common sense®

**2019**

# THE COMMON SENSE CENSUS:
## INSIDE THE 21ST-CENTURY CLASSROOM

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## CREDITS

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# TABLE OF CONTENTS

EDUCATIONAL TECHNOLOGIES CONTINUE TO be integrated and embedded into school districts, changing how teachers and students work and learn. Previous research has examined the many ways in which schools are evolving, including understanding what products teachers are using, how socioeconomic status relates to classroom technology access, and the barriers teachers face in integrating technology effectively (e.g., Bill and Melinda Gates Foundation, 2015[1]; Blackboard and Speak Up, 2017[2]; and Takeuchi and Vaala, 2014[3]). However, much remains to be learned about classroom technology use. Common Sense, working with Rockman et al, set out to learn more about the state of the 21st-century classroom by surveying classroom teachers about their experiences and attitudes around educational technology. Teachers provide a wealth of knowledge about the impact of educational technology in their classrooms. This report examines how K–12 teachers across the U.S. are currently using educational technology tools with students in their classrooms and what impacts on learning they are observing, with consideration given to students' broader learning contexts.

Using the results of a nationally representative survey of over 1,200 K–12 teachers, this report covers four main topic areas:

- **Digital citizenship curricula and competencies.** In a digital world, the skills needed to think critically and engage online in a safe and responsible manner are highly important. Yet little research has examined the extent to which U.S. teachers are engaging in classroom practices to develop students' digital citizenship competencies. The present study examines the prevalence of teaching and perceived effectiveness of digital citizenship competencies and the use of digital citizenship resources.

- **K–12 teachers' usage of digital tools and perceptions of their effectiveness for student learning.** The impact of educational technology on learning often depends on the context in which, and purpose for which, the technology is used. Teachers' usage of and perceptions of the effectiveness of various types of educational technology tools are examined, while considering the contexts of teaching and learning.

- **Access to technology for classroom learning.** What does students' access to technology devices for classroom learning at home and at school look like? Classroom teachers also report on how their students' access affects their ability to do homework, as well as the nature of parent-teacher communications about classroom technology.

- **Technology-integration policies.** To understand how technology is used in the classroom, school policies related to educational technology are examined, especially in the context of teachers' technology-related concerns.

With this report, we hope to shed light on the state of educational technology in U.S. classrooms, with a goal of helping teachers, administrators, school districts, and others who have a stake in children's education make smart, evidence-based decisions on what is most effective for students.

1. Bill and Melinda Gates Foundation. (2015). *Teachers know best: What educators want from digital instructional tools (2.0).* Seattle, WA: Bill and Melinda Gates Foundation. Retrieved from http://k12education.gatesfoundation.org/resource/what-educators-want-from-digital-instructional-tools-2-0/

2. Project Tomorrow. (2017). *2017 digital learning report.* Retrieved from https://tomorrow.org/speakup/speak-up-2016-trends-digital-learning-june-2017.html

3. Takeuchi, L., and Vaala, S. (2014). *Level up learning: A national survey on teaching with digital games.* New York, NY: Joan Ganz Cooney Center. Retrieved from http://joanganzcooneycenter.org/publication/level-up-learning-a-national-survey-on-teaching-with-digital-games/

## 1
### Digital citizenship is being taught in a majority of schools.

Approximately six out of 10 U.S. K–12 teachers used some type of digital citizenship[4] curriculum or resource with students in their classrooms, while approximately seven out of 10 taught at least one type of digital citizenship competency. The most commonly addressed topic areas were digital drama, cyberbullying, and hate speech (taught by 46 percent of teachers), followed by privacy and safety (taught by 44 percent of teachers). Among those teachers who taught any type of digital citizenship competency, nearly six out of 10 did so at least monthly.

## 2
### Teachers believe digital citizenship is effective in helping students make smart, safe, and ethical decisions online.

Among teachers who used any type of digital citizenship curriculum in their classrooms, an overwhelming majority (91%) said it was at least "moderately" effective, including approximately half (52 percent) who said it was "extremely" or "very" effective in helping students make smart, safe, and ethical decisions online. Only 10 percent said it was "slightly" or "not at all" effective.

## 3
### Teachers worry about their students' ability to critically evaluate online content.

Teachers' top technology-related concern was that "students lack skills to critically evaluate online information," which 35 percent observed "frequently" or "very frequently" in their classrooms. Relatedly, news and media literacy was the fourth most taught digital citizenship competency. The second top concern was that "technology distracts students from the learning experience and interferes with learning," reported by 26 percent of teachers as "frequent" or "very frequent" in their classrooms. This issue was also reported more often as grade levels increased.

## 4
### More than a quarter of high school teachers report sexting as an issue.

Twenty-seven percent of high school teachers reported that sexting occurred in their classrooms at least occasionally, compared to 19 percent of middle school teachers, 5 percent of third- through fifth-grade teachers, and 9 percent of kindergarten through second-grade teachers.

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4. Defined in the survey as "thinking critically, behaving safely, and participating responsibly in the digital world."

# 5

## Video is the king of edtech in the classroom.

Video-streaming services (e.g., YouTube, SchoolTube, Netflix) were the most commonly used type of digital tool, used by approximately 60 percent of K–12 teachers with students in their classrooms. Productivity and presentation tools (e.g., Google G Suite for Education, Microsoft Office) constituted the second most common type of digital tool, used by approximately half of teachers with their students. The least used digital tools were tools for well-being and health (25 percent), digital creation tools (25 percent), and social media (13 percent).

# 6

## Teachers place a high value on digital creation tools in developing 21st-century skills, but these tools are among the least used in the classroom.

Productivity and presentation tools (e.g., Google G Suite, Microsoft Office), digital creation tools (e.g., iMovie, Photoshop, Scratch), and learning management systems (e.g., Google Classroom, Canvas, Moodle) were rated by teachers as the most effective digital tools for developing students' 21st-century skills in communication, collaboration, critical thinking, and/or creativity. While productivity and presentation tools were used in about half of classrooms, digital creation tools were only used in 25 percent of classrooms.

# 7

## The gap between the edtech products teachers use and what they say is effective is real and cuts across subjects.

For example, ELA teachers rated productivity and presentation tools and assistive technology as the most effective types of digital tools for developing ELA content knowledge and skills, but they often used other digital tools that they rated as less effective with greater frequency. Similarly, math teachers rated supplemental apps or websites as the most effective digital tools for developing students' content knowledge and skills in math, but they used them less often than many other digital tools that they rated as less effective.

# 8

## Many teachers are not receiving effective professional development (PD) to support their use of educational technology.

Only four out of 10 teachers considered the PD they received to support their use of educational technology to be "very" or "extremely" effective.

# 9

## Many technology products purchased by schools and districts go unused.

Approximately one-third of teachers said that they did not, or practically never, used a technology product that was provided to them by their school or district. Top reasons for not using such products were that they were not relevant to students' learning needs, not engaging for students' learning, or not effective for developing students' knowledge and/or skills.

# 10

## Home access to technology continues to be a challenge for teachers and students in schools serving lower-income students.

Approximately one out of 10 teachers (12 percent) reported that the majority of their students (61 percent to 100 percent) did not have home access to the internet or a computer. These teachers were more likely to teach in Title I schools or schools serving predominantly students of color. This may have been a challenge because, as grade levels increased, teachers were more likely to assign homework that required access to digital devices and/or broadband internet outside of school. Teachers of grades 6–12 were more likely than teachers of grades K–5 to assign homework at least once a week that required access to digital devices and/or broadband internet outside of school (41 percent of high school teachers and 34 percent of middle school teachers vs. 23 percent of grade 3–5 teachers and 20 percent of K–2 teachers).

# 11

## Teachers who assign homework that requires access to digital devices and/or broadband internet outside of school are more likely to teach in affluent, non-Title I schools than in Title I schools.

Approximately four out of 10 teachers (42 percent) in Title I schools "never" assigned homework that required digital access outside of school, as compared to three out of 10 (31 percent) of teachers in non-Title I schools who "never" did so. This is a greater issue as children enter middle and high school and teachers are more likely to assign homework that requires computers and the internet.

# 12

## Approximately a third of teachers (29 percent) said that it would limit their students' learning "a great deal" or "quite a bit" if their students didn't have home access to a computer or the internet.

Teachers in schools with student populations of predominantly students of color were more likely to say that it would limit their students' learning "a great deal" or "quite a bit" if their students did not have adequate access to broadband internet or a computing device at home to do homework (34 percent), as compared to teachers in schools with a mix of white students and students of color or teachers in schools with predominantly white students (26 percent vs. 27 percent, respectively).

TO DEVELOP THE NATIONAL survey, Rockman et al conducted three focus groups with nine teachers from the Midwest region. The nine participants were asked to complete a draft survey in advance of the focus group and to provide qualitative feedback about how well response options captured a broad variety of technology-integrated practices; whether survey items were easy to understand, interpret, and answer; how close-ended responses could be improved; and where open-ended questions or response options were needed.

The online questionnaire was designed to take 20 minutes and administered to a nationally representative sample of 1,208 U.S. K–12 teachers in May 2018 by Rockman et al and national survey sampling consultants Peter Gold, Jordan Losen, and Joe Citoli (VeraQuest Inc.). Random-probability sampling of a national teacher database was used with sampling quotas to provide an even distribution of teachers from four grade-band levels and to reflect trends in the national teacher population based on the most recently available NCES statistics (NCES, 2017)[5]. The sample was constructed from a combination of U.S. Census data and data from the National Center for Educational Statistics (NCES) to be representative of the teacher population and the students they teach. Targets were based on census divisions, the race/ethnicity of students, Title 1 status of schools, and school type (public vs. private). Targets were also set by grade groupings and residential status of the student population. A common rim-weighting technique (i.e., iterative proportional fitting) adjusted sample proportions to resemble the proportions of the target population. The margin of error was plus or minus 3 percent (95 percent confidence interval).

Aggregated and disaggregated results were analyzed and reported for each of six key characteristics:

- Grade-band level
  (four levels: K–2, 3–5, 6–8, 9–12)

- Average years in the classroom
  (four levels: 1–5 years, 6–10 years, 11–20 years, 21+ years)

- Regional context
  (three categories: rural, urban, suburban)

- Racial/ethnic diversity at teachers' schools
  (three categories: *predominantly white* [75%+ white], *diverse* [26%+ students of color and less than 75% white], *predominantly students of color* [75%+ students of color])

- Title I status
  (Title 1 or non-Title 1)

- Subject area taught
  (eight categories: science, math, English language arts, social studies, fine arts, foreign language, physical education, other)

Differences in responses according to school or teacher characteristics were reported for significant differences based on t-tests using a *p* value of < .05 and percentage point differences greater than 5 points.

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5. National Center for Education Statistics. (2017). *The condition of education 2017* (No. 2017–144). Retrieved from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2017144

THE COMMON SENSE CENSUS: INSIDE THE 21ST-CENTURY CLASSROOM   5

# TEACHER AND SCHOOL CHARACTERISTICS

TEACHER RESPONDENTS WERE PRIMARILY female, with an average of 13 years of teaching experience. Subject areas most commonly taught by respondents were English language arts, math, social studies, and science (57 percent, 48 percent, 41 percent, and 38 percent, respectively). The subjects least commonly taught were fine arts, physical education, and foreign language (14 percent, 11 percent, and 5 percent, respectively) (Table 1).

Approximately half of respondents taught in a suburban region, with the remainder in urban and rural settings (26 percent and 25 percent, respectively). Four out of 10 teachers said they taught in schools where approximately 75 percent or more of the students were white. Most respondents taught in public schools (85 percent), most of which were Title I schools (58 percent), as reported by respondents.

*Title I status, race/ethnicity, and regional trends.* Respondents teaching in rural and urban settings were more likely to report that their schools had Title I status than respondents teaching in suburban settings (70 percent and 69 percent vs. 46 percent, respectively). Respondents teaching in schools serving predominantly students of color were more likely to report having Title I status than those in schools serving predominantly white students or in schools serving students of color and white students (75 percent with Title I status vs. 45 percent or 55 percent, respectively).

*Race/ethnicity and regional trends.* Teachers in rural schools most often reported that their schools had predominantly white students (i.e., 75 percent or more students were white). Among teachers in rural schools, 42 percent taught in schools serving predominantly white students, 23 percent taught in schools serving students of color and white students, and 11 percent taught in schools serving predominantly students of color.

**TABLE 1. Teacher and school characteristics**

| Teacher Characteristics | | |
|---|---|---|
| **Number of K–12 teachers surveyed** | | 1,208 |
| **Grade level taught** | • K–2 | 23% |
| | • 3–5 | 23% |
| | • 6–8 | 23% |
| | • 9–12 | 31% |
| **Average number of years teaching** | | 13 |
| **Teacher gender** | • Female | 87% |
| | • Male | 14% |
| **Subject areas taught** | • English language arts | 57% |
| | • Math | 48% |
| | • Social studies | 41% |
| | • Science | 38% |
| | • Fine arts | 14% |
| | • Physical education | 11% |
| | • Foreign language | 5% |
| | • Other | 16% |
| **School Characteristics\*** | | |
| **Type of school** | • Public | 85% |
| | • Private | 10% |
| | • Charter | 5% |
| **Regional setting** | • Suburban | 49% |
| | • Urban | 26% |
| | • Rural | 25% |
| **Racial/ethnic diversity** | • 75%+ white students | 43% |
| | • Diverse (26%–74% white) | 33% |
| | • 75%+ students of color | 24% |
| **Title I status** | • Title I (high poverty) | 58% |
| | • Non-Title 1 (non-high poverty) | 31% |
| | • Unsure | 11% |

\*Characteristics of respondents' schools as reported by teacher respondents.

Notes: "Students of color" includes the racial/ethnic categories of "minority students" in the U.S. Department of Education's Public Elementary/Secondary School Universe Survey (2014–2015) from the National Center for Education Statistics' Common Core of Data (CCD). These "minority students" include "students who are Black, Hispanic, Asian, Pacific Islander, American Indian/Alaska Native, and of two or more races." According to *The Condition of Education 2017* (McFarland et al., 2017), racial/ethnic diversity in U.S. K–12 public schools can be categorized according to the proportion of students who identify as white vs. the racial/ethnic category collectively termed "minority" by the NCES. Based on this approach, approximately 30 percent of public U.S. K–12 schools had 75 percent or more of its students identify as "white," approximately 40 percent of public U.S. K–12 schools had 26 percent to 74 percent of its students identify as "white," and approximately 30 percent of public U.S. K–12 schools had 25 percent or less of its students identify as "white" (with the remainder of students in these schools identifying as racial/ethnic groups collectively termed "minority" by the NCES).

Teachers in urban schools most often reported that their schools had predominantly students of color (i.e., 75 percent or more were students of color). Among teachers in urban school settings, 47 percent taught in schools that had predominantly students of color, 22 percent taught in schools that had students of color and white students, and 10 percent taught in schools serving predominantly white students. Finally, teachers in suburban school settings were most likely to report that their schools had mixed student populations with students of color and white students (i.e., more than 25 percent students of color and more than 25 percent white students). Among teachers in suburban schools, 55 percent reported that their schools had a population of white students and students of color, 48 percent reported that their schools had predominantly white students, and 42 percent reported that their schools had predominantly students of color.

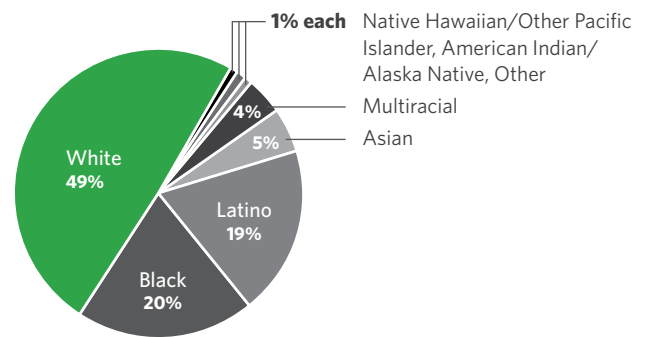**FIGURE 1. Teacher and school characteristics**

RACIAL/ETHNIC DIVERSITY
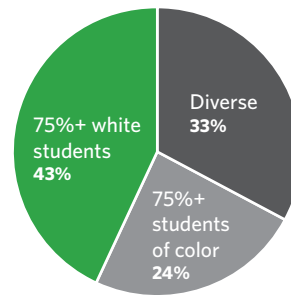
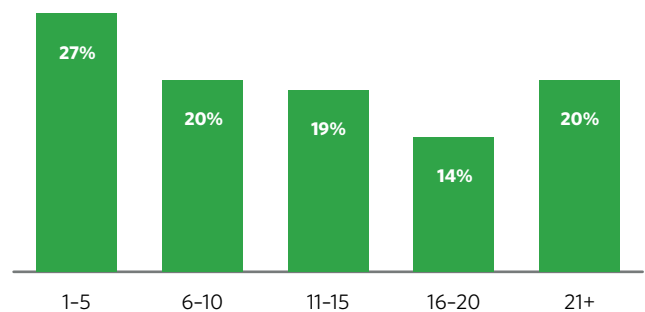

REGIONAL SETTING
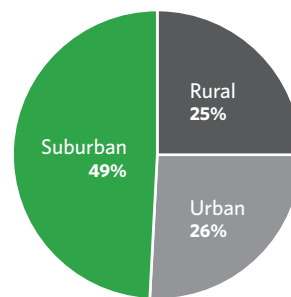


RACIAL/ETHNIC COMPOSITION OF STUDENTS



YEARS OF TEACHING EXPERIENCE



Note: See page 5 for further definition of demographic groups.

# DIGITAL CITIZENSHIP CURRICULA AND COMPETENCIES

## HIGHLIGHTS

- Approximately six out of 10 U.S. K–12 teachers used some type of digital citizenship curriculum or resource with students in their classrooms, while approximately seven out of 10 taught at least one type of digital citizenship competency. The most commonly addressed areas were digital drama, cyberbullying, and hate speech (taught by 46 percent of teachers), followed by privacy and safety (taught by 44 percent of teachers). Among those teachers who taught any type of digital citizenship competency, nearly six out of 10 did so at least monthly.

- Among teachers who used any type of digital citizenship curriculum in their classrooms, approximately half (52 percent) said it was "extremely" or "very" effective in helping students make smart, safe, and ethical decisions online. Only 10 percent said it was "slightly" or "not at all" effective.

- Teachers in Title I schools were more likely to use digital citizenship curricula or resources than teachers in more affluent schools (62 percent of teachers in Title I schools vs. 52 percent of teachers in non-Title I schools). However, there were no differences in the frequency of teaching digital citizenship competencies according to Title I status.

- Teachers in schools with more diverse student populations were more likely to use digital citizenship curricula or resources (61 percent) than teachers in schools with predominantly white student populations (50 percent). Similarly, teachers in schools with more diverse student populations were more likely to teach digital citizenship competencies (75 percent), as compared to teachers in schools with predominantly white student populations (66 percent).

- Teachers' top technology-related concern was that "students lack skills to critically evaluate online information," which 35 percent observed "frequently" or "very frequently" in their classrooms. Relatedly, news and media literacy was the fourth most taught digital citizenship competency. The second top concern was that "technology distracts students from the learning experience and interferes with learning," reported by 26 percent of teachers as "frequent" or "very frequent" in their classrooms. This issue was also reported more often as grade levels increased.

- The frequency of both cyberbullying and online hate speech increased with grade level, with middle and high school teachers reporting higher frequencies of cyberbullying and online hate speech than elementary school teachers. Approximately one out of 10 teachers (13 percent) said that cyberbullying occurred in their classrooms "frequently" or "very frequently," and three out of 10 (34 percent) said it occurred at least "occasionally." Approximately one out of 10 teachers (8 percent) reported that online hate speech occurred in their classrooms "frequently" or "very frequently," and two out of 10 (22 percent) said that it occurred at least "occasionally."

- High school teachers reported sexting as an issue more than teachers at any other grade level. The frequency of teachers' reports of sexting also increased with grade level: Twenty-seven percent of high school teachers reported that sexting occurred in their classrooms at least occasionally, compared to 19 percent of middle school teachers, 5 percent of third- through fifth-grade teachers, and 9 percent of kindergarten through second-grade teachers.

- Digital citizenship competencies were taught most heavily in high school. Approximately eight out of 10 high school teachers taught at least one type of digital citizenship competency. However, high school teachers reported using digital citizenship curricula or resources less often than teachers of other grade levels, suggesting there may be a lack of curricular resources for this group.

- Overall, the findings show that teachers' reports of technology-related concerns increase with grade level, underscoring the need to teach digital citizenship competencies, especially in upper grade levels.

"DIGITAL CITIZENSHIP" WAS DEFINED in the survey as "thinking critically, behaving safely, and participating responsibly in the digital world." Yet little to no research has examined the extent to which teachers are engaging in classroom practices to develop students' digital citizenship competencies. The present study addresses this gap in the literature with a nationally representative survey, while examining the need for digital citizenship competencies.

Teachers were asked what type of digital citizenship curriculum they have used (if any). They were also asked whether they taught any of the following six key digital citizenship competencies, as defined by Common Sense[6]:

- **Media balance and well-being.** Being aware of the health impacts of media and promoting balance between media use and other activities.

- **Privacy and safety.** Protecting our online data, understanding how we're tracked online, and being careful of online scams.

- **Digital footprint and identity.** What we share about ourselves online and how that affects our identities and reputations.

- **Relationships and communication.** How we communicate and how we develop relationships using digital media, and avoiding risky sharing like sexting.

- **Digital drama, cyberbullying, and hate speech.** How we treat others online with kindness, respect, and dignity.

- **News and media literacy.** How we evaluate online information and credibility, and being a critical media consumer and creator.

Approximately six out of 10 teachers said that they used a digital citizenship curriculum or resource in their classrooms. Additionally, approximately seven out of 10 teachers taught lessons and/or facilitated activities to develop students' digital citizenship competencies in at least one of the areas defined in this study, while the remaining three out of 10 teachers did not teach any of the defined digital citizenship competencies (Figure 2).

Across all grade levels, teaching digital citizenship competencies appears to be more common than using digital citizenship curricula or resources, particularly among middle and high school grades (Figure 3). Teachers of K–2 were almost equally likely to use digital citizenship curricula as they were to teach digital citizenship competencies in non-packaged ways.

