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# Digital Storytelling: A District Initiative for Academic Literacy Improvement

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Digital storytelling is increasingly popular in classrooms, but what particular learning benefits and challenges occur when it is implemented widely in a school district?

Many modern students scour YouTube videos to teach themselves, and some even produce their own videos or run their own YouTube channels. With more students exploring new forms of media, schools are looking for effective ways to leverage digital media to enhance student learning (Smith, 2017). The practice of digital storytelling (DST) has attracted much attention in education because of the effective ways in which it motivates and engages students, amplifies their voices and networks, and simultaneously develops both traditional literacies of reading and writing and new literacies of digital production and communication (Cummins, Hu, Markus, & Montero, 2015; Smeda, Dakich, & Sharda, 2014).

Despite its apparent promise, DST has been limited to primarily after-school programs or the classrooms of innovative teachers. Several studies on K–12 technology integration have suggested that district-level factors play a critical part in the successful implementation of digital writing programs such as online multimodal programs (Olmanson & Abrams, 2013) or the use of Google Docs (Yim, Warschauer, & Zheng, 2016). However, no study to date has examined implementation of DST in a school district. With little research on the subject, practitioners, school administrators, and policymakers alike are left to wonder if positive findings in small-scale implementation are the result of master teachers using DST well or if the results can be replicated across a diverse population in a school district. If positive findings can be replicated, another question is how or whether DST should be adopted by the entire system.

To fill the gaps in the literature, we examined a partnership between a school district in Southern California and a nonprofit organization that brings DST to its students through continued professional development, teacher support, and community engagement via annual film festivals. In this article, we present preliminary findings from the first year of a long-term research plan to generate understanding about DST and its implementation in a school district. Three research questions guided this study:

1. Why and how are teachers using DST in the school district?
2. What are the effects of DST on literacy development?
3. What challenges are related to implementing DST across a district?

In this article, we define DST, discuss its use in schools, and explore the challenges of implementing

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technology-related instruction. Finally, we present findings from the first year of this study.

## What Is DST?

In general, DST is a critical form of multimodal composition, which integrates multiple semiotic modes, such as text, speech, visuals, and sound, into both writing processes and products (Kress, 2003; Robin, 2016). The practice of using DST as a form of multimodal composition has attracted much attention in education because of its broader capacity to make and share meaning in multiple modes across different digital formats (Dobson & Willinsky, 2009). The affordances of DST, including increased concentration, motivation, collaboration, and knowledge presentation (Robin, 2016), amplify the meaning that students deliver. DST allows students to leverage the availability of online resources and reflect on their own learning (Yang, 2012). Pairing their writing with multiple semiotic modes is particularly empowering for learners with limited language capacity, as multimodality can create additional layers of meaning and complete the message (Smith, 2017).

### *DST in K–12 Literacy Education*

Even though the potential of DST is not limited by subject matter, content, or curricular objective (Ohler, 2013), the applicability is stronger for those content areas that involve argumentation, explanation, and narrative. Thus, DST has a natural home in English language arts classrooms, where teachers might encourage students to create personal digital stories on challenging topics, such as past experiences with immigration (Robin, 2016) or marginalization (Benmayor, 2008). In addition to personal narratives, students may create digital stories based on novels that they have read (Ohler, 2013) or in lieu of a written essay to demonstrate their understanding of a text (Ballast, Stephens, & Radcliffe, 2008).

What is less established in the literature is the impact of DST integration in culturally and linguistically diverse settings and whether it presents unique affordances for supporting bilingual immigrants. Researchers such as Cummins and colleagues (2015) have argued that DST may be particularly powerful for minority students, as they can leverage their cultural and community knowledge, affirm their bilingual identities, and incorporate their out-of-school interests into their digital stories. However, empirical studies investigating the use of DST among culturally and linguistically diverse students have been rare (e.g., Smeda et al., 2014), and none currently exists at the scale of many teachers in a district simultaneously implementing DST. Given the mandates for districts to implement media literacy into their curriculum (e.g., California Senate Bill No. 830; Stanford History Education Group, 2016), this case study provides much needed insight into how a district with a large Hispanic and bilingual population implemented DST in its classrooms in collaboration with a local nonprofit organization.

