

Maine Learning Technology Initiative 2.0 2022–23 Evaluation Report

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Executive Summary

The Maine Department of Education's Office of Innovation launched the Maine Learning Technology Initiative 2.0 (MLTI 2.0) in July 2021. The program seeks to “close Maine’s digital learning gap by creating, developing, and continuously improving the redesigned program’s inter-related dependent components into supports, measures, services and activities that build a foundation of a State and local partnership focused on the equitable integration of technology into engaging and effective educational experiences” (MLTI Advisory Board, 2020, p. 5). The program’s components include 1:1 devices for students and educators, professional learning, and infrastructure support. The MLTI 2.0 initiative builds on the original MLTI plan developed in 2001 to deploy 1:1 devices, provide broadband services, and offer professional learning opportunities (Maine Department of Education, n.d.). The Department developed an updated MLTI focusing on equitable access and use of technology to improve student-centered learning practices of critical thinking, collaboration, creativity, and communication skills. The program is designed to prepare students to be innovative leaders in a digital economy and be high-quality, educated, and adaptable members of a global workforce (Maine Department of Education, 2020). The MLTI 2.0 initiative has the following three main components:

- Providing 1:1 computing devices beginning with Grades 7 and 8 in Year 1 and adding one grade (either older or younger) in Year 2 and one additional grade in Year 3.
- Providing two state-level digital learning specialists and five MLTI digital ambassadors overseen by the digital learning specialists, who provide high-quality professional learning opportunities in support of digital learning and technology integration.
- Providing a state technology infrastructure specialist to support districts in evaluating existing technology infrastructure and supporting districts’ plans to develop additional programs for students in the technological infrastructure fields.

MLTI 2.0 provides grant funding to any Maine public school that agrees to be in the program. Schools may use funding to provide MLTI-approved devices to students and educators. Two hundred forty-seven schools participated in MLTI 2.0 in Year 2, July 2022–June 2023, representing 75 percent of public schools in Maine that offer Grades 6 or 9. The Department allocated a total of 14,380 devices for students and 1,570 devices for educators in the summer of 2022, at an estimated cost of \$6,804,675 (or \$427 per device).¹ In Year 3, MLTI 2.0 will expand to one additional grade level (older or younger) beyond the expansion in Year 2. At full implementation in Year 3 (beginning July 2023), the Department expects MLTI 2.0 will serve approximately 56,000 students and 5,700 educators in Grades 5 through 10.

¹ Total allocations were based on the number of students enrolled and staff employed by school, with a 10% buffer in case of enrollment or staffing changes. The Department allocated an additional 152 devices for students and 124 devices for staff in the fall of 2022 to accommodate changes in enrollment and staffing. Source: Administrative data on device allocations provided to AIR by the Department.

During Year 2 of the initiative, the purpose of the evaluation was to provide formative feedback to the Department and other stakeholders, including Maine legislators, members of the MLTI Advisory Board, and district technology leaders, about implementation of the three MLTI 2.0 components, conditions supporting technology integration, and teachers' use of technology for instruction and in support of student-centered learning. The Year 2 evaluation also examined preliminary program outcomes with respect to teacher beliefs and practices related to educational technology.

The American Institutes for Research® (AIR®) collected **extant statewide data** to describe program implementation, and administered **teacher surveys** in a sample of 27 participating schools to describe teachers' participation in professional learning opportunities, use of technology in support of student-centered learning and beliefs about technology. AIR administered **student surveys** (from the same sample of schools) to understand their perspective on opportunities for student-centered learning with technology. AIR also conducted **interviews and focus groups** at eight schools to create school profiles of technology integration supports related to leadership, professional learning, and technology infrastructure.

MLTI continued to largely succeed in its goal of providing devices to students and educators on a one-to-one basis. Nine in 10 schools distributed one device per student, and seven in 10 distributed one device per educator. Moreover, a larger percentage of schools completed distribution early in the 2022-23 school year than in the 2021-22 school year. Also, fewer schools reported issues with the receiving and distributing devices this year than last year. These findings indicate that MLTI 2.0 improved its process for getting devices to schools and that schools were more successful in distributing them early in the school year. The initiative was within 1-3 percentage points of meeting the three milestones for the percentage of schools receiving and distributing student devices on a 1:1 basis, and the percentage distributing student devices early in the year. The initiative was within 11-23 percentage points of meeting these milestones for educators.

Recommendation: Consider establishing a process for determining if there is an unmet need for additional or updated educator devices., and if there is, address it in collaboration with schools where the unmet need exists.