6. https://www.commonsense.org/education/digital-citizenship/curriculum

**FIGURE 2. Types of digital citizenship competencies taught by U.S. teachers**

Digital drama, cyberbullying, and hate speech
46%

Privacy and safety
43%

Relationships and communication
38%

News and media literacy
38%

Digital footprint and identity
33%

Media balance and well-being
25%
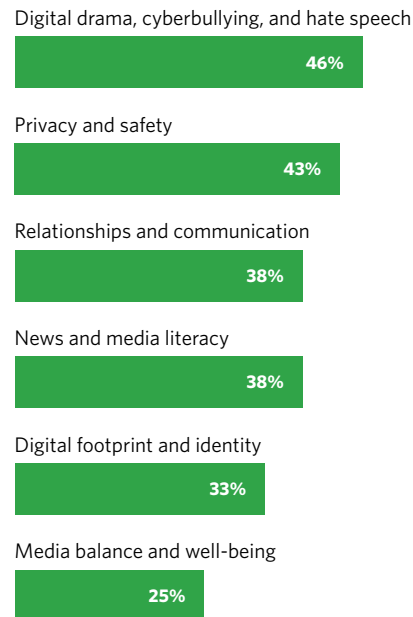
**FIGURE 3. Digital citizenship: curricula used vs. competencies taught in teachers' classrooms**

K–2
62%
60%

3–5
69%
75%

6–8
57%
73%

9–12
48%
76%

All grades
58%
72%

■ Use digital citizenship curricula in classroom
■ Teach digital citizenship competencies in classroom
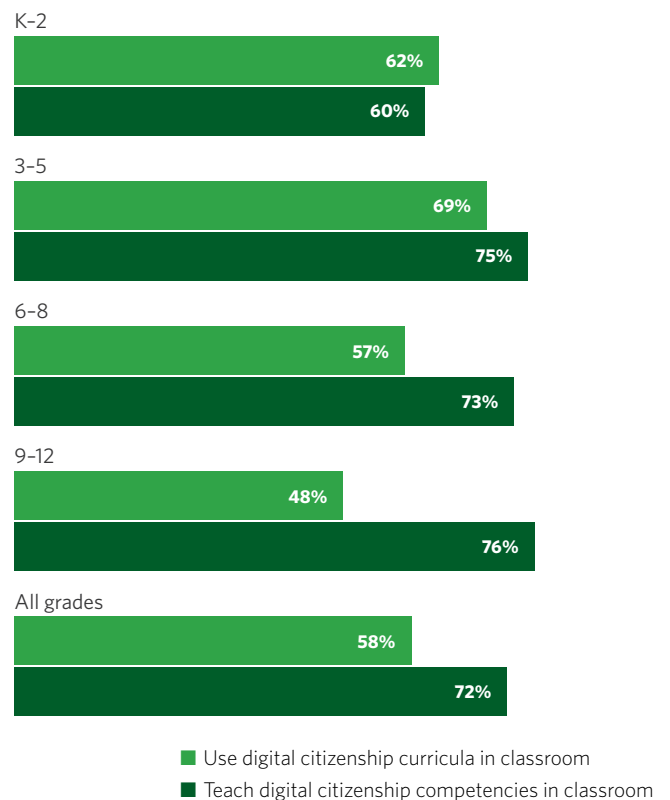
*High school teachers were less likely than teachers of other grade levels to report that they use any type of digital citizenship curricula or resources in their classrooms.* Approximately half of high school teachers (48 percent) reported using any type of digital citizenship curricula or resources compared to 57 percent of sixth- to eighth-grade teachers, 69 percent of third- to fifth-grade teachers, and 62 percent of kindergarten to second-grade teachers (Table 2).

*Teachers of grades K–2 were less likely than teachers of other grade levels to report teaching any of the digital citizenship competencies defined in this study.* Sixty percent of K–2 teachers taught digital citizenship competencies as defined in this study vs. 75 percent of grade 3–5 teachers, 73 percent of grade 6–8 teachers, and 76 percent of grade 9–12 teachers.

Most secondary teachers (76 percent) taught at least one type of digital citizenship competency in their classrooms, and approximately half used digital citizenship curricula. In contrast, approximately six out of 10 K–2 teachers taught at least one type of digital competency, and the same number used some type of digital citizenship curriculum or resource. This finding suggests that digital citizenship curricula or resources may be less available, familiar, and/or relevant to secondary grade teachers than to K–2 teachers. While most high school teachers seemed

interested in teaching digital citizenship competencies, they may lack access to, or awareness of, age-appropriate digital citizenship curricula targeted to their specific subject areas.

Among the teachers who taught digital citizenship competencies, teachers taught 2.2 digital citizenship competencies on average, and the most commonly taught areas were digital drama, cyberbullying, and hate speech (taught by 46 percent of teachers), followed by privacy and safety (taught by 43 percent of teachers) (Figure 2). Teachers of grades 3–5 reported teaching each of these popular topics more often than teachers of other grade levels; digital drama, cyberbullying, hate speech, and/or privacy and safety were taught by half of teachers of grades 3–5 (54 percent), compared to approximately 40 percent of teachers of other grade levels (37 percent of K–2 teachers; 45 percent of grade 6–8 teachers; and 43 percent of high school teachers).

Approximately 10 percent of teachers taught all six areas of digital citizenship competencies. Among teachers who taught all six competencies, most were teachers of grades 3–12 (16 percent K–2, 29 percent grades 3–5, 24 percent grades 6–8, and 32 percent grades 9–12). Approximately four out of 10 teachers (42 percent) taught three or more digital citizenship competencies. Among teachers who taught three or more competencies, the data indicated again that digital citizenship competencies were

**TABLE 2. Teachers who use digital citizenship curricula or teach digital citizenship competencies**

| Percent of teachers who … | | Use digital citizenship curricula or resources in the classroom | Teach digital citizenship competencies |
|---|---|---|---|
| **Total** | | **58%** | **72%** |
| **Grade level** | • K–2 | 62% | 60% |
| | • 3–5 | 69% | 75% |
| | • 6–8 | 57% | 73% |
| | • 9–12 | 48% | 76% |
| **Regional setting** | • Rural | 53% | 67% |
| | • Urban | 59% | 76% |
| | • Suburban | 60% | 72% |
| **Racial/ethnic diversity** | • 75%+ white students | 50% | 67% |
| | • 75%+ students of color | 59% | 72% |
| | • Diverse (26%–74% white) | 63% | 75% |
| **Title 1 status** | • Title 1 | 62% | 74% |
| | • Not Title 1 | 52% | 69% |

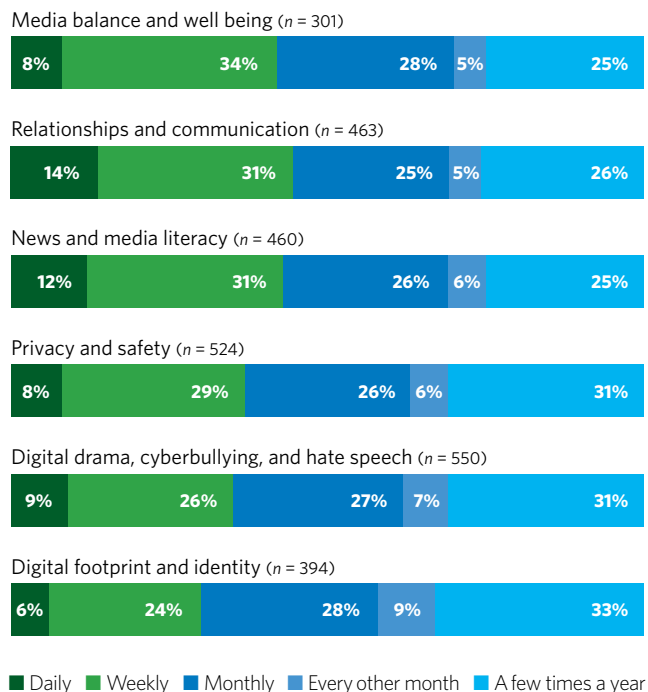Note: See page 5 for further definition of demographic groups.

taught most heavily in grades 3–12, especially in high school: Sixteen percent taught K–2, 27 percent taught grades 3–5, 24 percent taught grades 6–8, and 33 percent taught grades 9–12.

Among those teachers who taught any type of digital citizenship competency, nearly six out of 10 did so monthly or more often. Although relationships and communication and news and media literacy were the third and fourth most popular, taught by four out of 10 teachers (38 percent) who taught digital citizenship competencies, these areas were taught more frequently among those who taught them (Figure 4), suggesting these may be rich topics to which students respond. Among teachers who taught relationships and communication and/or news and media literacy, seven out of 10 (69 percent) did so monthly or more often, whereas among teachers who taught privacy and safety and/or digital drama, cyberbullying, and hate speech, the two most popular digital citizenship competencies, six out of 10 did so at least monthly (63 percent and 62 percent, respectively). Similarly, although only a quarter of teachers taught media balance and well-being, 70 percent of those did so at least monthly.

## Digital Citizenship Curricula Usage and Perceptions of Effectiveness

Approximately six out of 10 U.S. teachers (58 percent) used some type of digital citizenship curriculum or resource in their classrooms. Among teachers who used any type of digital citizenship curriculum in their classrooms, approximately half (52 percent) said it was "extremely" or "very" effective in helping students make smart, safe, or ethical decisions online, whereas only 10 percent said it was "slightly" or "not at all" effective (Figure 5).

**FIGURE 4. Frequency with which U.S. K–12 teachers teach digital citizenship competencies**

Media balance and well being (*n* = 301)

| 8% | 34% | 28% | 5% | 25% |

Relationships and communication (*n* = 463)

| 14% | 31% | 25% | 5% | 26% |

News and media literacy (*n* = 460)

| 12% | 31% | 26% | 6% | 25% |

Privacy and safety (*n* = 524)

| 8% | 29% | 26% | 6% | 31% |

Digital drama, cyberbullying, and hate speech (*n* = 550)

| 9% | 26% | 27% | 7% | 31% |

Digital footprint and identity (*n* = 394)

| 6% | 24% | 28% | 9% | 33% |

■ Daily  ■ Weekly  ■ Monthly  ■ Every other month  ■ A few times a year

Note: Segments may not total 100% due to rounding.

**FIGURE 5. Teachers' reports of the level of effectiveness of the digital citizenship curricula they use**

- **1%** Not at all
- Slightly 9%
- Extremely 14%
- Very 38%
- Moderately 39%
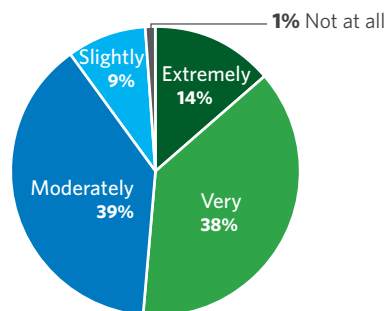
## Teachers' Observations of Technology-Related Issues and Concerns

Teachers were asked how often they observed various technology-related issues in their own classrooms (Figure 6). Teachers' top concern was that "students lack skills to critically evaluate online information," which 35 percent observed "frequently" or "very frequently." Correlating with grade-level expectations, middle and high school teachers reported this issue more frequently than K–2 teachers (38 percent and 42 percent of middle and high school teachers, compared to 25 percent of K–2 teachers).
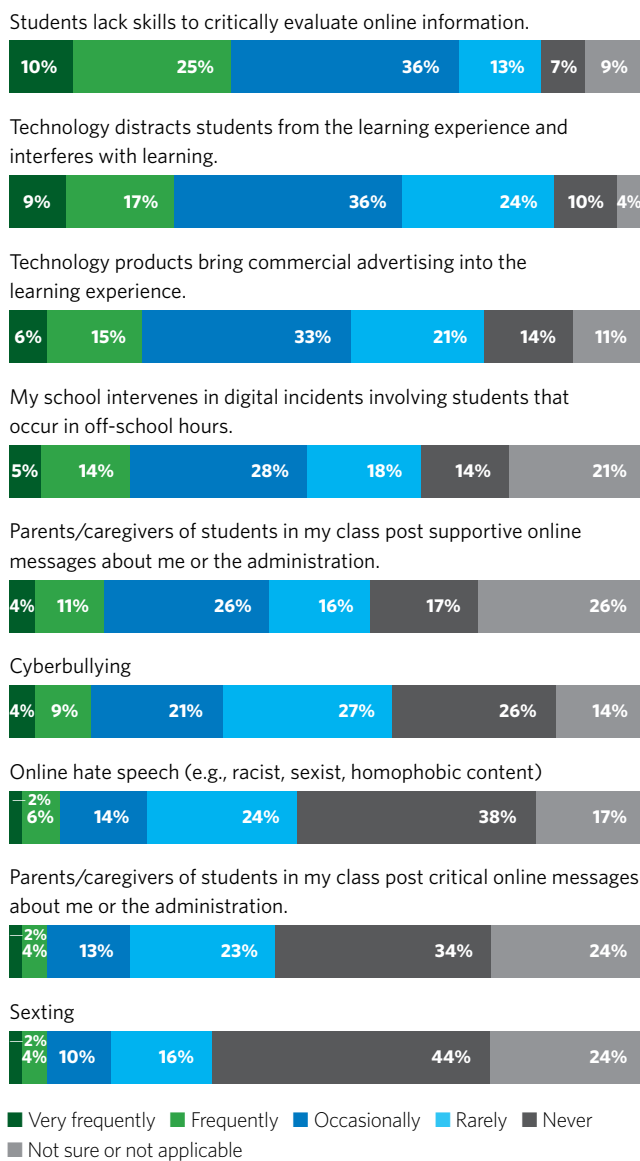
The second most frequently observed issue was that "technology distracts students from the learning experience and interferes with learning," reported by 26 percent of teachers as "frequent" or "very frequent" in their classrooms. This issue was also reported more often as grade levels increased. High school teachers observed technology distraction more than teachers of all other grade levels, while grade 6–8 teachers reported it more often than elementary school teachers. Specifically, approximately half of high school teachers (45 percent), a quarter of middle school teachers (28 percent), and one out of 10 grade 3–5 and K–2 teachers (13 percent and 12 percent, respectively) observed that technology "frequently" or "very frequently" distracted and interfered with learning.

The third most common issue was that "technology products bring commercial advertising into the learning experience," reported by 21 percent of teachers as "frequently" or "very frequently" occurring in their classrooms. Teachers' reports about the frequency of this issue did not differ according to school or teacher characteristics.

The fourth most common issue was that "my school intervenes in digital incidents involving students that occurred in off-school hours," reported by 19 percent of teachers. High school and middle school teachers were more likely to report that this issue occurred "frequently" or "very frequently," as compared to elementary school teachers (27 percent and 21 percent of high school and middle school teachers, respectively, versus approximately 13 percent of elementary school teachers).

"Parents or caregivers of students in my class post supportive messages about me or the administration online" was reported by 15 percent of teachers. Though not an "issue" for teachers, it was noteworthy that teachers reported that supportive messages were more commonly posted about them online than critical messages, with less than half as many teachers (7 percent)

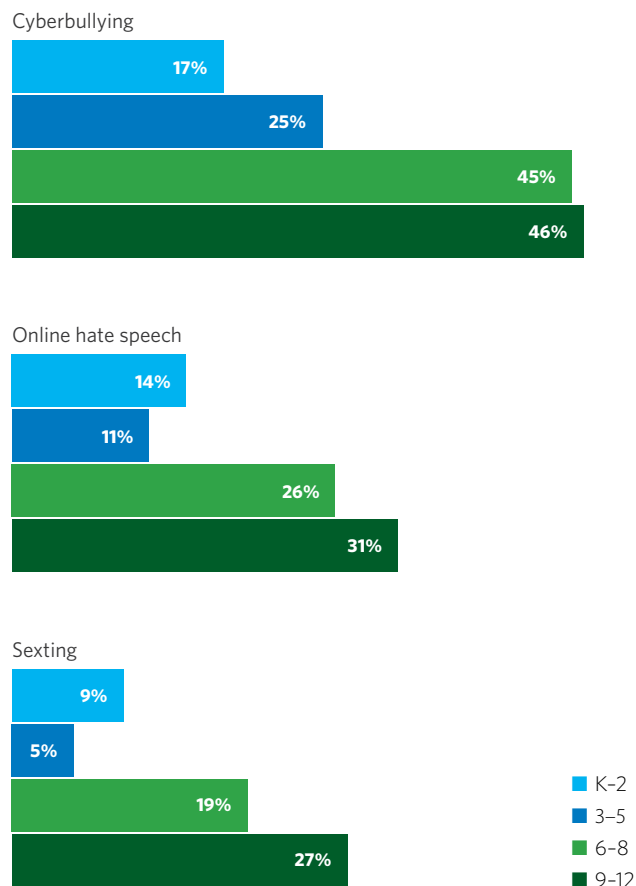**FIGURE 6. U.S. teachers' reports of frequency of technology-related issues and concerns**

Students lack skills to critically evaluate online information.

| Very frequently | Frequently | Occasionally | Rarely | Never | Not sure or not applicable |
|---|---|---|---|---|---|
| 10% | 25% | 36% | 13% | 7% | 9% |

Technology distracts students from the learning experience and interferes with learning.

| 9% | 17% | 36% | 24% | 10% | 4% |

Technology products bring commercial advertising into the learning experience.

| 6% | 15% | 33% | 21% | 14% | 11% |

My school intervenes in digital incidents involving students that occur in off-school hours.

| 5% | 14% | 28% | 18% | 14% | 21% |

Parents/caregivers of students in my class post supportive online messages about me or the administration.

| 4% | 11% | 26% | 16% | 17% | 26% |

Cyberbullying

| 4% | 9% | 21% | 27% | 26% | 14% |

Online hate speech (e.g., racist, sexist, homophobic content)

| 2% | 6% | 14% | 24% | 38% | 17% |

Parents/caregivers of students in my class post critical online messages about me or the administration.

| 2% | 4% | 13% | 23% | 34% | 24% |

Sexting

| 2% | 4% | 10% | 16% | 44% | 24% |

■ Very frequently ■ Frequently ■ Occasionally ■ Rarely ■ Never
■ Not sure or not applicable

Note: Segments do not total 100% due to rounding.

stating that critical messages were posted "frequently" or "very frequently." Teachers of K–2 were more likely than teachers of other grade levels to report parents posting supportive messages as occurring "frequently" or "very frequently" (21 percent of K–2 teachers vs. approximately 12 percent of teachers of other grade levels). Approximately one out of four teachers felt unsure about how often supportive messages were posted about them online, with 26 percent reporting "not sure/not applicable." Suburban teachers reported "not sure/not applicable" more often than rural teachers (29 percent vs. 21 percent). Similarly, approximately a quarter of teachers (24 percent) were unsure how often critical messages were posted online about them (or did not feel the issue applied to them), with no differences according to school or teacher characteristics.

Cyberbullying and online hate speech were observed by many teachers (61 percent and 46 percent, respectively), though cyberbullying was observed more frequently. Approximately one out of 10 teachers (13 percent) said that cyberbullying occurred in their classrooms "frequently" or "very frequently," and three out of 10 (34 percent) said it occurred at least "occasionally." Similarly, approximately one out of 10 teachers reported that online hate speech (8 percent) occurred in their classrooms "frequently" or "very frequently," and two out of 10 (22 percent) said that it occurred at least "occasionally."

*The frequency of both cyberbullying and online hate speech increased with grade level, with middle and high school teachers reporting higher frequencies of cyberbullying and online hate speech than elementary school teachers.* Nearly one out of five upper-grade-level teachers said that cyberbullying occurred "frequently" or "very frequently" in their classrooms (17 percent of grade 6–8 teachers and 18 percent of high school teachers) compared to approximately one out of 10 elementary school teachers who said the same (9 percent of K–2 teachers and 6 percent of grade 3–5 teachers). Furthermore, nearly half of middle and high school teachers said that cyberbullying occurred at least occasionally in their classrooms (45 percent and 46 percent, respectively), compared to approximately one out of five elementary school teachers who said the same (25 percent of grade 3–5 teachers and 17 percent of K–2 teachers) (Figure 7). A possible reason that cyberbullying was slightly lower in grades 3–5 compared to K–2 may be that digital citizenship competencies were more heavily taught in grades 3–5 and teachers of grades 3–5 were more likely to teach about digital drama, cyberbullying, and hate speech than teachers of other grade levels.

**FIGURE 7. U.S. teachers' reports of technology-related safety issues occurring "occasionally," "frequently," or "very frequently," by grade level**



Cyberbullying

- K–2: 17%
- 3–5: 25%
- 6–8: 45%
- 9–12: 46%

Online hate speech

- K–2: 14%
- 3–5: 11%
- 6–8: 26%
- 9–12: 31%

Sexting

- K–2: 9%
- 3–5: 5%
- 6–8: 19%
- 9–12: 27%

Legend:
- K–2
- 3–5
- 6–8
- 9–12

Regarding online hate speech, approximately three out of 10 middle or high school teachers, compared to approximately one out of 10 elementary school teachers, said it happened at least occasionally in their classrooms (31 percent of high school teachers, 26 percent of middle school teachers, 11 percent of grade 3–5 teachers, and 14 percent of K–2 teachers).

When asked how often sexting occured in their classrooms, approximately one quarter of teachers responded "not sure/not applicable" (24 percent). Six percent of teachers said that sexting occurred in their classrooms "frequently" or "very frequently," and 16 percent said it occurred at least "occasionally." The frequency of teachers' reports of sexting increased with grade level, with high school teachers reporting the issue more often than teachers of other grade levels and middle school teachers reporting it more often than elementary school teaches (27 percent of high school teachers reported that sexting occurred in their classrooms at least occasionally, compared to 19 percent of middle school teachers, 5 percent of third- to fifth-grade teachers, and 9 percent of kindergarten to second-grade teachers). It is rather surprising and alarming that the incidence of K–2 teachers observing sexting was even 9 percent; among the 25 K–2 teachers who responded "very frequently," "frequently," and "occasionally," responses were split evenly across response categories.

Although cyberbullying, online hate speech, and "sexting" were the least commonly reported issues, the rates at which teachers observed these issues in their classrooms warrant reflection. The frequency of both cyberbullying and online hate speech increased with grade level, with middle and high school teachers reporting higher frequencies of cyberbullying and online hate speech than primary school teachers.

## Additional Disaggregated Findings

*Years of teaching experience.* Teachers with 20 years or less of teaching experience were more likely than teachers with 21 or more years of teaching experience to teach digital citizenship competencies (63 percent of teachers with 21 or more years of experience taught digital citizenship competencies vs. approximately 74 percent of teachers with one to 20 years of experience). Teachers with six to 20 years of teaching experience also were more likely than teachers with 21 or more years of experience to use digital citizenship curricula or resources (51 percent of teachers with 21 or more years of teaching experience used digital citizenship curricula or resources, compared to 61 percent of teachers with six to 20 years of teaching experience). While more teachers with one to five years of experience used digital citizenship curricula or resources (57 percent) than teachers with 21 or more years of teaching experience (51 percent), this difference was not significant.