### *K–12 Technology Integration Considerations*

Whereas prior research has indicated the promise of DST for literacy education, the importance of district-level support for technology integration affirms the need for empirical studies of district-wide DST integration. For example, research exploring the efficacy of K–12 educational technology integration has noted that multiple contextual factors influence teachers' beliefs, attitudes, and actual use of a technology (Yim et al., 2016). Such teacher-external factors, including availability and access to technology, need to be addressed at the district level and have a significant influence on the level and quality of classroom technology use. A study by Olmanson and Abrams (2013) on an online multimodal writing program revealed that teachers' implementation efforts are contingent upon complex and interrelated factors, including access, administrator support, and district priorities. Likewise, other studies noted that teacher interest in technology integration is closely linked to availability of resources, curricular or cultural alignment, and technical support and training (Rohaan, Taconis, & Jochems, 2012; Schifter, 2008), all of which ultimately are tied to district initiatives.

However, most studies on K–12 technology integration instead have focused on individual teacher or classroom contexts (e.g., Hew & Brush, 2007), with no large-scale DST study conducted prior to the one discussed here. Because DST integration is potentially beneficial for linguistically and culturally diverse students, it is likewise critical that this population be included in research addressing such district initiatives. This exploratory study takes an initial step toward filling this gap in the literature by examining how students, teachers, and research partners experienced large-scale implementation of DST and what implementation challenges were experienced and resolved during this process.

## What We Learned (or Know?) After One Year of Exploratory Research

### *Research Site and Program*

The study took place in the Palm Springs Unified School District (PSUSD), which comprises 23,000 students in a desert area of Southern California. The student population consists largely of Hispanic (76%) and nonnative English speakers (55%) from low-income families (83%).

Through a close partnership with DIGICOM, a nonprofit created by David Vogel, the former president of Walt Disney Pictures, the first film festival was held in 2009. This festival showcased works by both PSUSD students and teachers. Another major product of the partnership has been professional development for DST instruction within the district via weeklong workshops conducted twice a year (January and June) by DIGICOM. These workshops offer four types of classes—Beginning DST, Cinematic Storytelling, Curriculum Integration, and Applied DST—led by DIGICOM staff members, from which teachers choose based on their existing knowledge and training in DST.

### *Data Collection and Analysis*

In April 2015, the then-superintendent of PSUSD reached out to us to propose a research alliance, which was initiated soon thereafter. Since then, this alliance has studied the impact of DIGICOM and PSUSD's existing professional development, with the University of California, Irvine contributing expertise in data analysis and survey development.

For this study, all data were collected from the beginning of summer 2016 through the end of summer 2017. We examined the following sources of data using multiple methods, including qualitative content analysis of interview and observation data and descriptive analysis of survey and self-assessment data.

**Observations**. A member of the research team observed a total of 118 hours of DIGICOM activities and events across the district. These events included the DIGICOM professional development weeks in summer 2016 and winter 2017, and classroom instruction by five PSUSD teachers over the course of the academic year. Teachers were chosen from participants in the summer 2016 workshop. Later, teachers were selected based on purposeful sampling to represent diverse grade levels and school subjects.

**Interviews**. A total of 42 participants were interviewed by a research team member, including district administrators ($n$ = 2), DIGICOM employees ($n$ = 4), community members ($n$ = 2), PSUSD teachers ($n$ = 11), and their students ($n$ = 23) in the focal schools. Participants were first chosen for interviews based on discussions with PSUSD and DIGICOM officials. Snowball sampling was later used to recruit additional participants. The interviews were conducted at the beginning and end of the 2016–2017 school year. Both individual and group interviews (15–30 minutes each) were conducted face-to-face and digitally recorded for transcription. Interviews were semistructured and tailored for each different group of interviewees to gain their unique perspectives on the implementation of DST in the district.

**Surveys**. We administered three teacher and student surveys for this study: teacher self-efficacy with DST, student self-efficacy with technology-related skills, and student learning outcomes self-assessment.

We adapted the 19-item survey of teacher self-efficacy with DST from an existing survey of teachers' self-efficacy using technology in teaching (Wang, Ertmer, & Newby, 2004). This survey was administered via Google Forms in summer 2016 following the DIGICOM workshop and had a 100% response rate ($n$ = 89). The breakdown of participating teacher grade levels was 50.6% elementary, 20.2% junior high school, and 28.1% high school. The subject areas represented in this group of participants were English, math, science, social studies, foreign languages, and art. The teachers are likewise diverse in their experience with DST, with 28.1% having previously taken none of the DST training offered by DIGICOM, 16.9% having taken one of the training classes, 24.7% having taken two classes, 14.6% having taken three, and 15.7% having taken four.