MLTI produced many resources for professional learning opportunities (PLOs), and the survey data suggest that about half of teachers participate in some type of MLTI-developed PLO. MLTI produced 150 online professional learning resources. Of those participants who completed surveys after in-person events or self-paced learning, most agreed that the professional learning opportunity was useful. Data from teachers in the teacher survey sample suggest that about half of the teachers in MLTI schools participated in some type of MLTI-provided professional learning opportunity, and nearly all MLTI schools had at least one teacher that participated in some type of MLTI PLO. Over one quarter of teachers indicated they participated in online events or self-paced online learning, with about 10 percent or fewer indicating they participated in hybrid events or coaching. The initiative exceeded the milestones related to the number of resources developed, percent of schools participating in professional learning opportunities, and percentage of educators agreeing that these opportunities were useful.

There is evidence that schools varied considerably in the extent to which they support professional learning related to technology. Staff in 2 of 8 profiled schools described high levels of professional learning in support of technology integration, characterized by systemic supports for professional learning that is often job embedded (i.e., related to teachers' curricular needs). However, staff in the other 6 schools described infrequent professional learning opportunities that were not typically job embedded. Staff in all 8 schools described medium levels of collaboration, occurring both informally and in more formal structures (e.g., "lunch and learns"). About half of surveyed teachers indicated they encountered barriers to participating in professional learning opportunities, including about a third of surveyed teachers who perceived the lack of relevance and lack of time as barriers to participation.

Recommendation: We would suggest that a major focus of MLTI next year is making the professional learning component stronger for teachers and administrators. MLTI may consider a need-sensing process for identifying professional learning topics in teaching and learning with technology that are in high demand among MLTI schools, and then developing and providing professional learning opportunities focused on those topics. The department may also consider developing a learning management system that will assist in tracking teacher access to professional learning opportunities. Finally, to address the perceived lack of time to participate in professional learning, MLTI may consider ways to help schools and districts incorporate professional learning into existing school routines and structures.

Little evidence was found of school leadership support for technology in profiled schools. We categorized 7 of the 8 profiled schools as having low levels of leadership support. Within this group, staff described either medium or low levels of leadership with respect to promoting a shared vision for technology use, promoting a culture of innovation, and participating in professional learning for technology leadership.

Recommendation: Extend the MLTI approach to professional learning opportunities on teaching and learning with technology to include opportunities for school administrators. For example, MLTI may consider developing a self-paced learning series focused specifically on the knowledge and skills for leading technology integration. MLTI also may consider providing incentives for leaders to participate in these learning opportunities.

Infrastructure support was well received among those schools that participated, but relatively few schools participated. Data from MLTI infrastructure specialist records and logs showed that 14 schools received an IT support site visit, and that 13 schools received IT support through conferences and presentations. All IT staff who participate in these visits reported that they were satisfied or very satisfied with the support provided by the infrastructure specialist. Based on these findings, the initiative met the three program milestones related to number of site visits and presentations conducted by the state infrastructure specialist and the level of satisfaction with these visits. While this met the goals set this year for this program component, this represents few of the overall MLTI schools.

In the majority of profiled schools (5 of 8), staff described high levels of technology infrastructure. This was indicated by dependable wireless connectivity, prompt technical support, and devices with up-to-

date software. In 3 of the 8 schools without high levels of technology infrastructure, school staff noted that technical support was not consistently available, wireless connectivity was not always dependable, and that devices did not always receive timely software updates. Thus, access to technology infrastructure appears to be relatively strong compared to the other two domains of school supports – leadership and professional learning – although it is not consistently high across schools.

Recommendation: The program may consider either expanding the goals for the infrastructure support component of the program to reach a larger number of MLTI schools, or developing a process to focus the current resources on schools where this support is most needed. The variation in the levels of technology infrastructure (indicated by the school profiles) suggests the importance of identifying schools most in need of technology infrastructure support.

Teachers frequently used technology to prepare instruction, manage the classroom, and provide opportunities for student-centered learning. At least three quarters of students indicated that, across all their classes, teachers frequently asked them to use of technology in relation to the skills of communication, collaboration, creativity, and critical thinking. The majority of surveyed teachers used technology on a daily basis for both supporting instruction and classroom management and communication. In addition, around three fifths of surveyed teachers frequently asked students to use technology related to the skills of communication, collaboration, and critical thinking, with slightly less than half reporting frequently asking students to use technology for creativity.