*School racial/ethnic diversity.* Teachers in schools with more diverse student populations (in which students of color comprised more than 26 percent of the student population and white students comprised less than 74 percent) were more likely to use digital citizenship curricula or resources than teachers in schools with predominantly white student populations (75 percent or more white students). In schools with predominantly white student populations, half of teachers used digital citizenship curricula or resources, compared to approximately 61 percent of teachers in schools with more diverse student populations. Similarly, teachers in schools with more diverse student populations were more likely to teach digital citizenship competencies, as compared to teachers in schools with predominantly white student populations. Approximately two-thirds of teachers in schools with predominantly white student populations taught any of the digital citizenship competencies listed on the survey, whereas approximately 75 percent of teachers in schools with more diverse student populations (comprising approximately 26 percent to 74 percent students of color) did the same. Although teachers in schools with 75 percent or more students of color were more likely to teach digital citizenship competencies than teachers in schools with predominantly white students, the difference was not significant (72 percent of teachers in schools with 75 percent or more students of color vs. 67 percent of teachers in schools with 75 percent or more white students). The findings suggest that teachers in racially and ethnically diverse school settings may be more aware of the importance of digital citizenship in the context of advancing students' responsible and critical usage of digital technology.

*School Title I status.* Teachers in Title I schools were more likely to use digital citizenship curricula or resources than teachers in more affluent schools (62 percent of teachers in Title I schools vs. 52 percent of teachers in non-Title I schools). However, there were no differences in the frequency of teaching digital citizenship competencies according to Title I status. Although teachers in Title I schools were more likely to report teaching digital citizenship competencies than teachers in more affluent schools, the difference was not significant (74 percent of teachers in Title I schools vs. 69 percent of teachers in non-Title I schools).

Teachers in more affluent schools that did not have Title I status also reported "technology distracts students from the learning experience and interferes with learning" more often than those in Title I schools (29 percent vs. 24 percent, respectively).

*Subject areas.* Foreign language, physical education, and fine arts teachers reported more often than math or science teachers that cyberbullying occurred at least occasionally in their classrooms (40 percent of foreign language teachers, 37 percent of PE teachers, and 34 percent of fine arts teachers vs. 27 percent of math or science teachers). Similarly, these same teachers also reported more often that online hate speech occurred at least occasionally in their classrooms as compared to math or science teachers (30 percent of foreign language teachers, 26 percent of PE teachers, and 25 percent of fine arts teachers vs. 17 percent of math or science teachers). Finally, foreign language, PE, and fine arts teachers were more likely to report that technology distracted from learning (28 percent, 38 percent, and 29 percent of foreign language, PE, and fine arts teachers, respectively), as compared to math and science teachers who reported the same (20 percent and 21 percent, respectively).

# TEACHERS' USAGE OF DIGITAL TOOLS AND PERCEPTIONS OF THEIR EFFECTIVENESS FOR STUDENT LEARNING

THE IMPACT OF EDUCATIONAL technology on learning often depends on the context in which and purpose for which the technology is used. Teachers' own beliefs about the relevance of technology to learning also influence the impact of educational technology. In this chapter, teachers' usage and perceptions of the effectiveness of various types of educational technology tools are discussed, while considering the context of teaching and learning, including grade levels and subject areas. This chapter also explores teachers' attitudes toward assistive technology.

To assess teachers' usage of and perceptions of a broad variety of educational technology tools, a list of 12 types of educational technology tools was developed and presented in the survey using a randomized order:

- Learning management systems
  (e.g., Google Classroom, Canvas, Moodle)

- Video-streaming services
  (e.g., YouTube, SchoolTube, Netflix)

- Social media
  (e.g., Twitter, Facebook)

- Core curricular programs
  (e.g., Read 180, Achieve 3000, Edmentum)

- Supplemental apps or websites
  (e.g., Khan Academy, IXL, Kahoot!)

- Productivity and presentation tools
  (e.g., Google G Suite for Education [including Google Docs, Slides, Sheets], Microsoft Office 365 [including Microsoft Word, Excel, PowerPoint], Nearpod)

- Digital creation tools
  (e.g., iMovie, Photoshop, Scratch)

- Digital games
  (e.g., *Minecraft*, *BrainPop*, *DreamBox*)

- Assistive technology
  (e.g., Texthelp, Bookshare, text-to-speech software)

- Communication and portfolio tools
  (e.g., Remind, ClassDojo, Seesaw)

- Well-being and health tools
  (e.g., GoNoodle, Mind Yeti, Amaze)

- Free resources for educators
  (e.g., PBS, National Geographic, OER)

Teachers were asked about the types of digital tools they used with their students in their classrooms and how frequently they used them. For each type of digital tool they indicated using, teachers were asked how effective they found the digital tool for increasing three types of student learning outcomes[7]:

- Students' engagement in learning

- Students' skills in communication, collaboration, critical thinking, and/or creativity

- Students' knowledge and/or skills in a specific subject area

If a teacher indicated the digital tool was "moderately," "very," or "extremely" effective for developing content knowledge and/or skills in a specific subject area, they were asked in which subject area it was effective and provided with subject area choices in which they had indicated they taught.

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7. The survey asked, "Based on your experiences with technology products in *your classroom*, how effective is/are the type(s) of technology product(s) listed below, for … ?" on a five-point, unipolar scale.

## HIGHLIGHTS

- Most K–12 teachers use a variety of digital tool types (4.6 on average) with students in their classrooms. Only 5 percent of K–12 teachers used no digital tools, and 75 percent used three or more types of digital tools with students in their classrooms. Teachers used more digital tools, on average, in grades 3–5 and 6–8.

- Video-streaming services (e.g., YouTube, SchoolTube, Netflix) were the most commonly used type of digital tool, used by approximately 60 percent of K–12 teachers with students in their classrooms. Productivity and presentation tools (e.g., Google G Suite for Education, Microsoft Office) constituted the second-most-common type of digital tool, used by approximately half of teachers with their students. The least used digital tools were tools for well-being and health (25 percent), digital creation tools (25 percent), and social media (13 percent). Video-streaming services, productivity and presentation tools, and/or learning management systems were the most frequently used type of tool, with approximately three out of 10 K–12 teachers using them at least two to three times per week.

- Most digital tool types, with the exception of social media, were rated as effective for engaging students in learning.

- Productivity and presentation tools (e.g., Google G Suite for Education, Microsoft Office), digital creation tools (e.g., iMovie, Photoshop, Scratch), and learning management systems (e.g., Google Classroom, Canvas, Moodle) were rated by teachers as the most effective digital tools for developing students' 21st-century skills in communication, collaboration, critical thinking, and/ or creativity. Though teachers by a wide margin saw digital creation tools as being effective for developing 21st-century skills, they were among the least used tools in the classroom.

- Within subject areas, there are mismatches between the types of technology products teachers use most frequently and the types of technology products they rate most effective for developing content knowledge and skills. For example, ELA teachers rated productivity and presentation tools and assistive technology as the most effective types of digital tools for developing ELA content knowledge and skills, but they often used other digital tools that they rated as less effective with greater frequency. Similarly, math teachers rated supplemental apps or websites as the most effective digital tools for developing students' content knowledge and skills in math, but they used them less often than many other digital tools they rated as less effective.

- Teachers generally report positive experiences with assistive technology (AT), although almost a quarter of teachers (24 percent) believe that AT gives students an unfair advantage over other students, while slightly more than half of teachers (55 percent) disagree.

- Forty-five percent of teachers identify "access to equipment" as a barrier to using AT more often, while 31 percent identify "lack of training/knowledge of what is available." Teachers in Title I schools are more likely to identify insufficient access to equipment as a barrier.

## Teachers' Usage of Digital Tools

Only a small minority of teachers (5 percent) reported that they did not use any type of digital tools with their students. On average, teachers reported using 4.6 types of digital tools with students in their classrooms, with half of teachers using more than four types. The frequency with which teachers used digital tools in the classroom varied by the type of digital tool that was used. Discussed below are the most commonly used digital tools and the digital tools that were used most frequently in the classroom (or the "stickiest" digital tools).

*Most common digital tools.* As shown in Figure 8, video-streaming services (e.g., YouTube, SchoolTube, Netflix) constituted the most popular type of digital product among teachers, used by approximately six out of 10 teachers with students in their classrooms (58 percent). Productivity and presentation tools (e.g., Google G Suite for Education, Microsoft Office) constituted the second most popular category, used by slightly more than half of teachers with students in their classrooms (54 percent).

Four types of digital products were similarly popular, with each type used by roughly half of teachers:
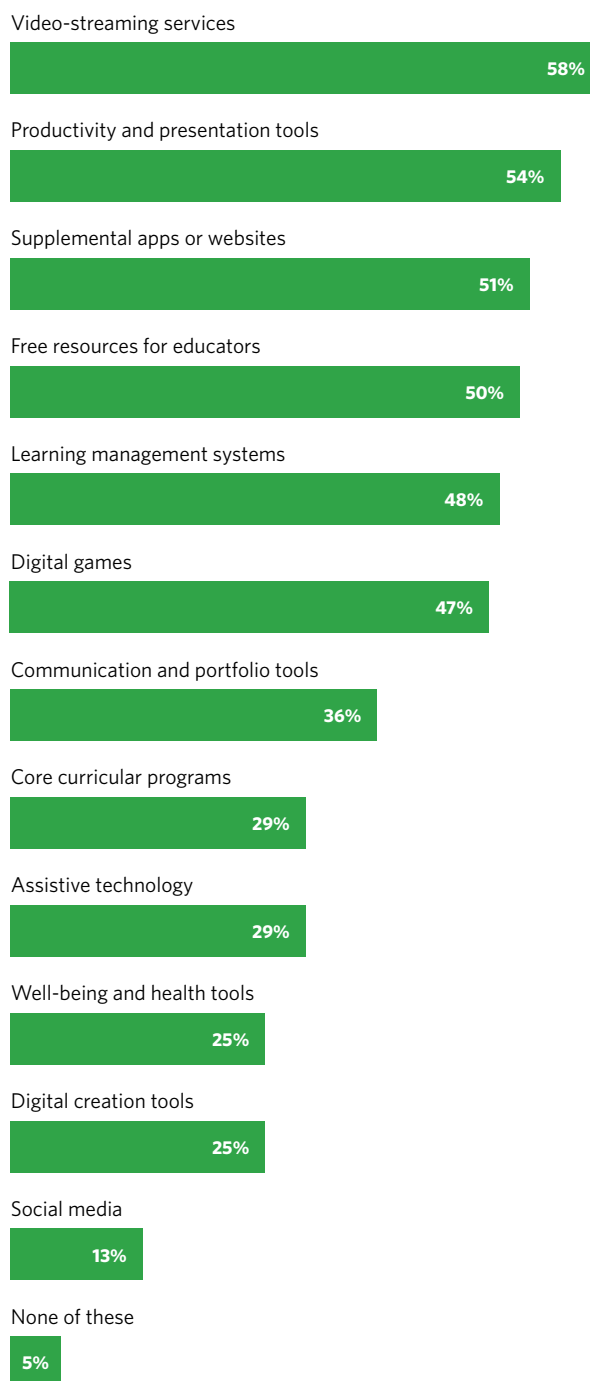
- Supplemental apps or websites (51 percent)
  (e.g., Khan Academy, IXL)

- Free resources for educators (50 percent)
  (e.g., PBS, National Geographic, OER)

- Learning management systems (48 percent)
  (e.g., Google Classroom, Canvas, Moodle)

- Digital games (47 percent)
  (e.g., *Minecraft*, *BrainPop*)

Less common types of digital products, used by approximately a third of teachers, included:

- Communication and portfolio tools (36 percent)
  (e.g., Remind, Class Dojo, Seesaw)

- Core curricular programs (29 percent)
  (e.g., Read 180, Achieve 3000, Edmentum)

- Assistive technology (29 percent)
  (e.g., Texthelp, Bookshare, text-to-speech software)

A quarter of teachers used digital tools for well-being and health, and a quarter used digital creation tools. Only one in 10 teachers used social media with students in their classrooms.

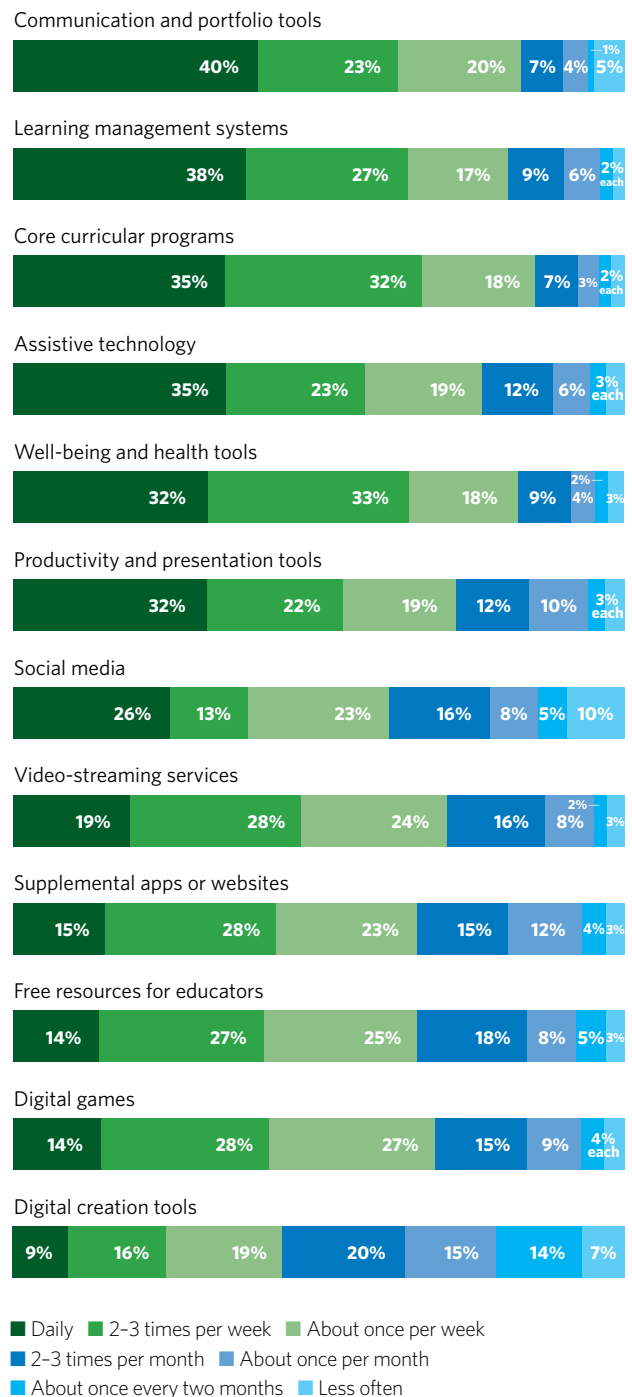**FIGURE 8. Types of digital tools teachers use in their classrooms**

| Type | Percent |
|---|---|
| Video-streaming services | 58% |
| Productivity and presentation tools | 54% |
| Supplemental apps or websites | 51% |
| Free resources for educators | 50% |
| Learning management systems | 48% |
| Digital games | 47% |
| Communication and portfolio tools | 36% |
| Core curricular programs | 29% |
| Assistive technology | 29% |
| Well-being and health tools | 25% |
| Digital creation tools | 25% |
| Social media | 13% |
| None of these | 5% |

*Most popular and "stickiest" digital tools.* If a teacher reported using a digital tool, the survey also asked them to report the frequency with which they used the digital tool (summarized in Figure 9). Overall, learning management systems were used with the greatest frequency by the largest number of teachers. Approximately half of all K–12 teachers used learning management systems (48 percent), and among those teachers who used learning management systems approximately two-thirds (65 percent) did so at least two to three times per week. Thus, approximately, three out of 10 K–12 teachers in the U.S. (31 percent) used learning management systems at least two to three times per week.

By comparison, although more teachers (58 percent) used video-streaming services in the classroom, they generally used video-streaming services less frequently. Among the teachers who used video-streaming services, slightly less than half (47 percent) did so at least two to three times a week; thus, slightly fewer than three out of 10 K–12 teachers in the U.S. (27 percent) used video-streaming services at least two to three times a week. Similarly, while slightly more than half of teachers used productivity and presentation tools (54 percent), slightly more than half (54 percent) used them at least two to three times a week in their classrooms. Thus, approximately three out of 10 K–12 teachers in the U.S. (29 percent) used productivity and presentation tools at least two to three times a week in their classrooms.

Communication and portfolio tools also were intensively used among teachers who chose to use them (36 percent of K–12 teachers); approximately 63 percent did so at least two to three times per week. Thus, nearly a quarter of U.S. K–12 teachers used communication and portfolio tools at least two to three times per week (23 percent).

Core curricular programs and assistive technology also were used intensively by the approximately three out of 10 U.S. K–12 teachers who chose to incorporate them into their classrooms (29 percent). Among the teachers who used either core curricular programs or assistive technology, approximately two-thirds (67 percent) did so at least two to three times per week. Thus, approximately two out of 10 U.S. K–12 teachers used core curricular programs and/or assistive technology in their classrooms at least two to three times a week (19 percent and 17 percent, respectively). Tools for well-being and health also were used intensively by few teachers. While only a quarter of teachers used tools for well-being and health, approximately two-thirds (65 percent) did so at least two to three times per week.

**FIGURE 9. Frequency of teachers' usage of classroom technology, by type**



Communication and portfolio tools
| Daily | 2–3 times per week | About once per week | 2–3 times per month | About once per month | About once every two months | Less often |
|---|---|---|---|---|---|---|
| 40% | 23% | 20% | 7% | 4% | — 1% | 5% |

Learning management systems
| 38% | 27% | 17% | 9% | 6% | 2% each | |

Core curricular programs
| 35% | 32% | 18% | 7% | 3% | 2% each | |

Assistive technology
| 35% | 23% | 19% | 12% | 6% | 3% each | |

Well-being and health tools
| 32% | 33% | 18% | 9% | 2%— | 4% | 3% |

Productivity and presentation tools
| 32% | 22% | 19% | 12% | 10% | 3% each | |

Social media
| 26% | 13% | 23% | 16% | 8% | 5% | 10% |

Video-streaming services
| 19% | 28% | 24% | 16% | 8% | 2%— | 3% |

Supplemental apps or websites
| 15% | 28% | 23% | 15% | 12% | 4% | 3% |

Free resources for educators
| 14% | 27% | 25% | 18% | 8% | 5% | 3% |

Digital games
| 14% | 28% | 27% | 15% | 9% | 4% each | |

Digital creation tools
| 9% | 16% | 19% | 20% | 15% | 14% | 7% |

Legend:
■ Daily ■ 2–3 times per week ■ About once per week
■ 2–3 times per month ■ About once per month
■ About once every two months ■ Less often

Note: Segments may not total 100% due to rounding.

Overall, these findings suggest that certain digital tools—namely, learning management systems, communication and portfolio tools, core curricular programs, assistive technology, and tools for well-being and health—are less commonly used by teachers but the teachers who use these digital tools tend to do so more intensively.

*Teachers' digital tool use by grade band.* Teachers of grades K–2 were more likely than teachers of grades 3–5 to report not using any digital tools with students in their classrooms (8 percent of K–2 teachers vs. 4 percent of grade 3–5 teachers). The average number of digital tools that teachers used in the classroom peaks in grades 3-5, and trends down slightly thereafter (Figure 10). A one-way analysis of variance showed that K–2 teachers used fewer digital tools than teachers of grades 3–5 and 6–8, while teachers of grades 3–5 used more digital tools than teachers of grades 9–12[8]. There were no significant differences in the average number of digital tools used by teachers of grades K–2 vs. of grades 9–12, teachers of grades 3–5 vs. of grades 6–8, or teachers of grades 6–8 vs. of grades 9–12.

**FIGURE 10. Average number of digital tool types used in the classroom, by grade band**
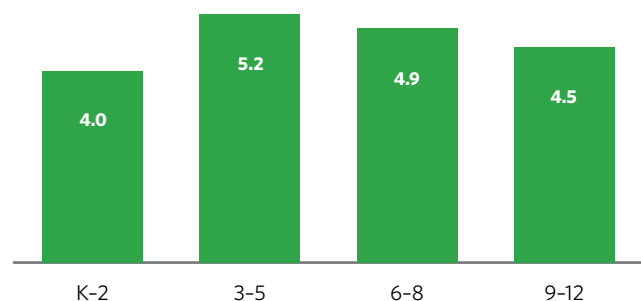


Types of digital tools most commonly used also varied by grade level. Teachers of grades K–2 used several types of digital products less commonly than teachers of the other grade bands:

- Video-streaming services
  (49 percent of K–2 teachers vs. 59 percent of grade 3–5 teachers, 63 percent of grade 6–8 teachers, and 59 percent of grade 9–12 teachers)

- Productivity and presentation tools
  (33 percent of K–2 teachers vs. 51 percent of grade 3–5 teachers, 60 percent of grade 6–8 teachers, and 66 percent of grade 9–12 teachers)

- Supplemental apps or websites
  (41 percent of K–2 teachers vs. 53 percent of grade 3–5 teachers, 58 percent of grade 6–8 teachers, and 51 percent of grade 9–12 teachers)

- Learning management systems
  (28 percent of K–2 teachers vs. 51 percent of grade 3–5 teachers, 53 percent of grade 6–8 teachers, and 55 percent of grade 9–12 teachers)

- Assistive technology
  (18 percent of K–2 teachers vs. 34 percent of grade 3–5 teachers, 37 percent of grade 6–8 teachers, and 27 percent of grade 9–12 teachers)

Teachers in grades 3–5 used two types of digital products more often than teachers of other grade levels:

- **Free resources for educators.** Teachers of grades 3–5 reported using open educational resources (OER) more often than teachers of grades 6–8 and more often than high school teachers (59 percent of grade 3–5 teachers vs. 51 percent of K–2 teachers, 48 percent of grade 6–8 teachers, and 45 percent of grade 9–12 teachers).

- **Digital games.** Teachers of grades 3–5 used digital games more often than teachers of other grade levels, whereas high school teachers used digital games with their students less often than teachers of other grade levels (66 percent of grade 3–5 teachers vs. 51 percent of K–2 teachers, 47 percent of grade 6–8 teachers, and 29 percent of grade 9–12 teachers).

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8.  A one-way ANOVA test showed significant differences in the number of digital tools that teachers used in their classrooms according to the grade-level band they taught: $F(3, 1203) = 9.499$, $p < .001$. A Tukey post hoc test showed significant differences between teachers of grades K–2 and of grades 3–5 ($p < .001$), teachers of grades K–2 and of grades 6–8 ($p < .005$), and teachers of grades 3–5 and of grades 9–12 ($p < .005$). There was no significant difference between teachers of grade K–2 and of grades 9–12, between teachers of grades 3–5 and of grades 6–8, or teachers of grades 6–8 and of grades 9–12.