Additionally, we asked teachers to write about their past use of DST and their plans for future use. We coded and analyzed their responses for types of instructional use and quality of description of future use.

The 14-item survey of student self-efficacy with technology was adapted from an extant measure (Mikusa, 2015) and distributed via SurveyMonkey to fifth- ($n$ = 1,362) and eighth-grade ($n$ = 999) students in the district, with a 95% response rate. These grade levels are critical gateways to junior high and high school.

For the third survey, we asked 12th-grade students ($n$ = 43; response rate = 80%) to assess their own level of mastery of 16 learning outcomes described in PSUSD's Expository Reading and Writing Curriculum (ERWC). The focal classroom teacher distributed these paper-based surveys in class at the end of the 2016–2017 school year. We analyzed test scores and survey results using

standard quantitative procedures to determine descriptive frequencies and significance.

In the next three sections, we present findings in three main areas: how and why teachers use DST, benefits of DST, and challenges for successful implementation.

## How and Why Teachers Use DST

To date, 366 unique teachers, representing 30% of the district's teachers, have attended at least one DIGICOM workshop. However, there is no district mandate that teachers must implement DST in their classrooms. Yet, results from the teacher self-efficacy survey indicate that teachers currently use or plan to use DST for five different purposes:

1. *Providing opportunities for students to explore a wider range of multimodal genres, including both fiction and nonfiction:* Examples of such projects include using digital media to tell a personal life story or the biography of a famous person in history or in the field of study.
2. *Developing students' writing skills:* This was accomplished by requiring students to write scripts or outlines of their digital stories.
3. *Motivating students through digital media:* Teachers believed that opportunities for collaboration and use of digital media engaged students in the learning process.
4. *Assessing student learning:* Examples of using DST to assess student learning include capstone DST or video projects in which students have to explain a course concept.
5. *Fostering student connections to their community:* This included projects in which students interviewed people in their community or conducted research on a relevant event or phenomenon in their city.

Additional examples of DST projects across various school subjects are described in Table 1.

The teachers interviewed in this study provided several reasons for their interest in DST adoption, ranging from fostering student engagement via digital technology to seeking new ways for students to demonstrate their learning. Although those reasons may motivate teachers to bring DST into their classrooms, we found that, as with other technology in instruction, support and training continue to play a major role in adoption decisions. Next, we discuss how PSUSD provides support and training to its teachers.

### *Support*

Through interviews with PSUSD teachers and administrators, as well as DIGICOM employees, we found that DIGICOM provides much needed support to help teachers implement DST. This support has emboldened initially hesitant teachers to try DST and encouraged those teachers with technological expertise to be more daring in their approaches to DST. The PSUSD supports its teachers in several ways, including providing access to technology and facilities at the district office, stipends for DIGICOM professional development participation, and a dedicated technology specialist in the district office.

In addition to the professional workshops in the summer and during winter break, interview and observational data reveal that DIGICOM provides various

Table 1
Examples of Digital Storytelling Projects Across School Subjects

| English language arts | Social studies/history | Art/photography | Math/science |
|---|---|---|---|
| ■ Re-creating a scene from a book<br>■ Personal story/ self-introduction<br>■ Capstone project<br>■ Biography of a famous writer<br>■ Research report<br>■ Documentary<br>■ Book report | ■ Documentary on the community or a historical event<br>■ Interviews with community members<br>■ Retelling a historical event or story<br>■ Campaign commercial | ■ Biography of a famous artist<br>■ Portfolio of works produced in a class<br>■ Explanation of an art concept | ■ Demonstration of a problem-solving process<br>■ Capstone project<br>■ Biography of a famous scientist<br>■ Explanation of a math/ science concept<br>■ Research report<br>■ Community research project<br>■ Public safety announcement<br>■ Lab safety video |

forms of support for teachers' implementation of DST. DIGICOM funds grants for equipment and extensive technical support, including a direct phone line to support staff who will visit classrooms upon request. During these visits, support staff might demonstrate use of video production equipment or an element of a video-editing software, assist teachers with project development, or give students feedback on their projects. In addition, DIGICOM facilitates after-school DST clubs and Saturday salons for teachers to exchange ideas with other practitioners in the district.

