                                                                                                            | 10         |
|                                               | Student collaboration | “There was a lot of excitement from the kids about being able to do creative things.”                                                                                                                     | 10         |
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