Teachers' usage of several types of digital tools increased with grade level:

- **Productivity and presentation tools.** Teachers of grades K–2 used these tools with their students less often than teachers of any other grade level, while teachers of grades 3–5 used these less often than teachers of grades 6–12 (33 percent of K–2 teachers vs. 51 percent of grade 3–5 teachers, 60 percent of grade 6–8 teachers, and 66 percent of grade 9–12 teachers).

- **Digital creation tools.** Teachers of grades 6–12 used digital creation tools with their students more often than teachers of K–2, and high school teachers used digital creation tools more often than grade 3–5 teachers (17 percent of K–2 and 22 percent of grade 3–5 teachers vs. 28 percent of grade 6–8 teachers and 30 percent of grade 9–12 teachers).

- **Social media.** High school teachers used social media more often than teachers of other grade levels. Overall, K–5 teachers used social media much less often with their students than teachers of grades 6–12 (8 percent of K–2 and 7 percent of grade 3–5 teachers vs. 14 percent of grade 6–8 teachers and 21 percent of grade 9–12 teachers).

Teachers' usage of tools for well-being and health decreased with grade level. Teachers of grades K–5 used these tools more often with their students than teachers of grades 6–12 (41 percent of K–2 and 40 percent of grade 3–5 teachers vs. 14 percent of grade 6–8 teachers and 10 percent of grade 9–12 teachers).
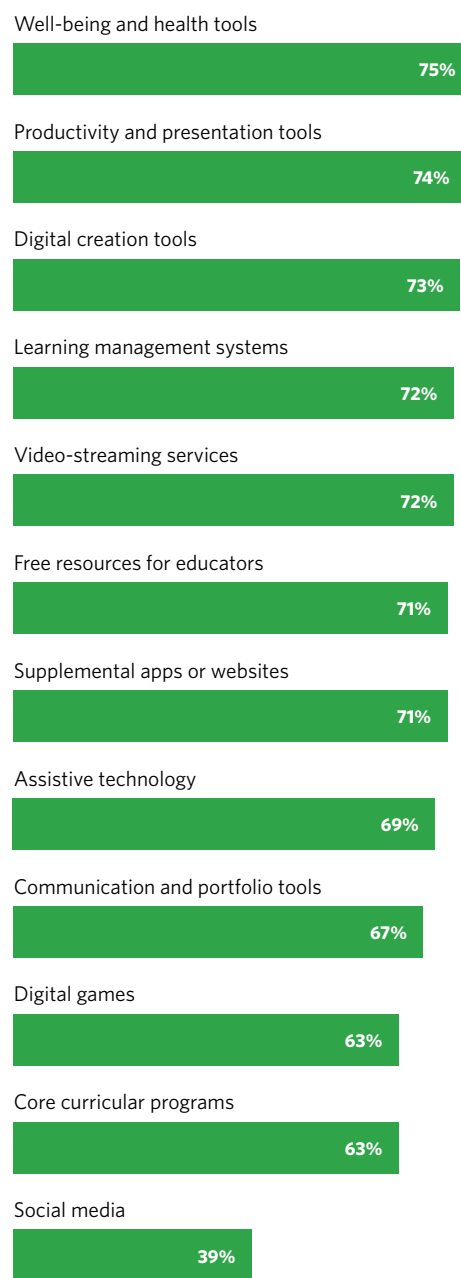
## Teachers' Perceptions of the Effectiveness of Digital Tools

Most digital tools were rated as highly effective for engaging students in learning (Figure 11), consistent with broad views that technology is in and of itself an effective way to engage students. Among the most common and frequently used tools, productivity and presentation tools, learning management systems, and video-streaming services were highly rated for engaging students in learning.

For developing students' 21st-century skills, including communication, collaboration, critical thinking, and/or creativity, teachers rated productivity and presentation tools, digital creation tools, and learning management systems as the top three most effective digital tools (Figure 12, page 22). These results support

teachers' widespread use of productivity and presentation tools and intensive use of learning management systems; however, the potential of digital creation tools to support students' noncognitive skills and engagement seems underutilized.

**FIGURE 11. Teachers who rated various digital tools "extremely" or "very" effective for engaging students in learning**

Well-being and health tools
75%

Productivity and presentation tools
74%

Digital creation tools
73%

Learning management systems
72%

Video-streaming services
72%

Free resources for educators
71%

Supplemental apps or websites
71%

Assistive technology
69%

Communication and portfolio tools
67%

Digital games
63%

Core curricular programs
63%

Social media
39%

For developing students' content knowledge and skills in a specific subject area, seven of the 12 digital product categories were closely rated (Figure 13).
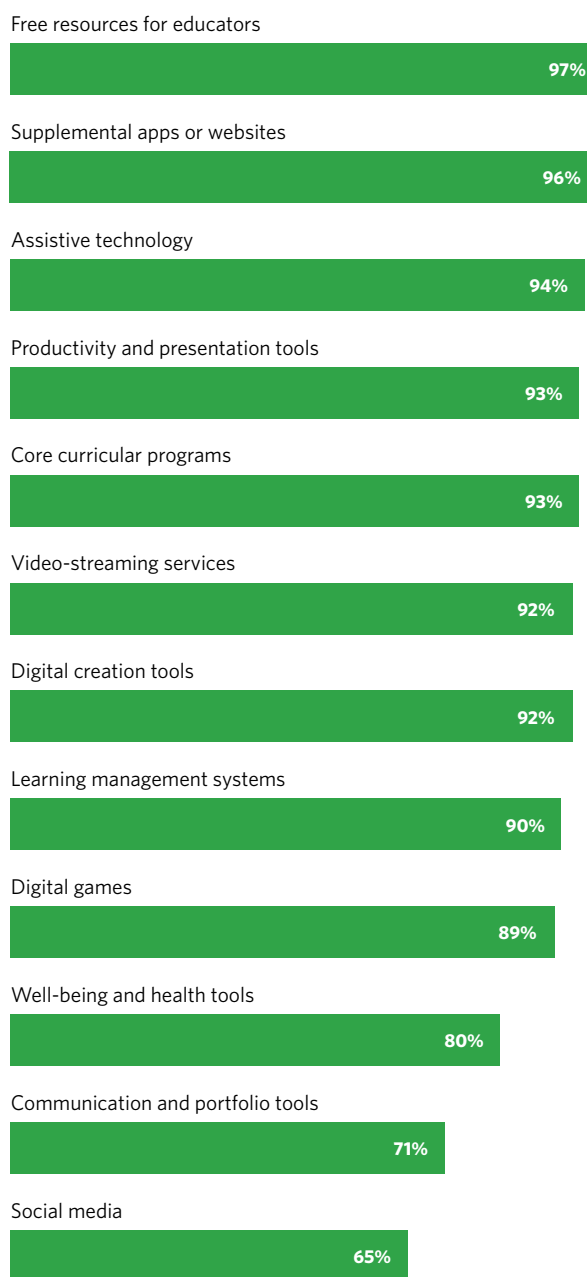
As discussed in the next section, teachers' effectiveness ratings of digital tools for developing students' content knowledge and

skills varied by subject area, providing a more useful picture of how different types of digital tools lend themselves to different subject areas.

**FIGURE 12. Teachers who rated various digital tools "extremely" or "very" effective for developing students' skills in communication, collaboration, critical thinking, and/or creativity**

Productivity and presentation tools
**73%**

Digital creation tools
**70%**

Learning management systems
**64%**

Assistive technology
**59%**

Well-being and health tools
**57%**

Free resources for educators
**56%**

Communication and portfolio tools
**54%**

Core curricular programs
**51%**

Supplemental apps or websites
**51%**

Video-streaming services
**51%**

Digital games
**51%**

Social media
**48%**

**FIGURE 13. Teachers who rated various digital tools "extremely" or "very" effective for developing students' content knowledge or skills in a specific subject area**

Free resources for educators
**97%**

Supplemental apps or websites
**96%**

Assistive technology
**94%**

Productivity and presentation tools
**93%**

Core curricular programs
**93%**

Video-streaming services
**92%**

Digital creation tools
**92%**

Learning management systems
**90%**

Digital games
**89%**

Well-being and health tools
**80%**

Communication and portfolio tools
**71%**

Social media
**65%**

## Subject-Area Gaps Between Effectiveness Perceptions and Usage

For each of five major subject areas (ELA, math, science, social studies, and PE), a gap analysis was performed to examine the consistency between teachers' usage and effectiveness ratings for each type of digital tool.

Productivity and presentation tools and assistive technology were rated as the most effective types of digital tools for developing ELA content knowledge and skills (Figure 14). However, the gap analysis revealed that ELA teachers used productivity and presentation tools and assistive technology less frequently than other digital tools they rated as less effective for developing ELA content knowledge and skills. ELA teachers used free resources for educators, digital games, and tools for health and well-being more, or as frequently, as productivity and presentation tools and assistive technology but rated these tools as much less effective for developing students' content knowledge and skills.

Math teachers rated supplemental apps or websites as the most effective digital tool for developing students' content knowledge and skills in math but used supplemental apps or websites less often than many other digital tools rated as less effective (i.e., core curricular programs and learning management systems) (Figure 15, page 24). Math teachers frequently used several types of digital tools that were rated as relatively less effective (e.g., free resources for educators, tools for health and well-being, and digital creation tools).

Within science and social studies, free resources for educators were rated as the most effective type of digital tool, and educators used this type of digital tool relatively frequently (Figure 16, page 24 and Figure 17, page 25). Trends in science and social studies teachers' usage of digital tools, and their ratings of effectiveness for developing content knowledge and skills, did not reveal any gaps that would suggest that effective tools are being underutilized. Rather, the trends suggest that a number of digital tools (i.e., core curricular programs, tools for health and well-being, supplemental apps or websites, and social media) are being used frequently with relatively little effect on content knowledge and skills.

Physical education teachers rated tools for health and well-being as most effective for developing physical education content knowledge and skills (Figure 18, page 25). Physical education teachers might consider using tools for health and well-being even more frequently for developing content knowledge and skills, as these were rated the most effective and most commonly used type of digital tool within physical education. A number of

digital tools that were used frequently by PE teachers (i.e., supplemental apps or websites, core curricular programs, assistive technology, digital games) were rated relatively ineffective for developing content knowledge and skills in PE.

---

**FIGURE 14. ELA teachers' usage and perceptions of the effectiveness of various digital tools for increasing ELA content knowledge and skills**



Productivity and presentation tools
87%
95%

Assistive technology
89%
94%

Core curricular programs
94%
92%

Learning management systems
89%
90%

Communication and portfolio tools
91%
89%

Social media
77%
80%

Digital creation tools
66%
79%

Video-streaming services
88%
74%

Supplemental apps or websites
85%
74%

Digital games
86%
68%

Free resources for educators
87%
64%

Well-being and health tools
94%
60%

■ Used tool 2–3 times per month
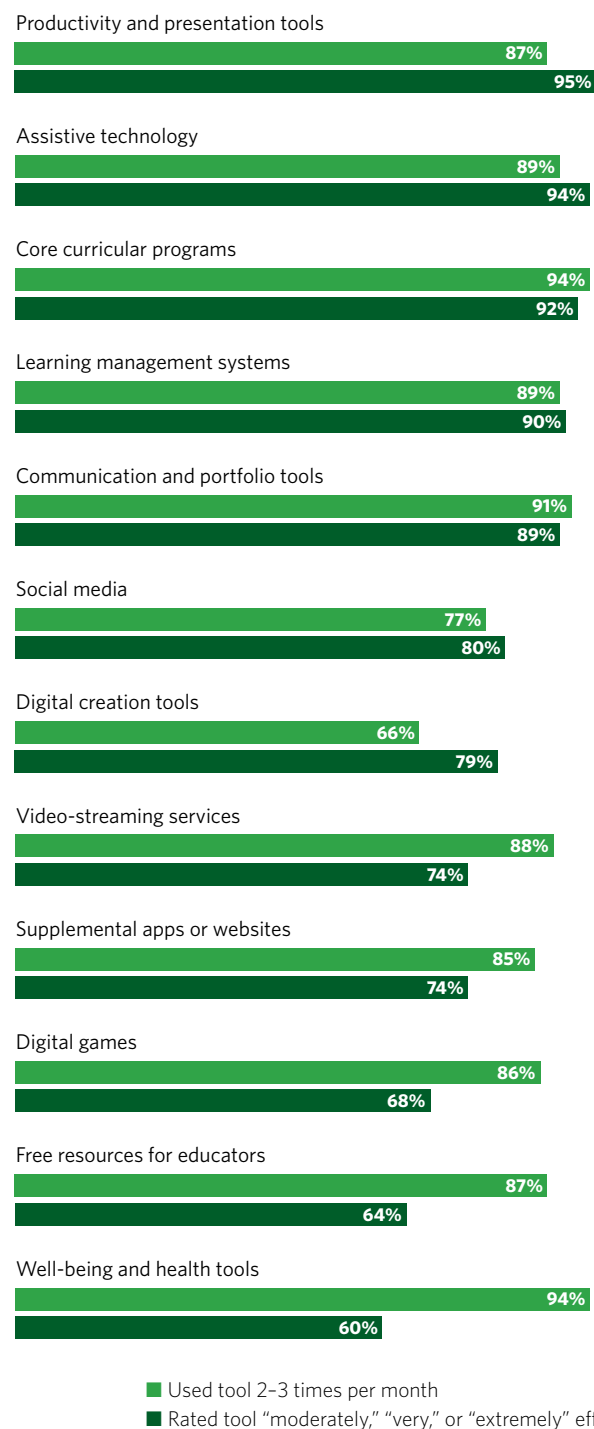■ Rated tool "moderately," "very," or "extremely" effective

**FIGURE 15. Math teachers' usage and perceptions of the effectiveness of various digital tools for increasing math content knowledge and skills**
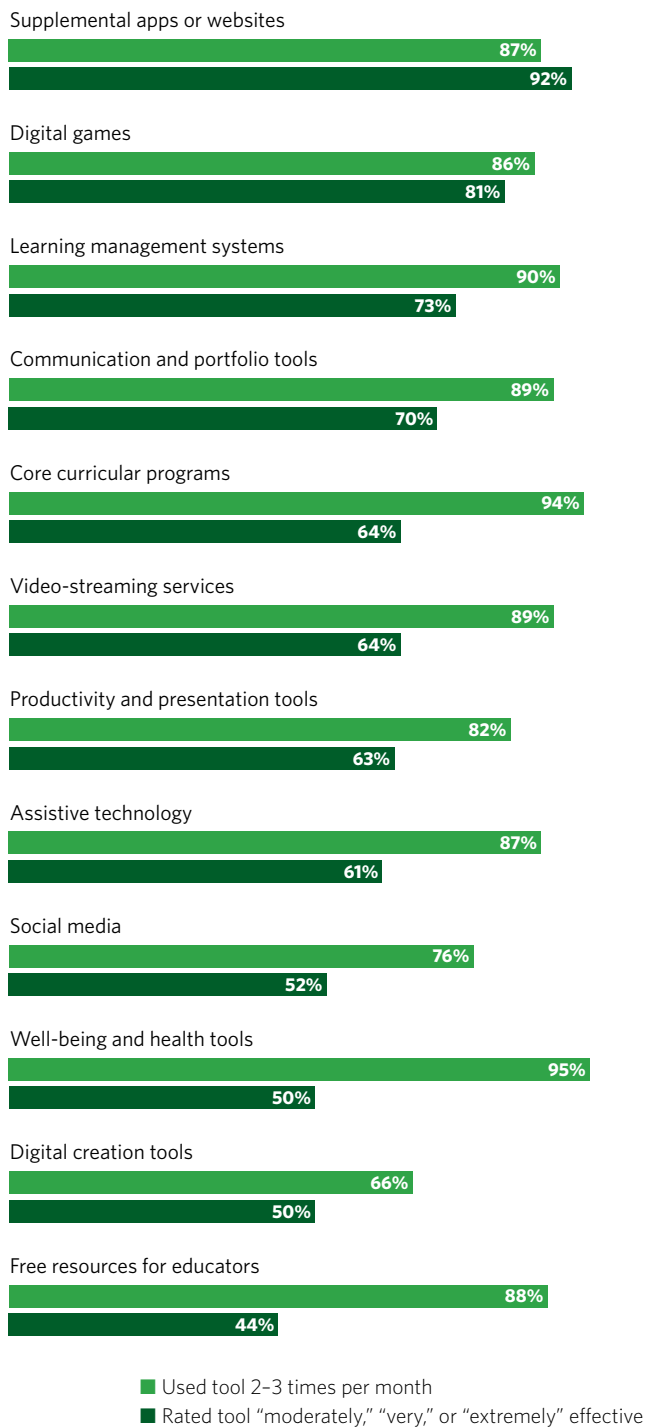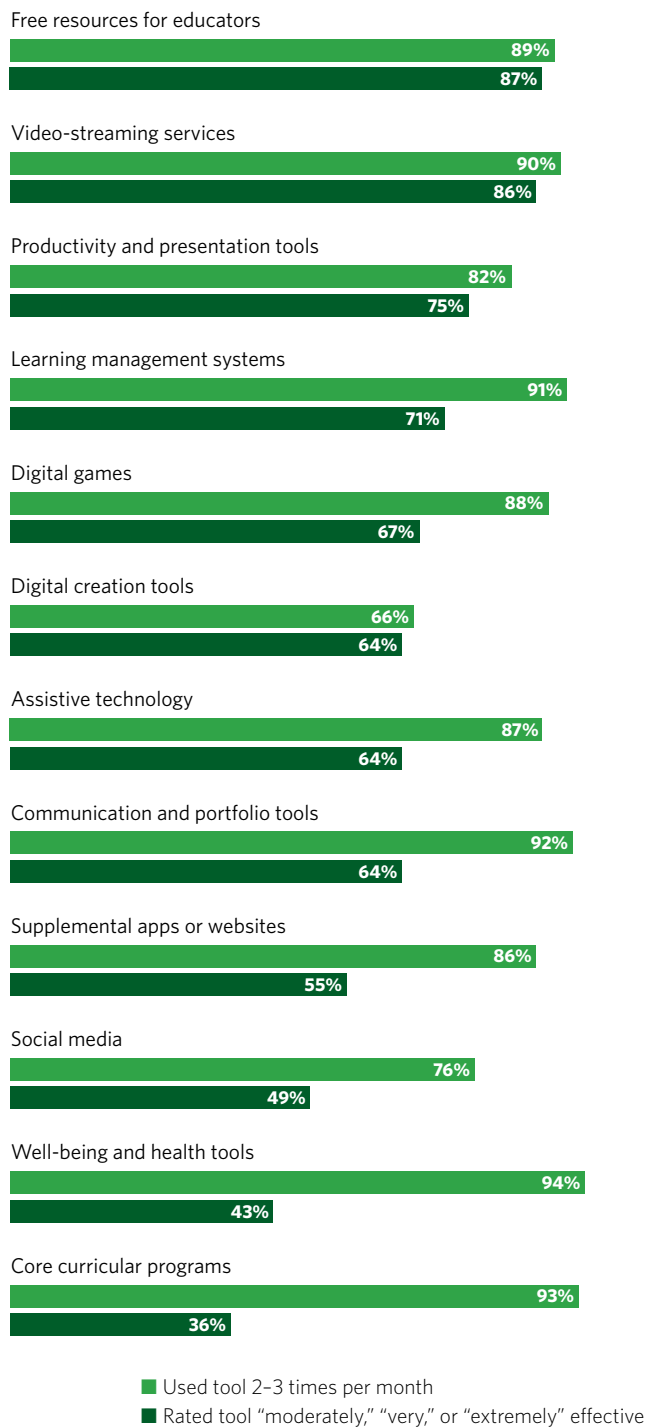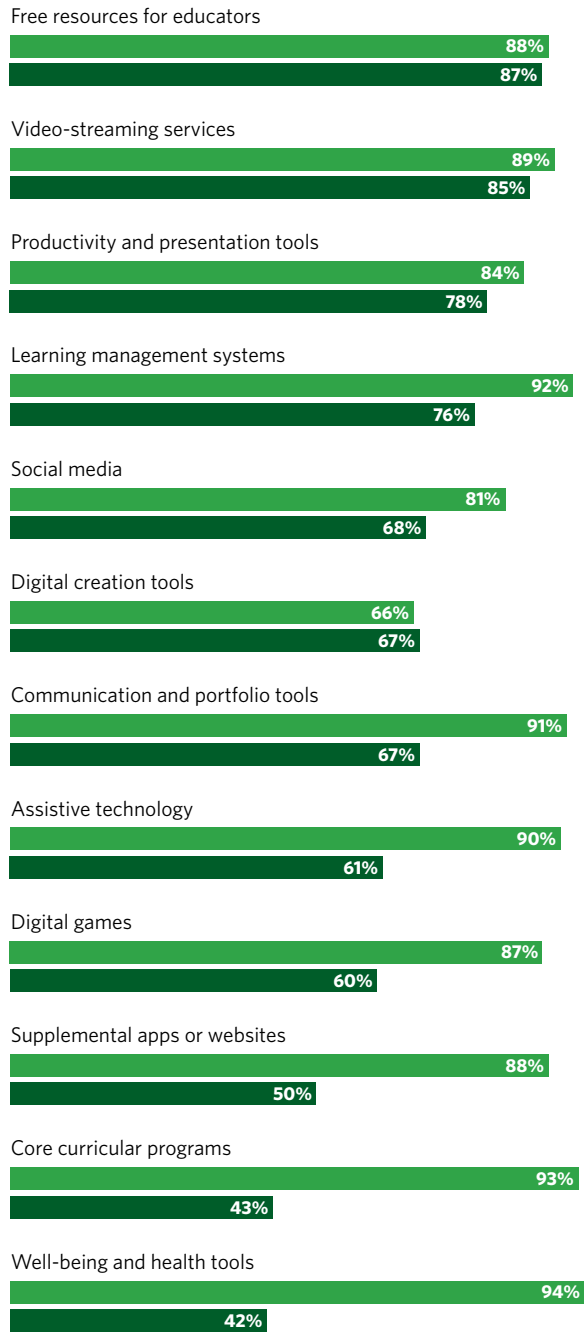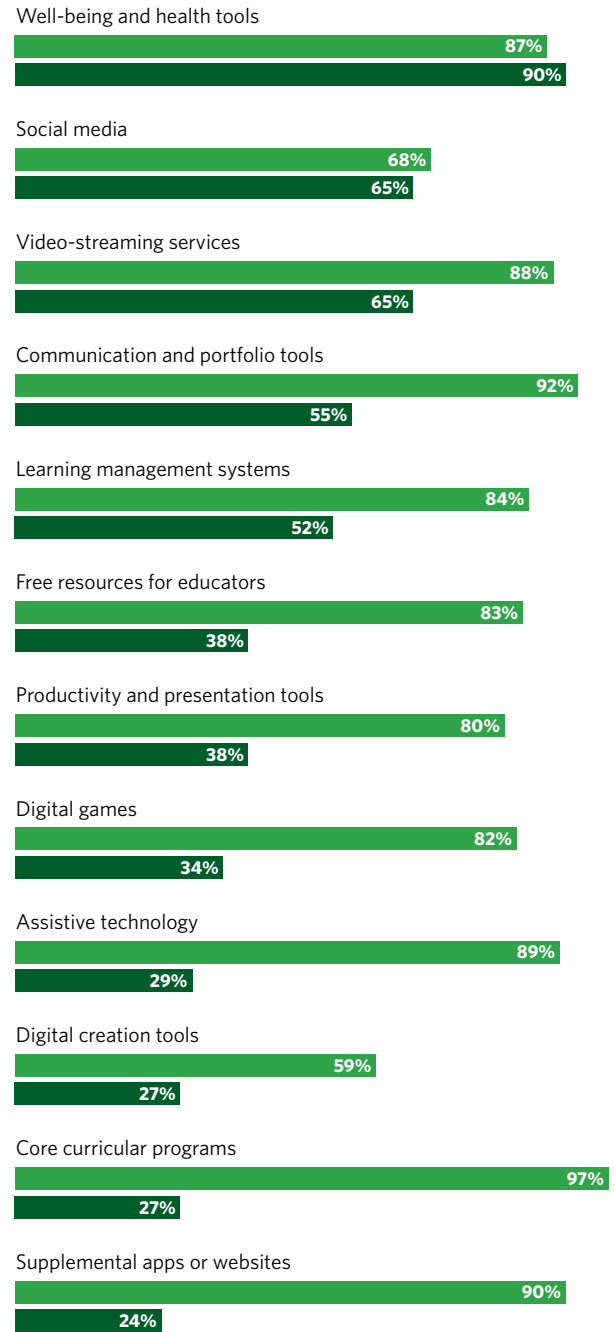
Supplemental apps or websites
- 87%
- 92%