### *Training*

A previous study suggested that the DIGICOM training increased teachers' self-efficacy in DST implementation significantly (Zhou et al., 2017). For teachers who had prior training, long-term professional development continues to promote their self-efficacy in DST. However, teachers usually do not implement DST without prior training. Responses to the teacher self-efficacy survey indicate that the number of DIGICOM workshops teachers attend is associated with their use of DST. For teachers with no prior training, the likelihood of using DST in instruction was less than 50%. For teachers with one to four years' experience of previous training, the use of DST in instruction increases from 67% to 100%. These data continue to show the importance of long-term technology-supported professional development (Olmanson & Abrams, 2013). More importantly, they offer guidance to districts on the number of workshops teachers might need before implementing DST projects.

## Benefits of DST

In examining the benefits of DST use, we focused on three main benefits that have been explored in prior work on DST instruction but at the classroom or individual level: promotion of 21st-century learning, support for language and literacy development, and positive student identities through the linking of school, community, and culture.

### *21st-Century Learning*

To understand the impact of DST on 21st-century literacies, we analyzed the technology self-efficacy survey administered by the district to fifth- and eighth-grade students. Students in both grades were given the same survey, but fifth graders were shown a poster to explain difficult concepts found in the survey.

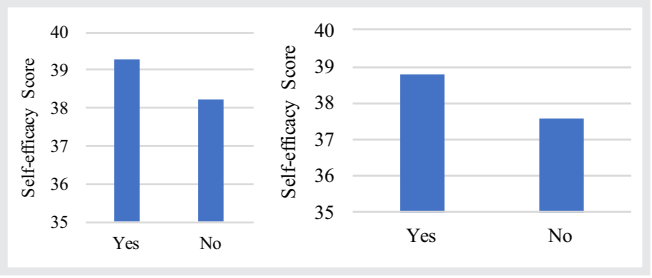
Descriptive statistics revealed that both fifth- and eighth-grade students who created digital stories in their classes had significantly higher technology self-efficacy than their peers who did not (see Figure 1). We also found that participation in the DIGICOM film festival was associated with higher scores in technology self-efficacy.

We theorize that higher self-efficacy scores among those students involved in DST could be attributed to their constant engagement with the digital tools used to create digital stories. Classroom observation data show that during the process of creating digital stories, students were likely to use or experience 12 different pieces of digital hardware or filmmaking equipment and 15 software or web applications or services, on average. Also, students were likely to use digital tools and equipment along with software and web applications to perform a variety of tasks, including video and photo editing, web researching, uploading and downloading images, audio recording and editing, digital attributions, providing comments on classmates' projects, troubleshooting, and assessing and mitigating technical breakdowns or hardware and software incompatibilities.

Beyond general skills with technology, observation data showed that a considerable number of the 12th-, eighth-, and even fifth-grade students' projects indicated mastery of the grades 9–12 advanced California visual arts standards (California State Board of Education, 2001):

> 2.4 Demonstrate in their own works of art a personal style and an advanced proficiency in communicating an idea, theme, or emotion.
>
> 2.5 Use innovative visual metaphors in creating works of art.
>
> 2.6 Present a universal concept in a multimedia work of art that demonstrates knowledge of technology skills. (p. 156)

Figure 1
Self-Efficacy With Technology Scores by Students Who Made a Movie in Class and Those Who Did Not: Fifth Graders (left) and Eighth Graders (right)



### Language and Literacy

To understand how district training is translated to actual practice and its effects on student learning, we conducted a small case study in one participating 12th-grade English language arts class in which the teacher is also a DIGICOM trainer. Although DST is used to teach various subjects in the PSUSD, prior work indicated that DST is particularly effective for student learning in English language arts classrooms (Angay-Crowder, Choi, & Yi, 2013). On a weekly basis for two months, we observed two classes taught by the same teacher using the same ERWC curriculum for both classes. The ERWC unit required students to read the book *1984* by George Orwell, take weekly content-related quizzes developed by the teacher, and complete a final assessment. For the assessment, both classes were required to respond to a prompt provided by the ERWC: "How close are we as a nation to becoming a society monitored, and therefore controlled by the government? Compare and contrast the fictional scenario of Orwell's *1984* to citizen surveillance practices in the United States." The treatment class created a digital story to address the prompt instead of writing an essay.

We compared these classes through interviews, observations, and an ERWC-developed survey. Conclusions were drawn by a comparative method that analyzed qualitative and quantitative data. We summarize the findings in Table 2. A more detailed description of the areas of comparison between the two classes follows.

Students in both classes were interviewed and asked to recall information from the book *1984*, give their opinions on the characters, and draw parallels between events in the book and contemporary events. The data suggest that students who made digital stories were able to discuss the book more fluidly with one another and with the interviewer than those students who wrote essays. One student in the DST class provided a possible explanation for this phenomenon in stating that "making a video force[d] me to read more of the book." In addition to reading more, students "had to do it many times," reported another interviewee. On average, students in the DST class appeared to retain information about their reading longer. In the interviews, students in the DST class discussed the characters and vocabulary from the book at great length. In contrast, students in the essay class recalled fewer details about the characters and vocabulary and, in some instances, completely forgot this information shortly after the unit.

Students also rated their own learning outcomes in an ERWC survey, which asked students to assess their mastery of learning outcomes articulated by the ERWC curriculum developers. Descriptive statistics for the survey data showed that students in the DST class scored themselves highest in two areas: ability to analyze an author's assumptions and appeals, and ability to consider new ways of thinking. Interestingly, students in the business-as-usual class scored themselves lowest in those same two areas. Additional comparison of high and low scores between the two classes revealed that students in the DST class were more persistent during difficult academic tasks but less confident in their ability to complete tasks related to writing.

These findings suggest that writing and DST assignments play important and complementary roles, with DST assignments strengthening overall engagement and depth of learning and writing assignments being critical to developing writing ability.

### Positive Student Identities Through the Linking of School, Community, and Culture

In the PSUSD, English learners are highly represented. This group of students is at a disadvantage due to a variety of reasons that could include their lack of familiarity with the academic literacies or discourses practiced in schools, in addition to identity devaluation (Cummins et al., 2015). Cummins and colleagues argued that the academic trajectory for many of these students can be

Table 2
Summary of the Student Learning Assessment in 12th-Grade English Language Arts: Digital Storytelling Versus Business-as-Usual (Essay) Classes

| Class | Discussion | Retention | Engagement | Content knowledge | Analysis | Persistence | Writing |
|---|---|---|---|---|---|---|---|
| Digital storytelling | + | + | + | = | + | + | |
| Business as usual | | | | = | | | + |

*Note.* A + indicates the learning outcome in which one class outperformed the other; a = indicates that both classes were similar in the outcome measure.

altered when instruction connects to students' lives by activating their background knowledge, interests, and aspirations and when instruction enables students to carry out challenging academic work that affirms their identities. Of the nearly 2,000 students who completed at least one digital story in their classes, some incorporated both Spanish and English. We examined two videos created by those students to understand how DST supported literacy development for English learners. The videos were publicly available on YouTube through the DIGICOM channel. One digital story (see Figure 2) chronicles the experiences of the filmmaker's grandfather as a *bracero*, a hired hand brought in from Mexico to work on farms in the United States. The second digital story (see Figure 3) is a poem written and read by a student to his mother.

Through the lens of identity texts, we conducted textual (Koski & Weis, 2004) analyses of these videos. Cann (2015) defined textual analysis as "looking at language use and the construction of meaning through imagery" (p. 295). The analyses revealed that when pedagogy explicitly challenges students to produce identity texts, they experience unique learning opportunities by bridging languages, cultures, generations, and communities.

In the first digital story, "*Mi Abuelo Fue Bracero*" (My Grandfather Was a U.S. Farm Worker), the student chose to tell the story first in English, then using the words of his grandfather, other *braceros*, and an activist shown in the film to complete the story in Spanish. Through subtitles, the student engaged English-speaking audience members in the story of *braceros*, a salient topic in the largely Hispanic Palm Springs community. In the second digital story, "Best Mother Ever," the student expressed

Figure 2
Screenshot From the Student Video "*Mi Abuelo Fue Bracero*" (My [Mexican] Grandfather Was a [U.S.] Farm Worker)


*Note*. The color figure can be viewed in the online version of this article at http://ila.onlinelibrary.wiley.com.