Digital games
- 86%
- 81%

Learning management systems
- 90%
- 73%

Communication and portfolio tools
- 89%
- 70%

Core curricular programs
- 94%
- 64%

Video-streaming services
- 89%
- 64%

Productivity and presentation tools
- 82%
- 63%

Assistive technology
- 87%
- 61%

Social media
- 76%
- 52%

Well-being and health tools
- 95%
- 50%

Digital creation tools
- 66%
- 50%

Free resources for educators
- 88%
- 44%

■ Used tool 2–3 times per month
■ Rated tool "moderately," "very," or "extremely" effective

**FIGURE 16. Science teachers' usage and perceptions of the effectiveness of various digital tools for increasing science content knowledge and skills**

Free resources for educators
- 89%
- 87%

Video-streaming services
- 90%
- 86%

Productivity and presentation tools
- 82%
- 75%

Learning management systems
- 91%
- 71%

Digital games
- 88%
- 67%

Digital creation tools
- 66%
- 64%

Assistive technology
- 87%
- 64%

Communication and portfolio tools
- 92%
- 64%

Supplemental apps or websites
- 86%
- 55%

Social media
- 76%
- 49%

Well-being and health tools
- 94%
- 43%

Core curricular programs
- 93%
- 36%

■ Used tool 2–3 times per month
■ Rated tool "moderately," "very," or "extremely" effective

Free resources for educators
88%
87%

Video-streaming services
89%
85%

Productivity and presentation tools
84%
78%

Learning management systems
92%
76%

Social media
81%
68%

Digital creation tools
66%
67%

Communication and portfolio tools
91%
67%

Assistive technology
90%
61%

Digital games
87%
60%

Supplemental apps or websites
88%
50%

Core curricular programs
93%
43%

Well-being and health tools
94%
42%

- Used tool 2–3 times per month
- Rated tool "moderately," "very," or "extremely" effective

**FIGURE 18.** Physical education teachers' usage and perceptions of the effectiveness of various digital tools for increasing physical education content knowledge and skills

Well-being and health tools
87%
90%

Social media
68%
65%

Video-streaming services
88%
65%

Communication and portfolio tools
92%
55%

Learning management systems
84%
52%

Free resources for educators
83%
38%

Productivity and presentation tools
80%
38%

Digital games
82%
34%

Assistive technology
89%
29%

Digital creation tools
59%
27%

Core curricular programs
97%
27%

Supplemental apps or websites
90%
24%

- Used tool 2–3 times per month
- Rated tool "moderately," "very," or "extremely" effective

## Assistive Technology

Teachers were asked about their experiences using assistive technology in their classrooms and provided with a definition in the survey: "An assistive technology (AT) is a device or approach that a person can use to perform certain important activities. For individuals with learning and attention issues or other disabilities, they might include such tools as text-to-speech technology, and dictation software." Part of digital equity includes ensuring that students with different needs can access devices or software that enable them to learn, communicate, and participate inside the classroom.

Teachers generally reported positive experiences with AT, although there may be room for growth in perceptions of the fairness of the advantages that AT affords students who use them. Nearly nine out of 10 teachers (88 percent) agreed that AT is a good way for students to access information and demonstrate knowledge. Approximately six out of 10 teachers (55 percent) disagreed that AT gives students an unfair advantage over other students, while almost a quarter agreed (24 percent) (Figure 19).

The primary reasons that teachers did not use AT in their classrooms more than they currently did generally had to do with access to equipment and training (Figure 20). Forty-five percent of teachers identified "access to equipment" as a barrier to using AT more often, while 31 percent identified "lack of training/knowledge of what is available." Teachers in Title I schools were more likely to report insufficient access to equipment than teachers in non-Title I schools (48 percent vs. 40 percent), as were teachers in urban schools compared to teachers in suburban schools (50 percent vs. 41 percent). The third most common barrier was "lack of time," reported by 19 percent. Approximately one out of five teachers (17 percent) said they already used AT and did not feel they needed to use AT more. Approximately one out of 10 teachers said their administrations were not supportive of AT (8 percent) and/or that students and/or parents didn't want AT (8 percent). Only a minority of teachers (5 percent) said they didn't use AT and didn't think it was necessary and/or that they didn't use AT more often because "other students think it's unfair" (4 percent). Most teachers who indicated "not applicable" specified that AT was "not needed" by their students or that they did not have students who would benefit from AT.

### FIGURE 19. Teachers' experiences with assistive technologies

There are children in my class who have an unfair advantage over other students because they use assistive technologies.

| 24% | 21% | 55% |

Assistive technologies are a good way for students who need them to access information and demonstrate knowledge

| 88% | 10% | 2% |

■ Strongly agree, somewhat agree  ■ Neither agree nor disagree
■ Strongly disagree, somewhat disagree

### FIGURE 20. Teachers' reasons for not using AT in their classrooms more than they do currently

Insufficient access to equipment
| 45% |

Lack of training/knowledge of what is available
| 31% |

Lack of time
| 19% |

Already use AT and don't need to do more
| 17% |

Not applicable
| 9% |

Administration is not supportive
| 8% |

Student and/or parents don't want AT
| 8% |

Don't use AT and don't think it's necessary
| 5% |

Other
| 4% |

Other students think it's unfair
| 4% |

## Additional Disaggregated Findings

*School Title I status.* Overall, there were no differences in the usage of video-streaming services or productivity and presentation tools according to Title I status of the teachers' schools. However, teachers in Title I schools were more likely to report using several types of digital products with their students as compared to those in non-Title I schools: supplemental apps or websites, free resources for educators, learning management systems, digital games, communication and portfolio tools, core curricular programs, assistive technology, and tools for well-being and health.

Although teachers in Title I schools were more likely to report using certain types of digital products with students in their classrooms, the average number of digital tools they used did not differ significantly from those used by teachers in more affluent schools (Figure 21).

**FIGURE 21. Average number of digital tool types teachers used, by school's Title I status**
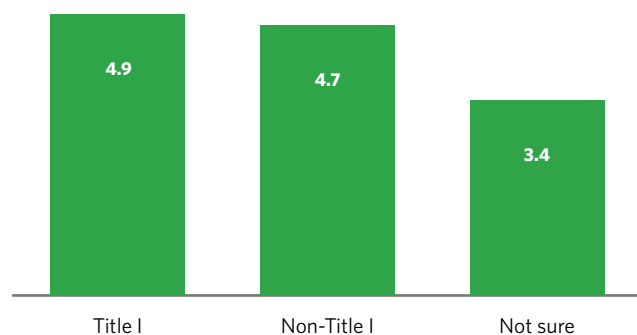


*Subject areas.* Foreign language teachers most often used a few types of digital technologies:

- **Productivity and presentation tools** (e.g., Google G Suite for Education, Microsoft Office 365, Nearpod) were most often used by foreign language teachers and least used by fine arts teachers.

- **Learning management systems** (e.g., Google Classroom, Canvas, Moodle) were used by foreign language teachers more than social studies, fine arts, or PE teachers and least used by fine arts or PE teachers.

- **Social media** (e.g., Twitter, Facebook) was used more often by foreign language teachers than teachers of other subjects. Teachers of fine arts, ELA, and social studies used social media slightly more often than teachers of math or science.

Math teachers tended to report use and non-use of a couple of types of technologies:

- **Core curricular programs** (e.g., Read 180, Achieve 3000, Edmentum) were used by math teachers more than teachers of any other subject and used more often by math, science, and social studies teachers than by PE teachers.

- **Video-streaming services** (e.g., YouTube, SchoolTube, Netflix) were seldom used by math teachers.

Other technologies were used by teachers of a variety of subjects, generally with the exception of fine arts, PE, and foreign language teachers:

- **Digital games** (e.g., *Minecraft*, *BrainPop*, *DreamBox*) were used more often by science teachers than teachers of any other subject and more often by social studies, math, and ELA teachers than by teachers of foreign language, PE, or fine arts.

- **Supplemental apps or websites** (e.g., Khan Academy, IXL, Kahoot!) were used by math teachers more often than by ELA teachers and more often by teachers of math, science, social studies, foreign language, and ELA than by fine arts or PE teachers.

- **Communication and portfolio tools** (e.g., Remind, ClassDojo, Seesaw) were used more by science teachers than teachers of ELA, social studies, fine arts, or PE and used more often by math, social studies, and foreign language teachers than by fine arts or PE teachers.

- **Well-being and health tools** (e.g., GoNoodle, Mind Yeti, Amaze) were most often used by social studies, science, math, and PE teachers and least used by fine arts and foreign language teachers.

- **Free resources for educators** (e.g., PBS, National Geographic, OER) were used more by social studies and science teachers than by math, ELA, or fine arts teachers and least used by fine arts teachers.

- **Digital creation tools** (e.g., iMovie, Photoshop, Scratch) were most often used by fine arts, foreign language, and PE teachers and used less often by math teachers than by teachers of ELA or the aforementioned subjects.

- **Assistive technology** (e.g., Texthelp, Bookshare, text-to-speech software) were used most often by teachers of "other" subjects and least often by fine arts teachers.

- **Not using educational technology products** was most often reported by teachers of fine arts and PE.

# ACCESS TO TECHNOLOGY FOR CLASSROOM LEARNING

THIS CHAPTER EXAMINES U.S. K–12 teachers' reports about their students' access to technology devices for classroom learning at home and at school, considering grade level and other school features. This chapter also discusses findings related to parent-teacher communication about classroom technology.

- Teachers with 21 or more years of experience are more likely than teachers with one to five years of teaching experience to never assign homework that requires such digital access outside of school (43 percent of teachers with 21 or more years of experience vs. 37 percent of teachers with one to five years of experience).

- Approximately a third of teachers (29 percent) said it would limit their students' learning "a great deal" or "quite a bit" if their students didn't have home access to a computer or the internet. Many teachers (42 percent) did not believe it would limit their students' learning very much if their students did not have access to a computing device or the internet at home.

- Teachers in schools with student populations of predominantly students of color were more likely to say that it would limit their students' learning "a great deal" or "quite a bit" if their students did not have adequate access to broadband internet or a computing device at home to do homework (34 percent), as compared to teachers in schools with a mix of white students and students of color or teachers in schools with predominantly white students (26 percent vs. 27 percent, respectively).

- Teachers in schools serving predominantly students of color were less likely to agree that technology has made it easier to have meaningful parent communication. However, three out of four teachers overall agree that technology has made it easier to have meaningful communication with parents.

- High school teachers were more likely than elementary school teachers to agree that parents have expressed concerns that their school requires too much technology use (22 percent vs. 14 percent, respectively).
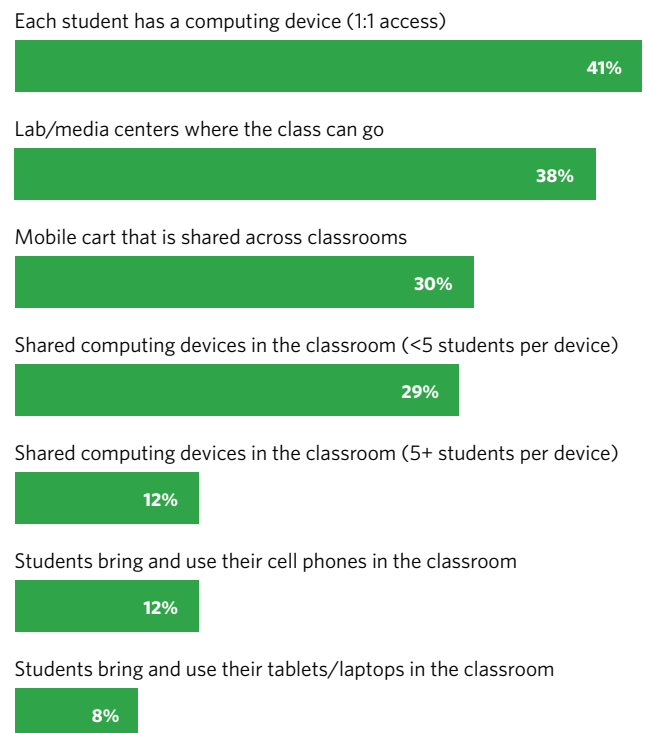
## Classroom Access to Technology

Teachers were asked to indicate what type of access best described their students' access to a computing device in their classrooms (e.g., computer, laptop, tablet, or Chromebook) and to "check all that apply." The majority of teachers selected one primary way that their students accessed technology in their classrooms (58 percent), whereas the remainder selected two (21 percent), three (15 percent), or four or more ways that their students accessed technology in their classrooms (6 percent).

Eight out of 10 U.S. K–12 teachers had either 1-to-1 access or shared computing devices in their classrooms (82 percent). Four out of 10 U.S. K–12 teachers (41 percent) said their students had 1-to-1 access, three out of 10 (29 percent) said their students shared devices with fewer than five students per device, and one out of 10 (12 percent) said their students shared devices with more than five students per device (Figure 22).

Roughly a third of teachers (38 percent) reported that there is a lab/media center where their class could go to use computing devices. Teachers who used a lab/media center as the "best" method by which their students obtained access to computing devices tended to use a mobile cart for access to computing devices ($r = .43$, $p < .01$) and tended not to have 1-to-1 access in their classrooms ($r = -.36$, $p < .01$).

**FIGURE 22. Students' access to classroom computing devices**

Each student has a computing device (1:1 access)
41%

Lab/media centers where the class can go
38%

Mobile cart that is shared across classrooms
30%

Shared computing devices in the classroom (<5 students per device)
29%

Shared computing devices in the classroom (5+ students per device)
12%

Students bring and use their cell phones in the classroom
12%

Students bring and use their tablets/laptops in the classroom
8%

About one in three teachers (30 percent) reported that their students primarily accessed computing devices via a mobile cart that is shared across classrooms. Teachers who primarily used a mobile cart for access to computing devices tended not to have 1-to-1 access in their classrooms ($r$ = -.34, $p$ < .01).

Approximately one out of six teachers (16 percent) reported that their students' access to a computing device in their classrooms was best described as students bringing their own computing devices to the classroom, including their own cellphones and/or their own tablets or laptops. Students brought and used their own cellphones to the classroom more often than their own tablets or laptops (12 percent vs. 8 percent, respectively).
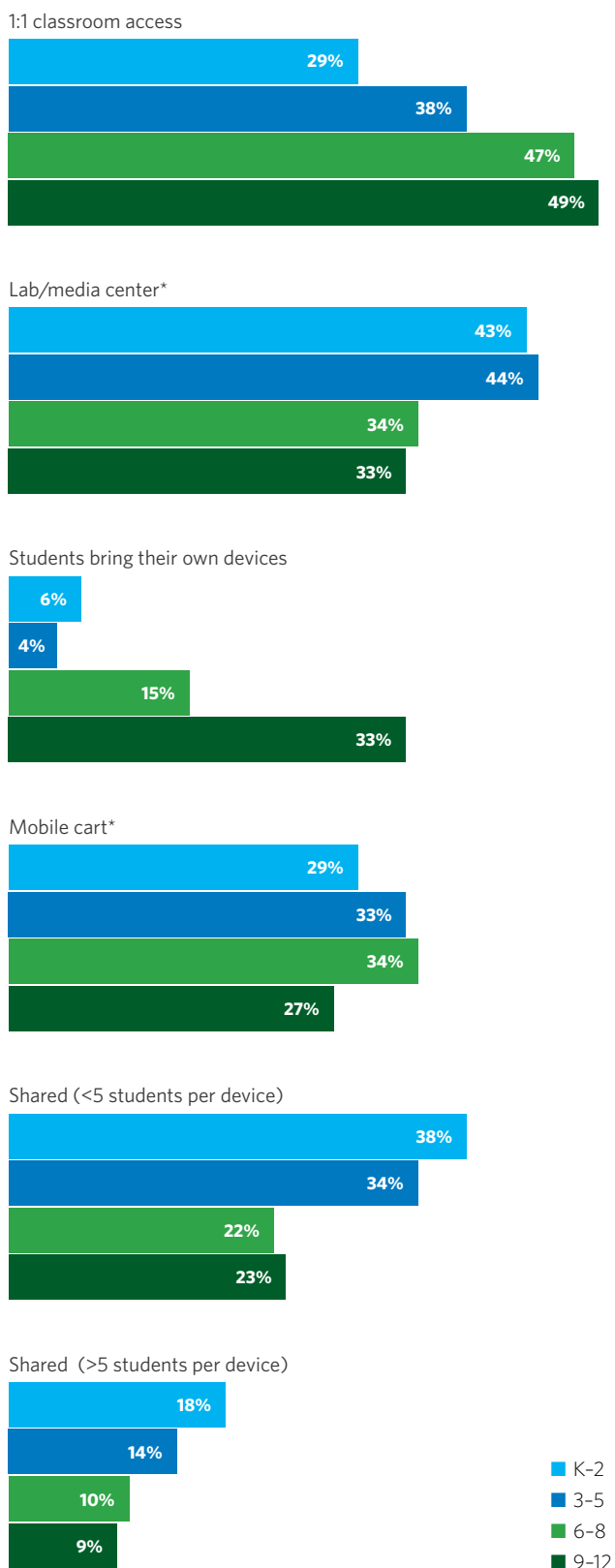
## Classroom Access to Technology Increases with Grade Level

As shown in Figure 23, 1-to-1 access increased with grade level. High school and middle school teachers were more likely than K–5 teachers to report that their students had 1-to-1 classroom access to computing devices, while teachers of grades 3–5 were more likely than K–2 teachers to report the same (49 percent of high school and 47 percent of middle school teachers vs. 38 percent of grade 3–5 teachers and 29 percent of K–2 teachers reported 1-to-1 classroom access).

High school teachers were more likely than teachers of other grade levels to report that their students brought their own devices and used them in the classroom as the primary mode of classroom technology access: Thirty-three percent of high school teachers reported that students brought their own devices, as compared to 15 percent of middle school teachers, 4 percent of grade 3–5 teachers, and 6 percent of K–2 teachers. Middle school teachers also were more likely than K–5 teachers to report students bringing their own devices as the primary mode of access to technology in their classrooms.

It might seem that having 1-to-1 classroom access to technology (most commonly reported by high school teachers) is a consequence of students bringing their own devices to the classroom and using them for learning. However, 1-to-1 access and students bringing their own devices to the classroom were negatively correlated across grade levels ($r$ = -.11, $p$ < .01) and even more so among high school teachers ($r$ = -.23, $p$ < .01). Thus, the data suggest that 1-to-1 access is an increasingly critical tool for learning in middle and high school, so middle and high school students are bringing their own digital devices into the classroom in the absence of being provided with 1-to-1 devices or as a supplement to classroom-provided 1-to-1 access.

FIGURE 23. Classroom access to computing devices, by grade level



FIGURE 23. Classroom access to computing devices, by grade level

1:1 classroom access
- 29%
- 38%
- 47%
- 49%

Lab/media center*
- 43%
- 44%
- 34%
- 33%

Students bring their own devices
- 6%
- 4%
- 15%
- 33%

Mobile cart*
- 29%
- 33%
- 34%
- 27%

Shared (<5 students per device)
- 38%
- 34%
- 22%
- 23%

Shared (>5 students per device)
- 18%
- 14%
- 10%
- 9%

- K–2
- 3–5
- 6–8
- 9–12

*Shared across classrooms

Teachers of K–5 were more likely than teachers of grades 6–12 to report having shared computing devices in their classrooms, with fewer than five students per device (38 percent of K–2 teachers and 34 percent of grade 3–5 teachers vs. 22 percent of grade 6–8 teachers and 23 percent of high school teachers). Teachers of grades 3–5 more often reported having classroom access to devices than teachers in middle schools (83 percent vs. 75 percent, respectively). In addition, K–5 teachers were more likely than teachers of grades 6–12 to report having a computer lab as their primary mode of access (43 percent of K–5 teachers vs. 33 percent of grade 6–12 teachers). Finally, K–2 teachers were more likely than grade 6–12 teachers to report having shared devices with more than five students per device (18 percent of K–2 teachers vs. 10 percent of grade 6–8 teachers and 9 percent of high school teachers).

These results correspond with teachers' reports about their usage of digital tools with students in their classrooms, in which K–2 teachers reported using the fewest digital tools or no digital tools at all and teachers of grades 3–5 reported using more types of digital tools with students in their classrooms than teachers of other grade levels. Taken together, these results suggest that teachers scaffold students' use of computing devices in grades 3–5 with a variety of digital tools and shared computing devices. Teachers of grades K–2 might begin scaffolding usage of

computing devices with shared devices and fewer digital tools. Middle and high school teachers use fewer digital tools with their students, with increasingly sustained, independent student work that requires 1-to-1 access to computing devices.

Teachers who indicated that students were allowed to bring their own cellphones into the classroom for learning (12 percent) were also asked as a follow-up question if they had instituted a specific cellphone policy in their classrooms. Among these teachers, 75 percent indicated "yes" and 25 percent indicated "no."