Figure 3
Screenshot From the Student Video "Best Mother Ever"

*Note*. The color figure can be viewed in the online version of this article at http://ila.onlinelibrary.wiley.com.

his love for his mother by reading a poem written in English and Spanish. We noted that he integrated his mother's pictures and her life story as he made connections between his mother's love and his own daily experiences. Through these digital stories, students braided multilingual and multimodal material (Zapata, 2014), leveraged cultural and community knowledge, and incorporated out-of-school interests. This bridging of languages, cultures, generations, and communities was found not only in students' completed digital story projects but also throughout the process of creating them. Students engaged in bridging activities as they conducted research, interviewed family members, interacted in the local community, shared their ideas with their classmates, and finally, showcased their digital stories either online or at school-sponsored film festivals, which further validated the strong home, school, and community resources involved in digital story productions.

## Challenges of Implementing DST

Although a previous study (Zhou et al., 2017) found that DIGICOM training significantly increases teachers' self-efficacy in using DST, the survey data, teacher interviews, and classroom observations presented in this article indicate that challenges to implementation remain. Despite PSUSD teachers still facing familiar challenges to implementation, such as access to technology and insufficient technological skills (see Table 3), nearly 2,000 students in the district still made at least one digital story in their classes. Those numbers indicate that for a district like PSUSD, the familiar challenges might not be so formidable. Rather, data suggest that the larger obstacle to wide-scale implementation might be connected to the curriculum.

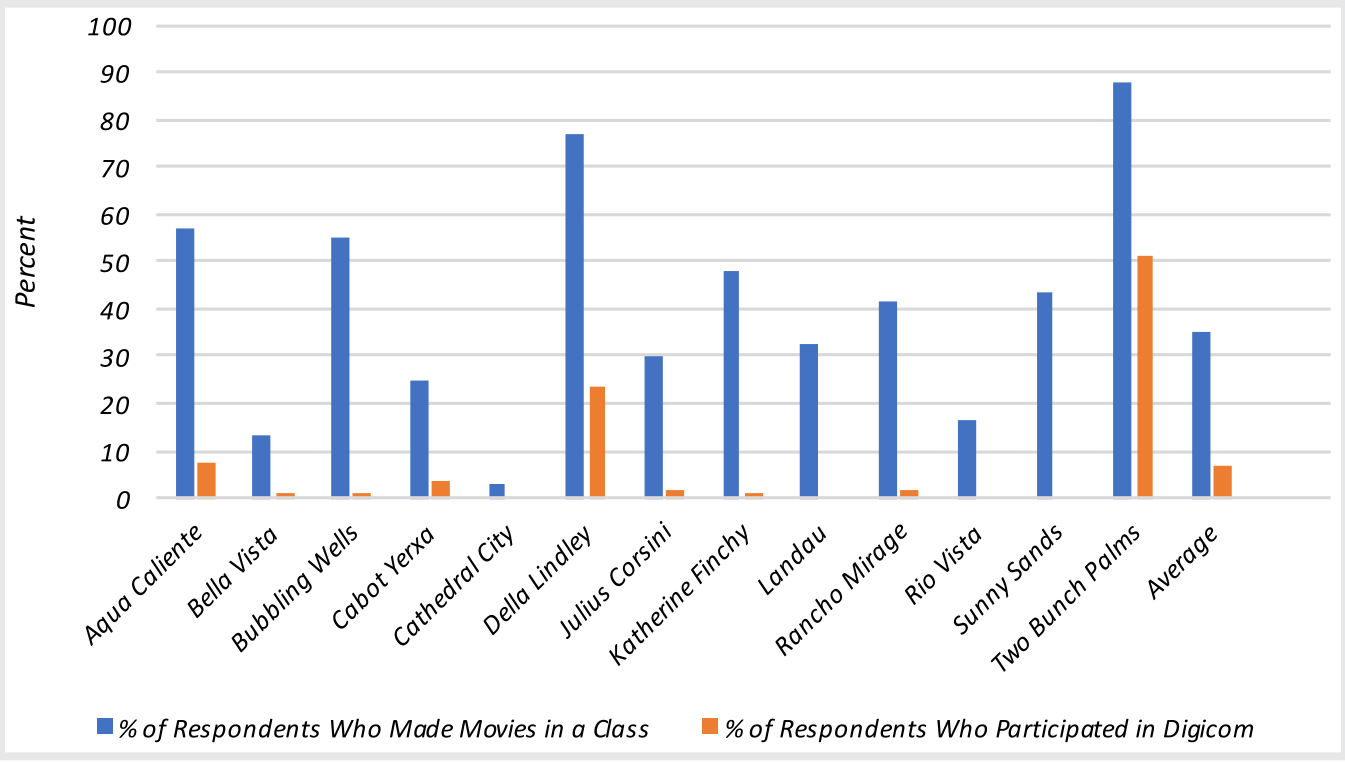
Table 3
Main Challenges Faced by Teachers and Students When Implementing Digital Storytelling, as Reported by Teachers

| Insufficient technology tools | Limits in users' skills |
|---|---|
| Lack of access to technology:<br>■ Need up-to-date technology<br>■ Lack of technology for creating digital stories: iPads, recording equipment, and video-editing software<br>■ No access to technology used during teacher training<br>■ Lack of student access to technology at home<br>■ Lack of access to an internet connection<br>Reliability of technology:<br>■ Unstable internet connection<br>■ General technology problems | Teachers:<br>■ Lack of video-editing skills<br>■ Lack of general skills necessary for creating digital stories<br>Students:<br>■ Lack of technology skills for editing videos and images<br>■ Misuse or inappropriate use of technology |

Data from the survey on student self-efficacy with technology indicate that approximately 35% of all fifth- and eighth-grade students had the opportunity to create digital stories in their classes. Approximately 7% of the fifth-grade students and 5% of the eighth-grade students reported participating in the DIGICOM film festival (see Figures 4 and 5).

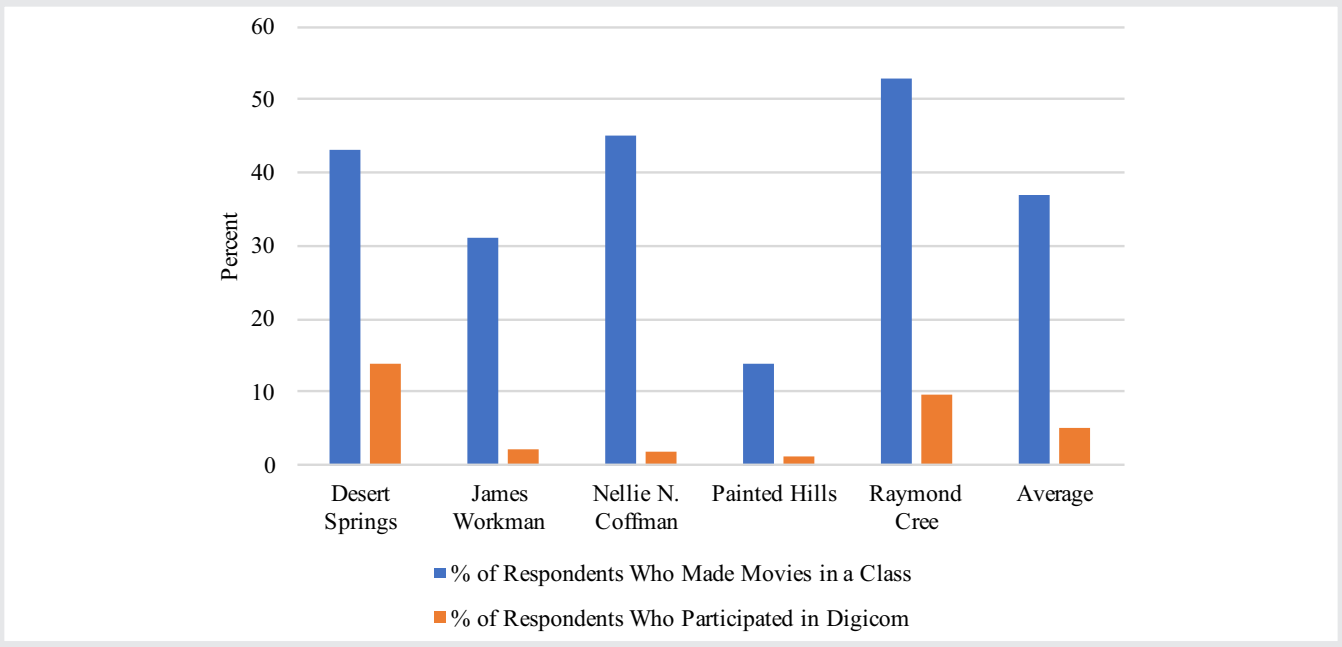
We also examined what percentage of total DST activity in the district took place at individual schools (without accounting for the different number of students at each school). Of the fifth-grade students who reported making a movie in class, the majority (65%) came from only five of the 13 elementary schools. Also, of the fifth-grade students who reported participating