## Access to Technology for Classroom Learning at Home

Teachers were asked, "In your classroom, approximately what percentage of students do not have adequate broadband Internet and/or digital devices at home to do school work at home that would require using the Internet or a computer?" Approximately four out of 10 K-12 teachers said that the majority of their students (80 percent or more) had adequate home access to a computer or the internet to do homework that required such access (Table 3). Approximately another four out of 10 said that many of their students did not have adequate home access to the internet or a computer to do schoolwork at home (21 percent to 60 percent of their students). Approximately one out of 10

**TABLE 3. Students who lack adequate access to broadband internet and/or digital devices to do schoolwork at home**

| Teachers who say the following percentage of students do not have adequate access at home | | 0%–20% n = 476 | 21%–40% n = 264 | 41%–60% n = 177 | 61%–80% n = 96 | 81%–100% n = 46 |
|---|---|---|---|---|---|---|
| **Total** | | **39.4%** | **21.8%** | **14.7%** | **8.0%** | **3.8%** |
| **Grade level** | • K–2 | 40.7%[ab] | 15.5% | 16.5% | 6.6% | 4.9% |
| | • 3–5 | 34.2%[a] | 22.8% | 14.8% | 10.4% | 5.3% |
| | • 6–8 | 38.7%[ab] | 21.2% | 16.2% | 6.8% | 3.1% |
| | • 9–12 | 42.7%[b] | 26.4% | 12.1% | 8.0% | 2.5% |
| **Regional setting** | • Rural | 31.8%[a] | 24.7% | 19.3%[a] | 9.5%[a] | 2.6% |
| | • Urban | 30.0%[a] | 20.6% | 18.2%[a] | 13.9%[a] | 5.7% |
| | • Suburban | 48.2%[b] | 21.0% | 10.5%[b] | 4.0%[b] | 3.4% |
| **Racial/ethnic diversity** | • 75%+ white students | 51.9%[a] | 19.5% | 8.7%[a] | 5.2%[a] | 1.8%[a] |
| | • 75%+ students of color | 22.3%[b] | 23.8% | 19.3%[b] | 15.5%[b] | 7.2%[b] |
| | • Diverse (26%–74% white) | 42.8%[c] | 22.2% | 15.8%[b] | 4.4%[a] | 2.7%[a] |
| **Title 1 status** | • Title 1 | 28.5%[a] | 25.4% | 18.8% | 12.3%[a] | 4.8%[a] |
| | • Non-Title 1 | 54.4%[b] | 17.0% | 9.0% | 2.0%[b] | 2.4%[b] |

Notes: Superscripts (*a,b,c*) are used to denote whether differences between groups are statistically significant (*p*<.05). Items with different superscripts differ significantly. Items that do not have a superscript, or that share a common superscript, do not differ significantly. Significance should be read down columns within each category. See page 5 for further definition of demographic groups.

teachers (12 percent) reported that the majority of their students (61 percent to 100 percent) did not have home access to the internet or a computer. Approximately one out of 10 teachers was not sure what type of home access their students had.
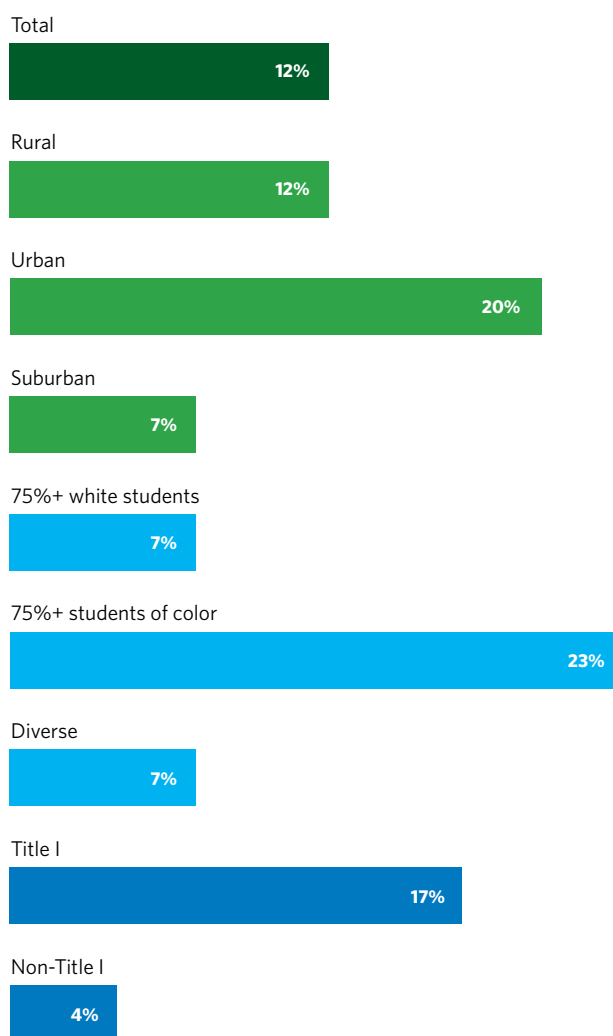
Teachers who reported that a majority of their students did not have adequate home access to the internet or a computer (61 percent to 80 percent and 81 percent to 100 percent of their students) were more likely to teach in schools with Title I status and in schools in which students of color made up more than 75 percent of the student population (as compared to predominantly white schools and to mixed student populations made up of white students and students of color)(Figure 24). Teachers of K–12 who reported that a minority of their students (0 percent to 20 percent) lacked home access to the internet or a computer were more likely to teach in suburban schools (as compared to rural or urban schools) and were more likely to teach in schools with predominantly white student populations (as compared to schools with student populations made up of predominantly students of color or mixed student populations with white students and students of color) (Table 3, page 31).

Teachers whose students had higher levels of home access to the internet and computing devices were more likely to teach high school than grades 3–5, suggesting that students may be more likely to obtain their own computing devices and internet access as they grow older.

As shown in Figure 25, just under half of K–12 teachers never or seldom assigned homework that required students to have access to digital devices and/or broadband internet outside of school. Nine percent of teachers assigned homework that required access to digital devices and/or broadband internet outside of school three to 10 times a year. Approximately one out of 10 assigned such homework once a month (12 percent), and approximately three out of 10 (30 percent) assigned homework that required access to digital devices outside of school at least once a week.
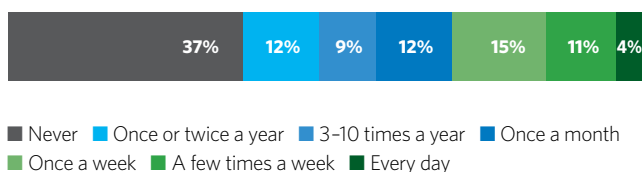
However, as grade levels increased, teachers were more likely to assign homework that required access to digital devices and/or broadband internet outside of school. Teachers of grades 6–12 were more likely than teachers of K–5 to assign homework at least once a week that required access to digital devices and/or broadband internet outside of school (41 percent of high school teachers and 34 percent of middle school teachers vs. 23 percent of grade 3–5 teachers and 20 percent of K–2 teachers). Teachers of grades K–2 were more likely never to assign homework that required such digital access outside of school, as compared to

**FIGURE 24. Teachers who say at least 61 percent of students do not have adequate access to broadband internet and/or digital devices to do schoolwork at home, by demographic group**



Total **12%**

Rural **12%**

Urban **20%**

Suburban **7%**

75%+ white students **7%**

75%+ students of color **23%**

Diverse **7%**

Title I **17%**

Non-Title I **4%**

Note: See page 5 for further definition of demographic groups.

**FIGURE 25. Frequency with which teachers assign homework that requires access to digital devices and/or broadband internet outside of school**



| 37% | 12% | 9% | 12% | 15% | 11% | 4% |

■ Never ■ Once or twice a year ■ 3–10 times a year ■ Once a month
■ Once a week ■ A few times a week ■ Every day

teachers of other grade levels. Approximately half of K–2 teachers (53 percent), four out of 10 grade 3–5 teachers (41 percent), three out of 10 grade 6–8 teachers (34 percent), and two out of 10 high school teachers (24 percent) never assigned homework that required such digital access outside of school. Teachers of grades 3–8 were also more likely than high school teachers never to assign homework that required such digital access outside of school.

Teachers who assigned homework that required access to digital devices and/or broadband internet outside of school were more likely to teach in affluent, non-Title I schools than in Title I schools. Approximately four out of 10 teachers (42 percent) in Title I schools never assigned homework that required such digital access outside of school, as compared to three out of 10 teachers (31 percent) in non-Title I schools who never did so. Teachers in rural school settings were also more likely than teachers in urban settings never to assign homework that required such digital access outside of school (45 percent of teachers in rural settings vs. 38 percent of teachers in urban settings).

Finally, teachers with less teaching experience (one to 10 years) were more likely than teachers with 21 or more years of teaching experience to assign homework at least weekly that required such digital access outside of school. A third of teachers (33 percent) with one to five years of experience, and 36 percent of teachers with six to 10 years of experience, assigned homework at least weekly that required such digital access outside of school, as compared to 28 percent of teachers with 11 to 20 years of experience and 24 percent of teachers with 21 or more years of experience. Teachers with 21 or more years of experience were more likely than teachers with one to five years of experience never to assign homework that required such digital access outside of school (43 percent of teachers with 21 or more years of experience vs. 37 percent of teachers with one to five years of experience).

Approximately a third of teachers said that it would limit their students' learning "a great deal" or "quite a bit" if their students didn't have home access to a computer or the internet. Approximately a third of teachers felt that it would limit their students' learning "some" (30 percent). However, many teachers (42 percent) did not believe it would limit their students' learning very much if their students did not have access to a computing device or broadband internet at home (Figure 26), though this changed when it came to students in upper grades.

**FIGURE 26. Teachers' perceptions of whether students' home access to broadband internet and computing devices limits classroom learning**



| 12% | 29% | 30% | 20% | 9% |

■ Not at all   ■ Very little   ■ Some   ■ Quite a bit   ■ A great deal
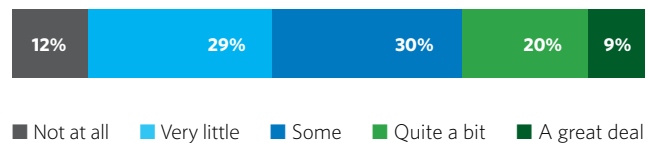
Middle and high school teachers were more likely than K–2 teachers to say that it would limit their students' learning "a great deal" or "quite a bit" if their students did not have adequate access to broadband internet or a computing device at home to do homework (35 percent of high school teachers and 31 percent of middle school teachers vs. 22 percent of K–2 teachers and 24 percent of grade 3–5 teachers). High school teachers were the least likely to say that it would not limit their students' learning at all if their students lacked digital access to do homework outside of school (8 percent of high school school teachers vs. 17 percent of K–2 teachers, 13 percent of grade 3–5 teachers, and 13 percent of grade 6–8 teachers).

Teachers in schools with student populations of predominantly students of color were more likely to say it would limit their students' learning "a great deal" or "quite a bit" if their students did not have adequate access to broadband internet or a computing device at home to do homework (34 percent), as compared to teachers in schools with a mix of white students and students of color or teachers in schools with predominantly white students (26 percent and 27 percent, respectively). Teachers in urban school settings were more likely than teachers in rural or suburban settings to say that it would limit their students' learning "a great deal" or "quite a bit" if their students did not have adequate access to broadband internet or a computing device at home to do homework (35 percent of teachers in urban school settings vs. 25 percent of teachers in rural school settings and 27 percent of teachers in suburban school settings).

Finally, public school teachers were more likely than private school teachers to say it would limit their students' learning "a great deal" or "quite a bit" if their students did not have adequate access to broadband internet or a computing device at home to do homework (30 percent of teachers in public schools vs. 18 percent of teachers in private schools). Conversely, private school teachers were more likely to say that it would not limit their students' learning at all if their students lacked digital access to do homework outside of school (24 percent of private school teachers vs. 11 percent of public school teachers).

## Additional Disaggregated Findings for Classroom Technology Access

Access to classroom devices was more commonly reported by teachers in public schools than by teachers in private schools (81 percent vs. 21 percent, respectively); by teachers in Title I schools than by teachers in non-Title I schools (81 percent vs. 75 percent); and by teachers in schools with a mix of white students and students of color than by teachers in schools with predominantly white students or predominantly students of color (82 percent vs. 76 percent and 77 percent, respectively).

*School type.* Public school teachers reported more often than teachers in private schools that they had 1-to-1 access to technology in their classrooms (43 percent vs. 29 percent, respectively). Public school teachers also reported more often than private school teachers that they had shared devices with fewer than five students per device (30 percent vs. 19 percent, respectively).

*School racial/ethnic diversity.* Teachers in schools with student populations predominantly composed of students of color reported more often that their classroom access to technology primarily consisted of shared devices with more than five students per device as compared to teachers in schools with predominantly white student populations (15 percent of teachers in schools with predominantly students of color vs. 10 percent of teachers in predominantly white schools).

*Title I status.* Teachers in non-Title I (more affluent) schools were more likely to report that their classroom access to technology primarily consisted of students bringing their own devices (20 percent of teachers in non-Title I schools vs. 13 percent of teachers in Title I schools).

*Subject areas.* Science, math, and social studies teachers reported having access to classroom devices more often than teachers of fine arts (83 percent of teachers of science, math, and social studies vs. 77 percent of teachers of fine arts).

**Teachers who assigned homework that required access to digital devices and/or broadband internet outside of school were more likely to teach in affluent, non-Title I schools than in Title I schools.**

## Teacher and Parent Communication About EdTech

Teachers were asked about whether technology generally had made it easier to communicate with parents. The majority of K–12 teachers agreed that technology had made it easier to have meaningful communication with parents (76 percent), with 15 percent neither agreeing nor disagreeing and only 9 percent disagreeing. However, these teachers were generally in schools in suburban settings, with student populations consisting of both students of color and white students or of predominantly white students (Figure 27). Fewer teachers in schools with student populations consisting of predominantly students of color agreed strongly or conclusively that technology had made it easier to have meaningful conversations with parents (44 percent). This result suggests that technology may present some barriers to communication with parents in schools that serve predominantly students of color. Teachers were also asked whether parents had expressed concerns to them about the amount of technology their schools required (Figure 28).

Across K–12 grade levels, only 16 percent of teachers agreed (choosing "strongly agree," "agree," or "somewhat agree") that parents had expressed concerns about the amount of technology required by their schools, regardless of whether that amount was too much or too little. High school teachers were more likely than elementary school teachers to agree that parents had expressed concerns that their schools required too much technology use

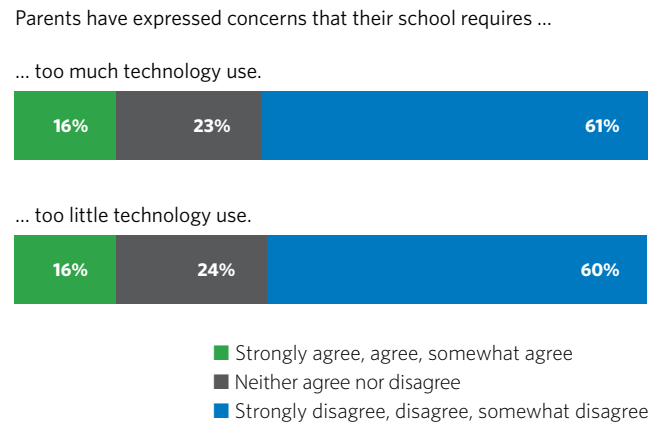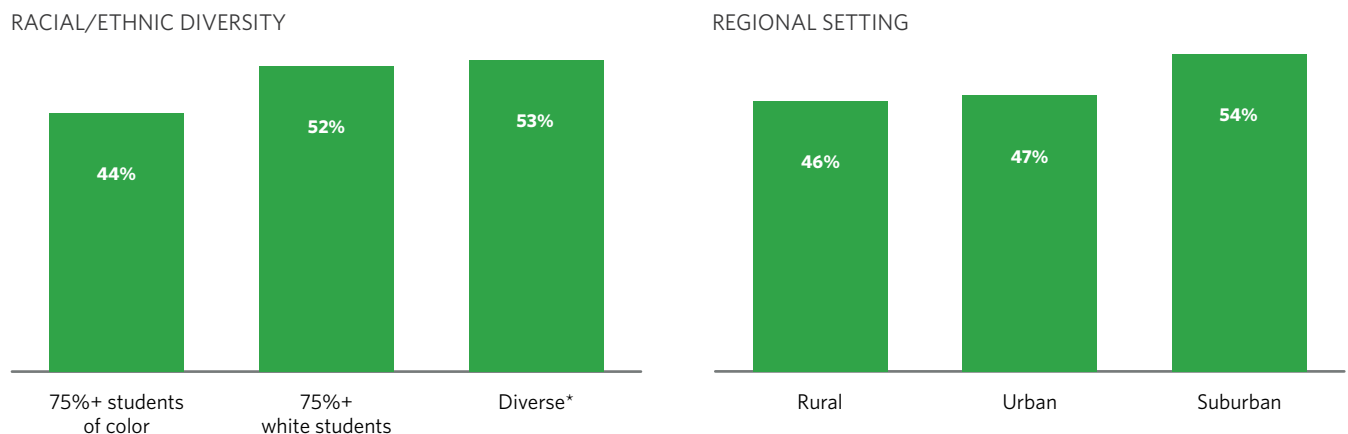**FIGURE 28. Parent-teacher communication about educational technology**

Parents have expressed concerns that their school requires …

… too much technology use.

| 16% | 23% | 61% |
|-----|-----|-----|

… too little technology use.

| 16% | 24% | 60% |
|-----|-----|-----|

- ■ Strongly agree, agree, somewhat agree
- ■ Neither agree nor disagree
- ■ Strongly disagree, disagree, somewhat disagree

**FIGURE 27. Teachers who agree/strongly agree that technology has made it easier to have meaningful communication with parents**

RACIAL/ETHNIC DIVERSITY

| 75%+ students of color | 75%+ white students | Diverse* |
|------------------------|---------------------|----------|
| 44% | 52% | 53% |

REGIONAL SETTING

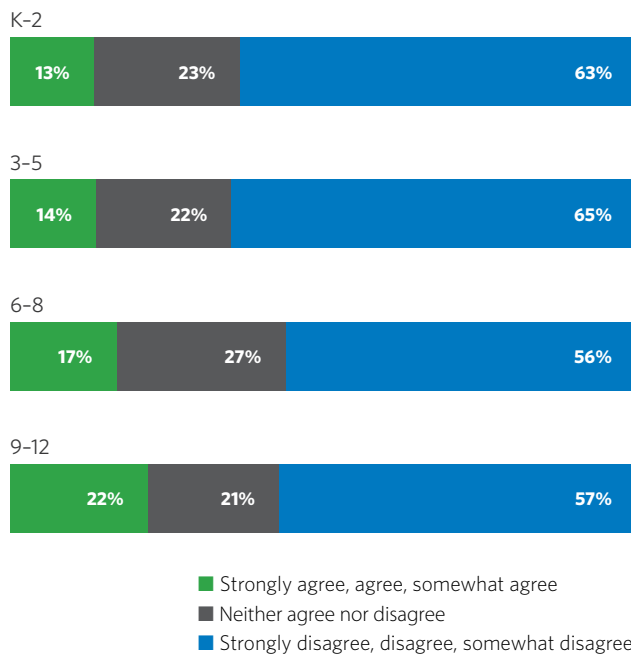| Rural | Urban | Suburban |
|-------|-------|----------|
| 46% | 47% | 54% |

*See page 5 for further definition of demographic groups.

(Figure 29). Overall, there did not seem to be a great deal of concern from parents about the amount of technology that schools required, and what little concern parents had expressed to teachers appeared more often in high schools and related to schools using too much technology.

Communication about students' use of educational technology was more common when it related to school purposes rather than nonschool purposes. Most teachers and parents communicated at least a few times a year about students' usage of educational technology, whether for nonschool or school purposes. Approximately 40 percent of K–12 teachers communicated at least monthly with parents about educational technology for school purposes, whereas a third communicated at least monthly with parents about technology for nonschool purposes (Figure 30). Approximately one-fifth of K–12 teachers never communicated with parents about their children's use of educational technology for school purposes, whereas a third never communicated with parents about educational technology for nonschool purposes. Teachers in schools with predominantly white students were less likely to communicate with parents about their children's use of technology as compared to teachers in schools with student populations consisting of both students of color and white students.

**FIGURE 30. Frequency of parent-teacher communication about technology for school/nonschool purposes**

How often do you communicate with parents about their child's use of technology for ...

Nonschool purposes

| 34% | 21% | 13% | 14% | 10% | 6% | 2% |

School purposes

| 19% | 22% | 17% | 20% | 11% | 8% | 3% |

■ Never  ■ Once or twice a year  ■ 3–10 times a year  ■ Once a month
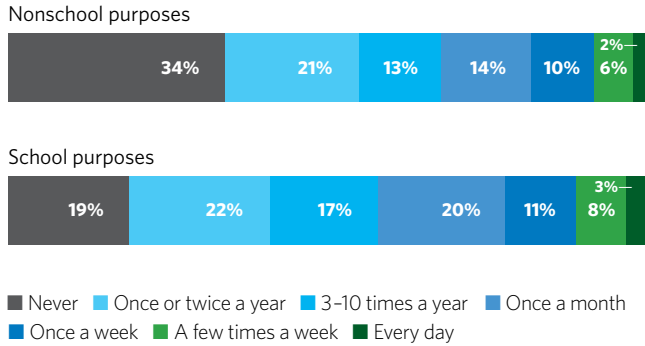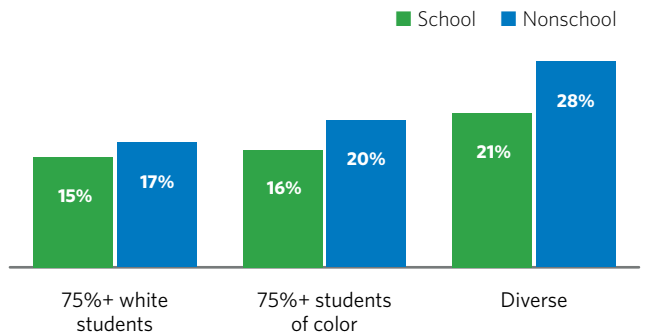■ Once a week  ■ A few times a week  ■ Every day

**FIGURE 31. Parent-teacher communication about technology, by racial/ethnic diversity of students**

Teachers who communicate with parents at least weekly about their child's use of technology for school/nonschool purposes

■ School  ■ Nonschool

| | School | Nonschool |
|---|---|---|
| 75%+ white students | 15% | 17% |
| 75%+ students of color | 16% | 20% |
| Diverse | 21% | 28% |

**FIGURE 29. Teachers who disagree/agree that parents have expressed concerns about the school requiring too much technology use, by grade level**

K–2

| 13% | 23% | 63% |

3–5

| 14% | 22% | 65% |

6–8

| 17% | 27% | 56% |

9–12

| 22% | 21% | 57% |

■ Strongly agree, agree, somewhat agree
■ Neither agree nor disagree
■ Strongly disagree, disagree, somewhat disagree

Note: Segments may not total 100% due to rounding.