Figure 4
Percentage of Fifth-Graders, by Elementary School, Who Reported Making a Movie in a Class and Participating in the DIGICOM Film Festival




*Note*. The color figure can be viewed in the online version of this article at http://ila.onlinelibrary.wiley.com.

Figure 5
Percentage of Eighth Graders, by Middle School, Who Reported Making a Movie in a Class and Participating in the DIGICOM Film Festival




*Note*. The color figure can be viewed in the online version of this article at http://ila.onlinelibrary.wiley.com.

in the DIGICOM film festival, the majority (85%) came from only two elementary schools.

For all the eighth-grade students who reported making a movie in class, participation percentages were more evenly distributed across the five middle schools in the district. Also, for the students who reported participating in the DIGICOM film festival, two of the six middle schools accounted for almost 80% of all participation. Findings indicate that DST implementation is uneven within the district and that interested teachers may need guidance to integrate DST into a curriculum that is already full.

## Discussion and Implications

This was an exploratory study appropriate for the first year of a larger research plan. The goal was to capture the various ramifications of DST as it was implemented in the district and its impact on student learning. Findings to date indicate very positive trends for DST. Teachers who participated in professional development reported improvement in their knowledge, skills, and self-efficacy for DST and feeling well supported in their endeavors. As a result, PSUSD teachers have implemented DST across grade levels and school subjects. The digital stories created in these classrooms showcased tremendous student creativity and talent and demonstrated the potential for this instructional practice to help students develop the skills, knowledge, and competencies associated with 21st-century learning and English language arts. Additionally, findings suggest that the diverse students who participated in DST were able to develop positive identities through the linking of school, community, and culture and develop an understanding of curricular content that is unique to DST. Despite DST being a promising practice, challenges to increasing its use across a district remain.

For schools and districts looking to implement DST, the findings from this exploratory study can serve as guidance. First, they demonstrate the importance of partnerships in DST programs. Second, they provide clues as to how districts and partners can support a DST program, which could include incentives for workshop attendance, peer support, and district guidance. Finally, the findings propose a plausible timeline for expected teacher implementation of DST projects, which could serve districts as they prepare their professional development workshops.

However, understandably, not all districts have the opportunity or means to form partnerships. For districts that lack a long-term partnership with a well-funded, nonprofit organization such as DIGICOM, we believe that leveraging peer support such as the salons model created by DIGICOM, development of a detailed articulation of district curriculum and objectives, and an

## TAKE ACTION!

1. Provide ample professional development opportunities for teachers not only in DST techniques but also in technical operations of digital devices and the appropriate use of technology related to DST. Teachers' own production of DST will help strengthen their technology skills, such as in video editing, and their design tool training for students.
2. Consider the alignment between the district's goals and how the use of DST can serve those goals.
3. District officials need to develop a framework for implementation consistent with an articulation of institutional goals. This articulation and framework could presumably spell out which teachers in which subjects and grade levels are expected to integrate DST and in which ways, thus providing professional development consistent with district-wide goals.
4. For effective communication among teachers, consider providing a collaborative online space across subjects and grade levels. This cross-curricular collaboration can provide effective ways for teachers to connect with others, share their resources and examples, and learn from one another's trials and errors.

integration framework consistent with this articulation are important steps to DST implementation. Through these steps, district leaders can provide better directions to teachers about how and when to integrate DST and thus bring its benefits more consistently to larger numbers of students.

### NOTE

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## MORE TO EXPLORE

- DIGICOM: https://digicomlearning.com/
- StoryCenter: https://www.storycenter.org/
- University of Houston's Center for Digital Storytelling: http://digitalstorytelling.coe.uh.edu/