# TECHNOLOGY-INTEGRATION POLICIES

THIS CHAPTER EXPLORES TEACHERS' reports about their school policies related to educational technology. In addition, it explores how teachers' reports about the presence of digital citizenship policies at their schools correlates with their teaching of digital citizenship competencies, their observations of technology-related concerns, and their participation in professional development that covers digital citizenship.

## HIGHLIGHTS

- **The most common type of technology policy that schools implement is a cellphone policy (80 percent)**, followed by a student data privacy policy (74 percent), a technology acceptable/responsible use policy (72 percent), and a social media policy (71 percent). Approximately half of teachers' schools (48 percent) implemented digital citizenship policies.

- **Approximately a third of high school teachers' schools do not implement digital citizenship policies, and approximately a quarter said their schools do not implement cellphone policies.** Teachers of grades 3–8 were more likely than K–2 or high school teachers to report that their schools had implemented cellphone policies (85 percent of grade 3–5 teachers and grade 6–8 teachers vs. 78 percent of K–2 teachers and 73 percent of high school teachers).

- **Approximately a quarter of teachers find cellphone policies difficult to follow, while roughly two-thirds find them easy to follow.** Teachers found the student data privacy policies, social media policies, and technology acceptable/responsible use policies easier to follow than cellphone policies.

- **High school teachers were more likely than teachers of other grade levels to report that implementing cellphone policies, social media policies, and digital citizenship policies in their classrooms was difficult.**

- **Approximately nine out of 10 teachers participated in school- or district-provided professional development (PD) to support their classroom technology use during the last school year.** Of teachers who received such PD in the last school year, teachers spent 14.3 hours on average in school- or district-provided PD to support their classroom technology use. However, 48 percent of teachers received under five hours of PD, including 13 percent who received none at all.

- **Only four out of 10 teachers consider the PD they received to support their use of educational technology to be "very" or "extremely" effective.**

- **Teachers in schools with digital citizenship policies are more likely to teach digital citizenship competencies, to learn about digital citizenship in their school- or district-provided PD, and to view the digital citizenship curricula or resources they used as effective.**

- **Eight out of 10 teachers reported that they make the decision about whether or not to use digital products in their classrooms, with middle and high school teachers being more likely to say that they make the decision as compared to elementary school teachers.** Although most teachers checked an approved list or confirmed that technology products complied with school or district policies, most had autonomy over whether or not they used approved digital products in the classroom.

- **Approximately a third of teachers said that they did not, or practically never, used a technology product that was provided to them by their school or district.** Top reasons for not using such products were that they were not relevant to students' learning needs, not engaging for students' learning, or not effective for developing their knowledge and/or skills.

- **When asked what they did not like about the technology that their school or district provided, teachers cited insufficient access to equipment, old or outdated equipment, technology being hard or difficult to use, and/or technology being unreliable, breaking down, or otherwise not working.** When asked what they liked about the technology that their school or district provided, most teachers cited the educational value, convenience, and usability, and many appreciated having sufficient access to and variety in their technology.

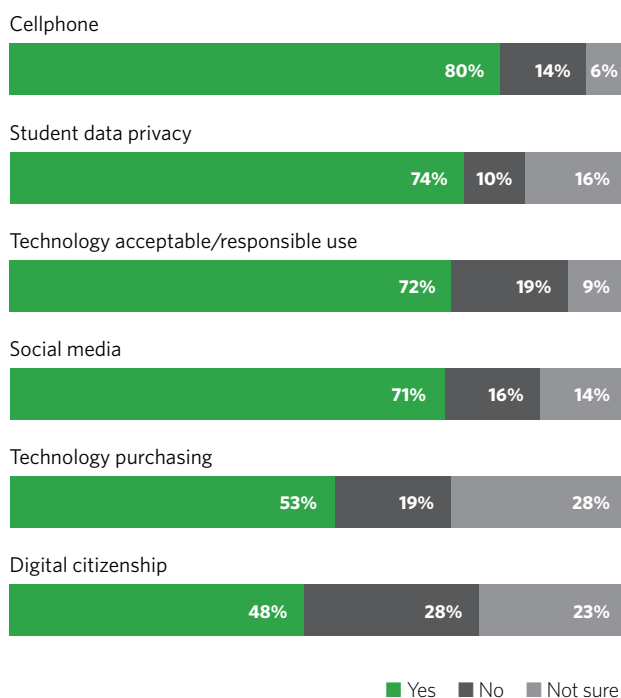## Teachers' Classroom Implementation of School EdTech Policies

Teachers were asked, "Thinking about the policies at your school to address educational technology, does your school implement any of the following types of policies to address students' use of educational technology?" Then they were presented with a list of policies and definitions for each policy[9], as well as an "other" option with a write-in response[10] (Figure 32).

Cellphone policies were the most common type of educational technology policy that teachers knew about and said their schools implemented (80 percent) (Figure 32). The other common types of technology policies that teachers reported their schools implemented were: student data privacy policies (74 percent of teachers), technology acceptable/responsible use policies (72 percent of teachers), and social media policies (71 percent of teachers). Approximately half of teachers said that their schools implemented digital citizenship policies (48 percent of teachers). Teachers were the least sure about whether their schools had digital citizenship policies or technology-purchasing policies (approximately a quarter of teachers did not know whether their schools had either of these policies).

Teachers of grades 3-8 were more likely than K–2 or high school teachers to report that their schools had implemented cellphone policies (85 percent of grade 3–5 and grade 6–8 teachers vs. 78 percent of K–2 and 73 percent of high school teachers). Teachers of grades 3–5 were more likely than teachers of other grade levels to report that their schools had implemented student data privacy policies (82 percent of grade 3–5 teachers vs. 71 percent of K–2 and 72 percent of middle and high school teachers). High school and middle school teachers were more likely than K–2 teachers to report that their schools had implemented technology acceptable/responsible use policies (79 percent of high school teachers and 74 percent of middle school teachers vs. 63 percent of K–2 teachers and 70 percent of grade 3–5 teachers).

High school teachers were more likely than elementary and middle school teachers to report that their schools did not implement digital citizenship policies: Thirty-four percent of high school teachers vs. 26 percent of middle school and 15 percent of elementary school teachers did not implement digital citizenship policies. High school teachers were also more likely than elementary or middle school teachers to report that their schools

**FIGURE 32. Teachers' reports of their schools' implemention of educational technology policies, by type**

Cellphone
80% | 14% | 6%

Student data privacy
74% | 10% | 16%

Technology acceptable/responsible use
72% | 19% | 9%

Social media
71% | 16% | 14%

Technology purchasing
53% | 19% | 28%

Digital citizenship
48% | 28% | 23%

■ Yes  ■ No  ■ Not sure

did not implement cellphone policies: Twenty-three percent of high school teachers vs. 10 percent of middle school and 10 percent of elementary school teachers did not implement cellphone policies.

Urban school teachers were more likely than teachers in suburban settings to report that their schools did not implement digital citizenship policies (34 percent of urban schools did not implement digital citizenship policies as compared to 26 percent of suburban schools and 29 percent of schools in rural settings who did not implement digital citizenship policies). Urban school teachers also were more likely than teachers in suburban settings to report that their schools did not implement social media policies (20 percent of urban schools did not implement social media policies, as compared to 14 percent of suburban schools and 15 percent of schools in rural settings).

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9.  See Appendix: National Survey Instrument (page 48) for policy definitions provided to teachers.
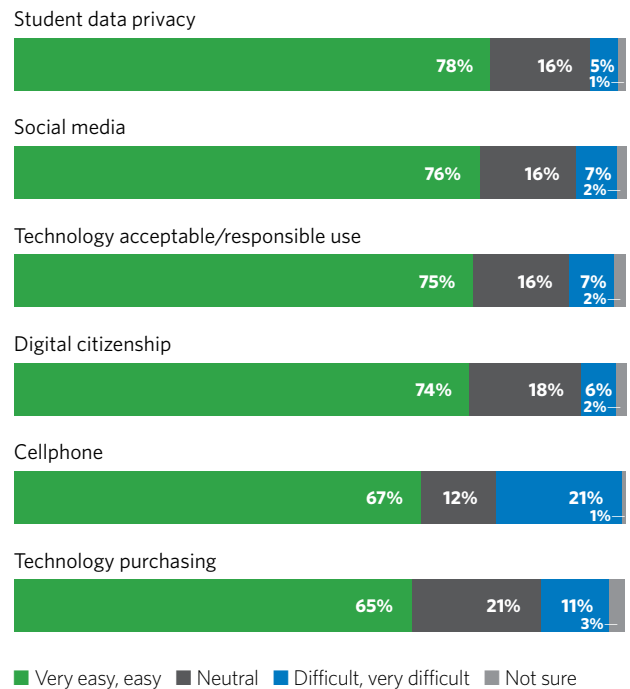
10.  See Appendix: Table A1 (page 49) for "other" technology policy write-in responses.

Finally, teachers in public schools were more likely than teachers in private schools to report that their schools implemented several types of technology policies: student data privacy policies (75 percent of public school teachers reported that their schools implemented student data privacy policies vs. 62 percent of private school teachers), social media policies (72 percent of public school teachers reported that their schools implemented social media policies vs. 61 percent of private school teachers), digital citizenship policies (50 percent of public school teachers reported that their schools implemented digital citizenship policies vs. 39 percent of private school teachers), and technology-purchasing policies (55 percent of public school teachers reported that their schools implemented technology-purchasing policies vs. 38 percent of private school teachers).

Private schools also were more likely than public schools to report that they did not implement several types of technology-related policies, including: digital citizenship policies (37 percent of private schools vs. 28 percent of public schools did not implement digital citizenship policies), technology-purchasing policies (34 percent of private schools vs. 17 percent of public schools did not implement technology-purchasing policies), social media policies (23 percent of private schools vs. 15 percent of public schools did not implement social media policies), and student data privacy policies (17 percent of private schools vs. 9 percent of public schools did not implement student data privacy policies).

For each of the policies that teachers indicated their schools had implemented, teachers were then asked, "For each of these policies, how difficult or easy is it for you to follow each of these policies in your classroom?" Most teachers found their school technology policies "very easy" or "easy" to follow (Figure 33). Two-thirds of teachers felt that cellphone policies were "very easy" or "easy" to follow, whereas a quarter of teachers found school cellphone policies "difficult" or "very difficult" to follow. Teachers generally reported that the student data privacy policies, social media policies, and technology acceptable/responsible use policies were easier to follow than the cellphone policies.

**FIGURE 33. Teachers' perceptions of the ease of implementing their school or district's educational technology policies, by type**

Student data privacy
| 78% | 16% | 5% 1% |

Social media
| 76% | 16% | 7% 2% |

Technology acceptable/responsible use
| 75% | 16% | 7% 2% |

Digital citizenship
| 74% | 18% | 6% 2% |

Cellphone
| 67% | 12% | 21% 1% |

Technology purchasing
| 65% | 21% | 11% 3% |

■ Very easy, easy ■ Neutral ■ Difficult, very difficult ■ Not sure

## Disaggregated Findings for Classroom Implementation of School EdTech Policies

*Grade level.* High school teachers had the hardest time implementing their schools' cellphone policies in their classrooms, compared to teachers of other grade levels: Forty percent of high school teachers reported that implementing cellphone policies was "difficult" or "very difficult" vs. 24 percent of middle school teachers, 9 percent of grade 3–5 teachers, and 6 percent of K–2 teachers. Middle school teachers were also more likely than elementary school teachers to say that implementing cellphone policies in their classrooms was "difficult" or "very difficult."

High school teachers were also more likely than teachers of other grade levels to say that implementing their schools' social media policies was "difficult" or "very difficult" (12 percent of high school teachers vs. 6 percent of middle school and 3 percent of elementary school teachers). Finally, high school teachers were more likely than K–2 teachers and middle school teachers to say that implementing their schools' digital citizenship policies was "difficult" or "very difficult" (9 percent of high school teachers vs. 2 percent of middle school teachers, 3 percent of K–2 teachers, and 7 percent of grade 3–5 teachers).

Middle and high school teachers were more likely than K–2 teachers to say that implementing the technology acceptable/responsible use policies at their schools was "difficult" or "very difficult" (11 percent of high school teachers and 8 percent of middle school teachers vs. 3 percent of K–2 teachers and 5 percent of grade 3–5 teachers).

Meanwhile, teachers of grades K–5 were more likely than middle or high school teachers to report that implementing their schools' cellphone policies in their classrooms was "easy" or "very easy" (79 percent of K–2 teachers and 77 percent of grade 3–5 teachers vs. 64 percent of grade 6–8 teachers and 49 percent of high school teachers). Similarly, teachers of K–5 were more likely than high school teachers to report that implementing social media policies, technology acceptable/responsible use policies, and digital citizenship policies was "easy" or "very easy" to implement in their classrooms (82 percent of K–2 teachers reported that social media policies were easy to implement, compared to 71 percent of high school teachers; eighty percent of K–2 teachers reported that technology acceptable/responsible use policies were easy to implement, compared to 70 percent of high school teachers; and eighty percent of K–2 teachers reported that digital citizenship policies were easy to implement, compared to 67 percent of high school teachers).

*School racial/ethnic diversity.* Teachers at schools with predominantly white student populations were more likely to report that they found implementing their schools' technology acceptable/responsible use policies "difficult" or "very difficult" (15 percent of teachers in schools serving predominantly white student populations vs. 9 percent of teachers in schools serving both white students and at least 26 percent students of color). Teachers in schools serving either predominantly white student populations or predominantly students of color reported that they found implementing the technology acceptable/responsible use policies at their schools to be "difficult" or "very difficult," as compared to teachers in schools serving both white students and at least 26 percent students of color (4 percent of teachers in more mixed schools vs. 11 percent of teachers in schools serving predominantly white students and 8 percent of teachers in schools serving predominantly students of color, respectively).

*School type.* Teachers in public schools reported more often than teachers in private schools that their schools' cellphone policies were "very difficult" or "difficult" to implement in their classrooms (22 percent vs. 11 percent, respectively).

*Title I status.* Teachers in Title I schools reported more often than teachers in non-Title I schools that their schools' student data privacy policies were "very easy" or "easy" to implement in their classrooms (80 percent vs. 74 percent, respectively). Conversely, teachers in non-Title I schools reported more often than teachers in Title I schools that their schools' student data privacy policies were "very difficult" or "difficult" to implement in their classrooms (7 percent vs. 3 percent, respectively).

## EdTech Professional Development Experiences

Approximately nine out of 10 teachers (87 percent) participated in school- or district-provided professional development (PD) during the last school year to support their classroom technology use. Considering only the teachers who received such PD, teachers spent 14.3 hours on average in school- or district-provided PD to support their classroom technology use in the last school year. Across all teachers, including those who did not participate in any such PD, teachers spent 12.5 hours on average in school- or district-provided PD to support their classroom technology use in the last school year. However, as shown in Figure 34, very few teachers participated in sustained training experiences of 21 or more hours. More than half of teachers participated in quick trainings that consisted of less than 10 hours (56 percent).

Teachers of K–2 were less likely than high school or grade 3–5 teachers to have participated in technology-related PD provided by their school or district. Approximately 18 percent of K–2 teachers did not participate in PD to support their use of educational technology, compared to 9 percent of high school teachers and 11 percent of grade 3–5 teachers. Furthermore, high school teachers were more likely than teachers of K–2 to report that they participated in at least 21 hours of such PD, with 18 percent of high school teachers reporting 21 or more hours compared to 11 percent of teachers of K–2.

**FIGURE 34. Teachers who participated in school- or district-provided PD to support their use of technology, by number of hours spent in the last year**



| None | 1–5 | 6–10 | 11–15 | 16–20 | 21+ |
|------|-----|------|-------|-------|-----|
| 13%  | 35% | 21%  | 6%    | 10%   | 15% |
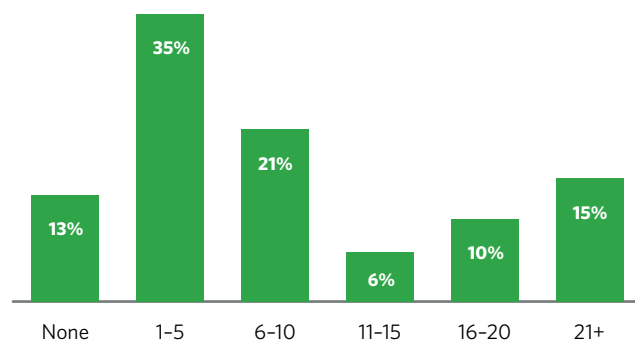
Private school teachers were also less likely than public school teachers to have participated in PD to support educational technology use, with 25 percent of private school teachers reporting that they participated in zero hours of such PD, compared to 11 percent of public school teachers.

The most common topics covered in school- or district-provided technology-related PD were "using educational games with instruction" and "using technology for formative assessment and/or to differentiate instruction," which approximately half of teachers who received such PD reported learning about (Figure 36).

Four out of 10 teachers considered the PD they received to be "very" or "extremely" effective while approximately one out of 10 considered it to be "slightly" effective, and only a very small number considered it "not at all" effective (3 percent) (Figure 35).

Teachers in schools with diverse student populations composed of at least 26 percent students of color and white students were more likely to consider the PD they received as "very" or "extremely" effective, as compared to teachers in schools with predominantly students of color (38 percent of teachers in schools with predominantly students of color vs. 46 percent of teachers in schools with at least 26 percent students of color and less than 75 percent white students).

Teachers of K–2 were more likely than middle school or high school teachers to rate the PD they received as "extremely," "very," or "moderately" effective (92 percent of K–2 teachers vs. 86 percent and 84 percent of middle school and high school teachers, respectively).

**FIGURE 35. Among teachers who participated in PD in the last year, their ratings of the level of effectiveness of technology-related PD received**



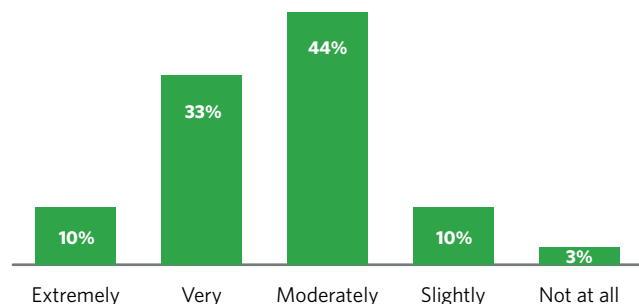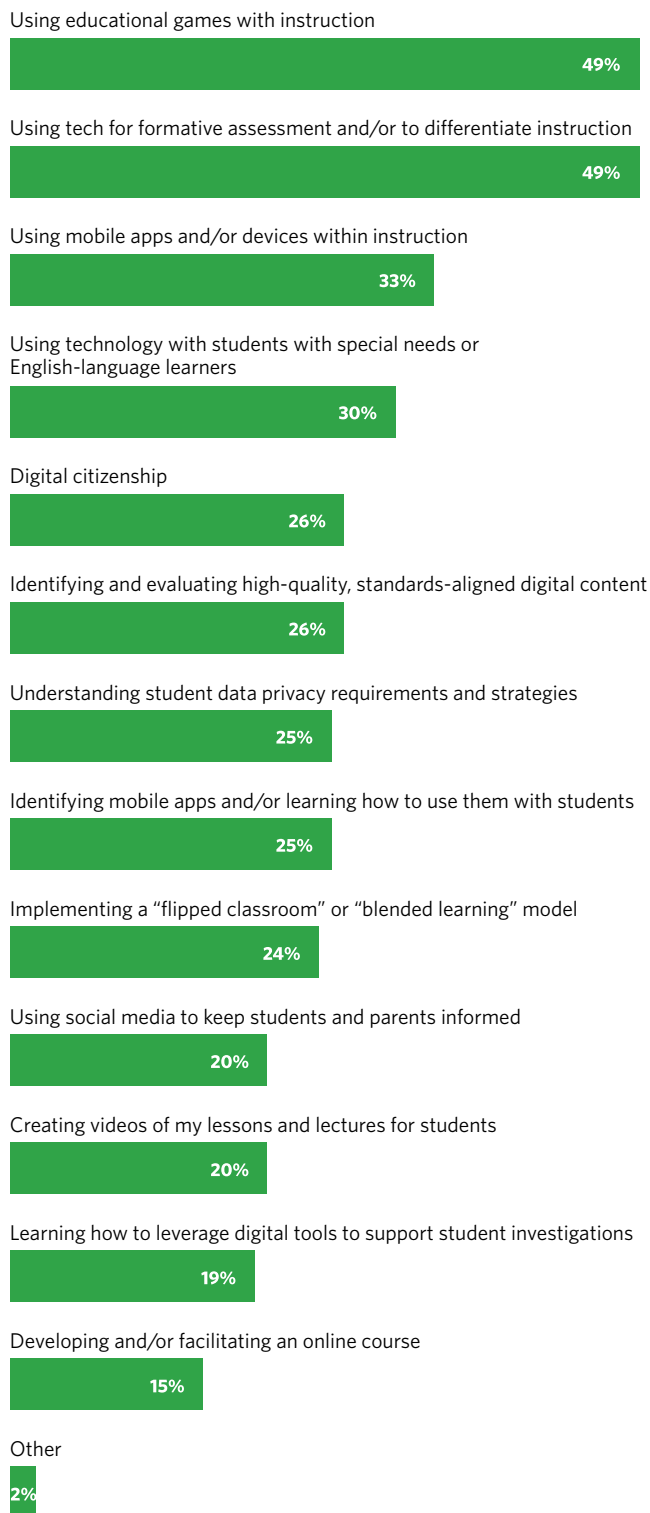| Extremely | Very | Moderately | Slightly | Not at all |
|-----------|------|------------|----------|------------|
| 10% | 33% | 44% | 10% | 3% |

**FIGURE 36. Among teachers who participated in school- or district-provided PD in the last year, topics covered to support their use of educational technology**



Using educational games with instruction — 49%

Using tech for formative assessment and/or to differentiate instruction — 49%

Using mobile apps and/or devices within instruction — 33%

Using technology with students with special needs or English-language learners — 30%

Digital citizenship — 26%

Identifying and evaluating high-quality, standards-aligned digital content — 26%

Understanding student data privacy requirements and strategies — 25%

Identifying mobile apps and/or learning how to use them with students — 25%

Implementing a "flipped classroom" or "blended learning" model — 24%

Using social media to keep students and parents informed — 20%

Creating videos of my lessons and lectures for students — 20%

Learning how to leverage digital tools to support student investigations — 19%

Developing and/or facilitating an online course — 15%

Other — 2%

## Digital Citizenship Policies: Correlations with Teaching Digital Citizenship

As described above, approximately half of teachers (48 percent) said their schools implemented digital citizenship policies, three out of 10 (28 percent) said their schools did not implement, and two out of 10 (23 percent) were not sure.

Teachers in schools with digital citizenship policies were more likely to teach digital citizenship competencies and to use digital citizenship curricula. Teachers in schools with digital citizenship policies taught 2.85 digital citizenship competencies on average, compared to teachers in schools without policies, who taught 1.85 competencies on average. Furthermore, teachers in schools with digital citizenship policies were less likely to say that they did not teach any of the digital citizenship competencies identified in the survey. Among teachers in schools without digital citizenship policies, 32 percent of teachers did not teach any of the digital citizenship competencies identified in the survey, compared to 16 percent of teachers in schools with digital citizenship policies who said the same. Similarly, among teachers in schools without digital citizenship policies, 56 percent of teachers did not use any of the digital citizenship curricula or resources identified in the survey, compared to 23 percent of teachers in schools with digital citizenship policies who said the same.

Teachers in schools with digital citizenship policies were more likely to view the digital citizenship curricula or resources they used as effective. In schools with digital citizenship policies, 55 percent of teachers rated the digital citizenship curricula or resources they used as "very" or "extremely" effective, compared to 49 percent of teachers in schools without digital citizenship policies who said the same.

Teachers in schools with digital citizenship policies were more likely to report that their schools "frequently" or "very frequently" intervened in digital incidents involving students that occurred in off-school hours (25 percent), as compared to teachers in schools without digital citizenship policies (18 percent). Teachers in schools with digital citizenship policies also were more likely to report that "parents or caregivers of students in my class frequently or very frequently post supportive messages about me or the administration online" (19 percent), as compared to teachers in schools without digital citizenship policies (13 percent). There were no other differences in teachers' observations of the technology-related concerns queried in the present survey according to whether teachers' schools implemented digital citizenship policies.
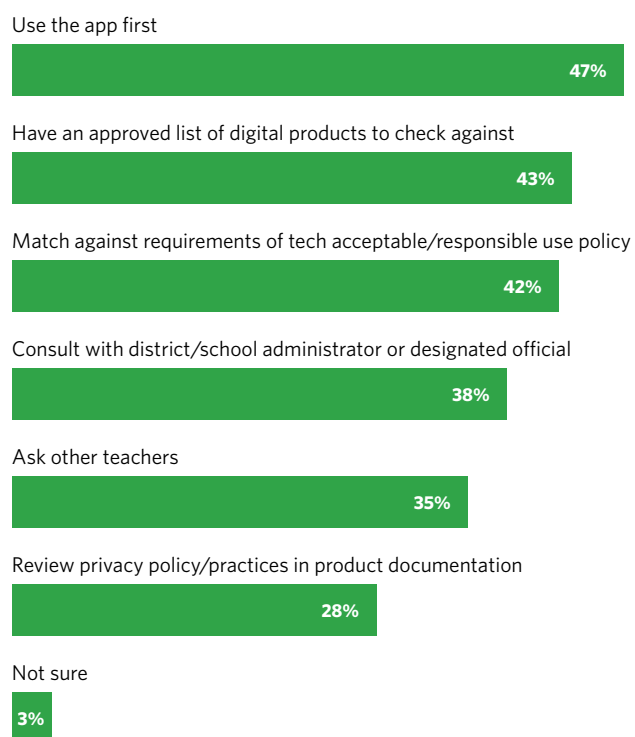
As discussed above, 22 percent of U.S. K–12 teachers learned about digital citizenship in their school- or district-provided professional development (26 percent of the 87 percent of teachers who participated in school- or district-provided PD related to educational technology). Teachers in schools with digital citizenship policies were more likely to participate in PD that covered digital citizenship. Among teachers who participated in PD related to educational technology, 40 percent of teachers in schools with digital citizenship policies learned about digital citizenship, compared to 14 percent of teachers in schools without digital citizenship policies.

## Decisions to Use EdTech Products and Perceptions of District-Procured Technology

Teachers were asked to indicate strategies they used to determine whether a digital product was safe and secure to use with their students and were provided with six possible strategies, for which they could select "All that apply" and options of "I'm not sure how to determine if a digital product is safe and/or secure to use with my students" and "Not applicable or not a factor."

On average, teachers indicated that the most popular strategies were: 1). using the digital product prior to using it with students, and 2). checking the product against an approved list (Figure 37).

**FIGURE 37. Strategies teachers use to determine whether digital products are safe to use with students**

| Strategy | Percent |
|---|---|
| Use the app first | 47% |
| Have an approved list of digital products to check against | 43% |
| Match against requirements of tech acceptable/responsible use policy | 42% |
| Consult with district/school administrator or designated official | 38% |
| Ask other teachers | 35% |
| Review privacy policy/practices in product documentation | 28% |
| Not sure | 3% |

Approximately six out of 10 teachers (62 percent) used two or more types of strategies to determine whether digital products were secure and safe to use with their students. Approximately three out of 10 teachers used only one strategy to determine the safety and security of digital products (29 percent), and very few teachers felt unsure about how to determine the safety and security of digital products for use in their classrooms (3 percent).

Elementary school teachers were more likely than middle school teachers to use an approved list to check digital products' safety; forty-seven percent of K–5 teachers selected this strategy, compared to 37 percent of grade 6–8 teachers. Public school teachers also were more likely than private school teachers to check digital products against an approved list (45 percent of public school teachers vs. 30 percent of private school teachers). Private schools and middle schools may be less likely than public schools and schools of other grade levels to have approved lists for safe and secure digital products

Teachers in Title I schools were more likely to say that they used the digital tool first as compared to teachers in non-Title I schools (50 percent of teachers in Title I schools vs. 43 percent of teachers in non-Title I schools). In addition, teachers with less experience were more likely than those with more experience to try the digital product first to determine whether it was safe and secure for use with students (54 percent of teachers with 10 or fewer years of teaching experience tried the digital product first, compared to 40 percent of teachers with 11 or more years of teaching experience).

Eight out of 10 teachers reported that they made the decision about whether or not to use digital products in their classrooms (Figure 38). Teachers of grades 6–12 were more likely than elementary school teachers to say that they decide whether or not to use educational applications and/or services in their classrooms (84 percent of teachers of grades 6–12 vs. 75 percent of teachers of grades K–5). Among the teachers who make such decisions, the overwhelming majority (84 percent) said that the privacy policy or practices were "extremely" or "very" important in their decisions to use educational applications or services in their classrooms (Figure 39). Although most teachers must consult school or district policies to determine which digital products they can use in their classrooms, teachers also appear to have autonomy over whether they use such products in their classrooms at all. Approximately two-thirds of teachers (63 percent) reported that they either checked the technology acceptable/responsible use policy and/or an approved list of digital products provided by their schools or districts to determine whether the digital product was safe and/or secure for use in their classrooms.

**FIGURE 38. Teachers who make the decision on whether or not to use educational applications and/or services in their classrooms**
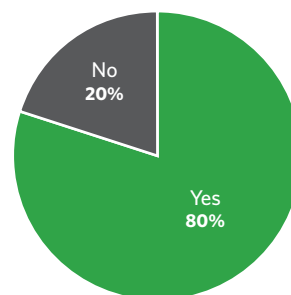


Although most teachers must consult school or district policies to determine which digital products they can use in their classrooms, teachers appear to have autonomy over whether they use such products in their classrooms at all.

**FIGURE 39. Teachers' ratings of the level of importance of the privacy policy in their decision to use applications or services in their classrooms**
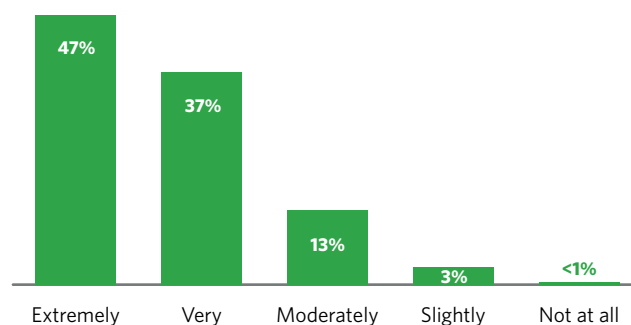
Teachers were also asked, "Has your school or district purchased or provided you with any digital products or devices that you practically never use, or have decided not to use in your classroom?" Roughly a third of teachers said yes, a third said no, and roughly a third said it's possible because they thought that they would not necessarily know if they weren't using such products (Figure 40).

Teachers in public schools were more likely than teachers in private schools to say they did not use digital products provided by their schools or districts (37 percent of public school teachers vs. 26 percent of private school teachers). In addition, teachers with five or fewer years of teaching experience were more likely than teachers with 11 or more years of experience to say that they did not use the technology provided by their schools or districts (43 percent of teachers with one to five years of teaching experience vs. 33 percent of teachers with 11 or more years of teaching experience).

Among teachers who reported not using a digital product provided by their district or school, the top reason these teachers gave was that the product was not relevant to their students' learning needs, reported by 39 percent of these teachers. The second and third reasons for not using a school- or district-provided digital product were that the product was not effective for engaging students (29 percent) or for supporting students' knowledge or skills (23 percent). Reasons that teachers provided for not using school- or district-provided digital products are listed in Table 4. Teachers in suburban schools were more likely than teachers in rural or urban schools to say that they had not used a digital product provided by their school or district due to the product being "not relevant to my students' learning needs" (46 percent vs. 31 percent and 34 percent, respectively). Teachers of grades 3–5 were more likely than teachers of grades 6–12 to say that they had not used a school- or district-provided digital product due to it being "not effective for engaging students" (39 percent of grade 3–5 teachers vs. 25 percent of grade 6–12 teachers). Furthermore, teachers with one to five years of teaching experience were more likely than teachers with 21 or more years of teaching experience to say that they did not use a school- or district-provided product in their classrooms because the digital product was "not effective for engaging students" (35 percent vs. 21 percent, respectively).

**FIGURE 40. Teachers' usage of school- or district-provided educational technology**

Has your school or district provided you with any digital products or devices that you practically never use, or have decided not to use in your classroom?
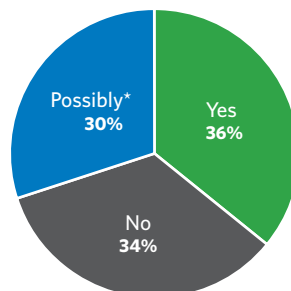


*"It's possible that my district provides digital products or devices that I never use because I might not know such products or devices exist."

**TABLE 4. Teachers' reasons for not using digital product(s) or device(s) provided by their schools or districts**

| Percentage of teachers who thought the product was … | |
| --- | --- |
| Not relevant to students' learning needs | 39% |
| Not effective for engaging students | 29% |
| Not effective for supporting students' skills/knowledge | 23% |
| Too hard to use | 19% |
| Too slow and/or unreliable | 18% |
| Out of date | 16% |
| Other (net) | 17% |

Although a third of teachers said they "might not know if there was a digital product available to them that they were not using," teachers generally agreed that their schools or districts communicated with them at least "moderately" well about opportunities to use digital products or devices in their classrooms (Figure 41). Only a quarter of teachers felt their schools or districts communicated only "slightly" or "not at all" well about opportunities to use digital products or devices in their classrooms.

When considering only the teachers who said they were unsure whether they were not using school- or district-provided digital products that were available to them, the percentage of teachers who felt their schools or districts communicated "slightly" or "not at all" well increased only nominally (29 percent). Thus, poor school or district communication does not appear to be a major reason that approximately a third of teachers said they were not sure whether they were not using technology products that were available to them.

Teachers were also asked open-ended questions about what they liked and did not like about the technology their schools or districts had selected. Teachers most often commented that they liked the educational value of the technology that their schools or districts selected (44 percent of teachers) and commented that the technology was interesting and engaging for students (9 percent of teachers), benefited students' learning (9 percent of teachers), and was appropriate to students' learning level and suited students' needs (7 percent of teachers). Teachers also liked the convenience of the technology their schools or districts selected (20 percent of teachers), commenting that they liked the technology because it was easy to use and navigate or user-friendly (13 percent of teachers), was easily accessible to students and teachers (3 percent of teachers), and/or simplified teaching and learning (2 percent of teachers). Teachers also appreciated having good availability and sufficient access to equipment and technology (12 percent of teachers) and having many options and variety in the technology their schools or districts had selected (7 percent of teachers). Teachers also named a variety of specific software programs, apps, and devices that they liked (16 percent).

**FIGURE 41. Teachers' ratings of how well their school or district communicates about educational technology available for classroom use**
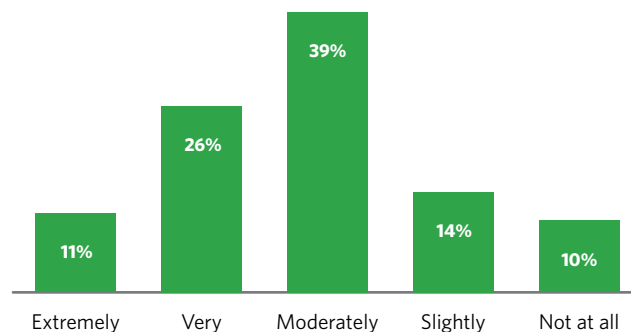


Teachers disliked the technology their schools or districts had selected because of technology-related issues such as insufficient access to equipment (13 percent of teachers), old or outdated equipment (12 percent), technology being hard or difficult to use (8 percent), unreliable technology that broke down or didn't work (6 percent), no training or not enough training (5 percent), technology being too slow (4 percent), and having too little time for time-consuming technology (4 percent). Teachers also said they didn't like technology their schools or districts selected because it didn't meet students' learning needs or levels or didn't apply to their subjects or curricula (11 percent).

IT'S CLEAR THAT MANY educators see educational technology as an integral and useful part of their pedagogical toolkits. Classroom access to technology is nearly universal, and teachers rank many kinds of products as effective in engaging students and in supporting 21st-century learning. However, with the nature of the classroom changing, we think it's worth noting the following observations:

**1.** *The increasing frequency of technology-related issues reported by teachers of the upper grade levels underscores the importance of teaching digital citizenship at secondary grade levels.* It also suggests a need for more study of teachers' practices and needs for curricula or other pedagogical supports in this area. As 1-to-1 access increases with grade level, students' digital citizenship competencies are more likely to be performed in the classroom, providing additional opportunities for issues related to learners' safety and well-being to surface.

**2.** *Nearly all K–12 teachers use a variety of digital tools with students in their classrooms.* Teachers considered most digital tools to be effective for engaging students in learning but were in more disagreement about which tools were effective for developing 21st-century skills and subject-specific content knowledge and skills. Of the ones asked about, productivity and presentation tools, learning management systems, and digital creation tools were rated as more effective than other types of digital tools for developing students' 21st-century skills. Perhaps because teachers viewed many tools as effective for engaging students in learning, teachers across subjects frequently used many types of digital tools that they rated as relatively less effective for developing subject-specific content knowledge and skills. This mismatch may result in a waste of resources—namely, teachers' and students' time, district funds, ill-targeted professional development, and a general lack of efficiency in using digital tools for students' learning.

**3.** *Inequity in access to the internet and computing devices for classroom learning appears more in students' home access than in their classroom access.* Teachers in Title I schools and in schools in which students of color comprised more than 75 percent of the student population were more likely to report that their students lacked adequate home access to broadband internet and computing devices. Teachers in Title I schools were less likely to assign homework requiring home access to the internet or a computer, and many teachers felt that lack of access to technology for learning at home limited their students' learning.

Additionally, most K–12 teachers agreed that technology made it easier to communicate with parents, and most communicated with parents at least a few times a year about their students' use of technology for school purposes. However, in schools serving predominantly students of color, teachers tended to disagree that technology had made it easier to communicate with parents. Communicating and forming relationships with students' families is an important strategy for K–12 teachers to seek guidance and support in helping youth reach their educational goals and potentials.

This finding further suggests that inequities in technology access for learning tend to occur with students' and families' access to technology outside of school. Models showing how schools and teachers that serve predominantly students of color overcome technology barriers to communicate with parents could potentially be valuable for addressing this type of inequity. In addition, teachers seeking to incorporate technology into their students' learning at home and outside of school will need special guidance to support families who have limited access to and fluency with technology.

**4.** *Professional development to support teachers' use of educational technology is quite prevalent.* Nine out of 10 teachers participated in an average of 14 hours of professional development that covered issues such as integrating digital games into instruction and formative assessment. However, only 40 percent of teachers felt that the PD they received to support their use of educational technology was effective. The results suggest there is room for improvement in terms of the quality of the professional development that schools and districts provide to support teachers' technology implementation. Schools and districts might benefit from conducting needs assessments with their teachers to understand the optimal amount of training time and issues in technology integration that teachers are most interested in.

**5.** *High school teachers' most frequently observed concerns were related to digital technology, including some of the more serious safety issues, such as cyberbullying and hate speech.* These data suggest that there is perhaps greater need for high schools to address technology-related concerns with cellphone policies, digital citizenship policies, and social media policies, but schools likely need more support and models for successfully implementing these types of policies.

**6.** *The correlational data showed that schools that implemented digital citizenship policies were more likely to teach digital citizenship competencies, to learn about digital citizenship in their school- or district-provided PD, and to view the digital citizenship curricula that they used as effective.* Teachers in schools with digital citizenship policies were also more likely to report that their schools intervened in digital incidents involving students outside of school and that parents were more likely to post supportive messages about them or the administration online. Future research involving longitudinal correlational data can better address the question of whether digital citizenship curricula and/or policies are helping schools mitigate technology-related concerns that are prevalent at their schools. Successful models of digital citizenship policies and instruction in elementary, middle, and high school contexts would likely be of interest to the many schools that are already implementing digital citizenship or related policies with difficulty (e.g., cellphone and social media policies) and to the schools that are observing unsafe and concerning behaviors related to technology (e.g., cyberbullying, online hate speech, students unable to critically evaluate online information, etc.).

**7.** *The data confirm that teachers make important decisions about the technology they use in their classrooms.* The majority of teachers do consider their students' privacy, safety, and security in their decisions about what technology to use in their classrooms. But approximately a third of teachers have abandoned school- or district-provided technology that they felt was ineffective, irrelevant, or not engaging for their students, unreliable, or hard to use. This is wasteful on many levels and should lend itself to better communication between teachers and their schools or districts about what is needed in the classroom.

While this report addresses many topics of importance related to 21st-century classrooms, there is far more to learn about the state of the modern classroom. For example, our understanding of what works and what doesn't would be immeasurably improved by longitudinal, wide-scale evaluations examining the effectiveness of different technologies, products, curricula, and teaching strategies. However, understanding in-classroom teachers' perspectives on edtech is critical. This report provides valuable and actionable information for educators, administrators, policymakers, and other stakeholders to design equitable educational experiences that prepare all students for a successful future in the digital age.

**National Survey Instrument**

The full Educator Census Survey Instrument can be viewed at: www.commonsensemedia.org/educator-census-survey-instrument.

The survey included questions about the following research topics:

- Teacher and school characteristics

- Digital citizenship practices
  (teaching curricula and competencies, perception of curricula efficacy)

- Assistive technology

- Types of digital tools used by teachers with students in their classrooms (frequency)

- Teachers' decisions to use digital products in the classroom

- Teachers' perceptions of technology their schools or districts selected

- Teachers' awareness of educational technology policies at their schools and perceptions of the difficulty of implementation
  of these policies in their classrooms

- Teachers' perceptions of the efficacy of digital tool types that they used with students in their classrooms
  (for increasing student engagement, content knowledge and/or skills in subject-specific areas, and 21st-century skills)

- Classroom access to technology for learning in the classroom and at home

- Teachers' experiences with professional development to support educational technology use

- Parent and teacher communication about educational technology

In response to the question, "Thinking about the policies at your school to address educational technology, does your school implement any of the following types of policies to address students' use of educational technology?," approximately four out of 10 teachers (37 percent) indicated "other policy addressing educational technology at my school" and wrote in a response. Table A1 (see page 49) presents a summary of the qualitative responses, followed by the number and percentage of teachers who responded with each type among teachers who responded "other."

**TABLE A1. Write-in responses of "other" technology policies that teachers reported their schools implement**

| Percentage of teachers … | |
| --- | --- |
| Other: Other policy addressing educational technology at my school | 20.4%* |
| Other: Technology acceptable/responsible use policy | 6.3% |
| Acceptable websites/apps/website blockers/filters | 5.5% |
| Parental permission/consent/parent user agreement | 4.2% |
| Student contracts/code of conduct/user agreements | 3.6% |
| Safe usage/cybercrime/cybersecurity | 3.5% |
| Other: Social media policy/guidelines | 3.4% |
| Anti-bullying/anti-cyberbullying | 2.9% |
| General use/terms of use/appropriate use | 2.4% |
| Computer/internet usage policies | 1.8% |
| Students are assigned a device/iPad/Chromebook | 1.6% |
| Other: Cellphone policy | 1.6% |
| Supervision/monitoring | 1.5% |
| Student handbook/policy/rules found in handbook | 1.3% |
| District policies | 1.3% |
| Educational sites/apps only | 1.2% |
| Varies/various | 1.1% |
| Use of school technology/devices at home | 1.0% |
| Teacher user agreement/staff policy | 1.0% |
| Common sense | 1.0% |
| Homework/grades | 0.9% |
| Other: Technology purchasing policy | 0.9% |
| iPad/electronics usage policy | 0.8% |
| Time limits/screen time | 0.7% |
| Training | 0.6% |
| Personal use | 0.6% |
| Parental permission for student to be photographed/image used | 0.6% |
| Communication/communication with parents/students | 0.4% |
| Communication/communication with parents/students | 0.4% |
| Other: Student data privacy policy | 0.4% |
| Other: Digital citizenship policies | 0.2% |
| Nothing | 19.8% |
| Don't know | 11.3% |

*Those who responded "other" to the survey item ($n$ = 441, or 37% of K–12 sample)

## About Common Sense

Common Sense is the nation's leading nonprofit organization dedicated to improving the lives of kids and families by providing the trustworthy information, education, and independent voice they need to thrive in the 21st century. Our independent research is designed to provide parents, educators, health organizations, and policymakers with reliable, independent data on children's use of media and technology and the impact it has on their physical, emotional, social, and intellectual development. For more information, visit **www.commonsense.org/research**.

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