Surveyed teachers reported that the tools they used most frequently are word processing and presentation software, course management, and communication tools. In contrast, about one fifth of teachers used creativity tools at least monthly. Surveyed teachers most frequently mentioned creativity tools when asked which computer applications they would like to use if they had access to them.

Recommendation: Given that a majority of teachers are providing opportunities for students to use technology for student-centered learning, MLTI may consider identifying and publicizing successful uses of technology among teachers. Given that teachers indicated relatively less frequent use of creativity tools and an interest in greater access to these tools, MLTI could explore possibilities for facilitating purchasing of these tools. They may also identify specific professional learning needs related to creativity tools.

Most teachers were confident in their ability to use technology for instruction and believed that technology is useful for instruction. This indicates that a very strong base of support upon which professional learning efforts can build and suggests that these attitudes are (at the very least) not inhibiting teacher implementation of technology integration.

Recommendation: Collect data to test possible explanations for decreases in teacher attitudes towards and use of technology.

Introduction

This report presents findings from the evaluation of Year 2 of the Maine Learning Technology Initiative (MLTI) 2.0. The Maine Department of Education (Maine DOE) has contracted with the American Institutes for Research (AIR) to evaluate the program. This report builds on the findings presented in the Year 1 evaluation report, submitted by AIR to Maine DOE in September 2022. Over 5 years, AIR will evaluate implementation of the major components of MLTI 2.0, along with the outcomes of these components with regard to schools, educators, and students.

History and Goals of the Program

Maine DOE's Office of Innovation launched MLTI 2.0 in July 2021. The program seeks to "close Maine's digital learning gap by creating, developing, and continuously improving the redesigned program's inter-related dependent components into supports, measures, services and activities that build a foundation of a State and local partnership focused on the equitable integration of technology into engaging and effective educational experiences" (MLTI Advisory Board, 2020, p. 5). The program's components include 1:1 devices for students and educators, professional learning, and infrastructure support. MLTI 2.0 builds on the original MLTI plan developed in 2001 to deploy 1:1 devices, provide broadband services, and offer professional learning opportunities (Maine Department of Education, n.d.). Maine DOE developed an updated MLTI focused on equitable access to and use of technology to improve student-centered learning practices for critical thinking, collaboration, creativity, and communication. The program is designed to prepare students to be innovative leaders in a digital economy and educated and adaptable members of a global workforce (Maine Department of Education, 2020).

Summary of Major Components

MLTI 2.0 has three main components.

- **Device access.** MLTI funded the purchase and distribution of 1:1 computing devices for students in Grades 7 and 8 in Year 1, and will add one grade (either older or younger, based on the district's choice) in both Years 2 and 3. The initiative also funds the purchase of devices for educators in these schools. Recognizing that Maine already funds 1:1 computing devices in Grades 7 and 8, the funding in Year 1 allowed schools to update the devices currently available to students in those grades.
- **Professional learning.** The initiative funds two state-level digital learning specialists to oversee five MLTI digital ambassadors, each of whom provides high-quality professional learning in support of digital learning and technology integration. The two digital learning specialists develop and manage execution of the statewide vision for professional learning on the use of technology for teaching and learning. The five digital ambassadors directly connect with educators and provide professional development.
- **Infrastructure support.** The initiative funds a state technology infrastructure specialist to support districts in evaluating existing technology infrastructure and developing career

programs for students in the technology infrastructure field. The technology infrastructure specialist also provides guidance to districts on how to leverage different funding sources to expand their technology infrastructure.

MLTI 2.0 provides grant funding to any Maine public school that agrees to participate in the initiative. Schools may use funding to provide MLTI-approved devices to students and educators. Two hundred forty-seven schools participated in MLTI 2.0 in Year 2 (July 2022–June 2023), representing 75% of public schools in Maine that offer Grades 6–9 (National Center for Educational Statistics, n.d.). Maine DOE allocated a total of 14,380 devices for students and 1,570 devices for educators in the summer of 2022, at an estimated cost of \$6,804,675 (or \$427 per device).² Schools could choose between the Apple MacBook Air, Apple iPad, CTL Convertible Chrome Laptop, Dell Chromebook, Dell Latitude, and WCA Windows HP ProBook. In Year 3, MLTI 2.0 will expand to one additional grade level (older or younger) beyond the Year 2 expansion. At full implementation in Year 3 (beginning in July 2023), Maine DOE expects MLTI 2.0 to serve approximately 56,000 students and 5,700 educators in Grades 5–10.

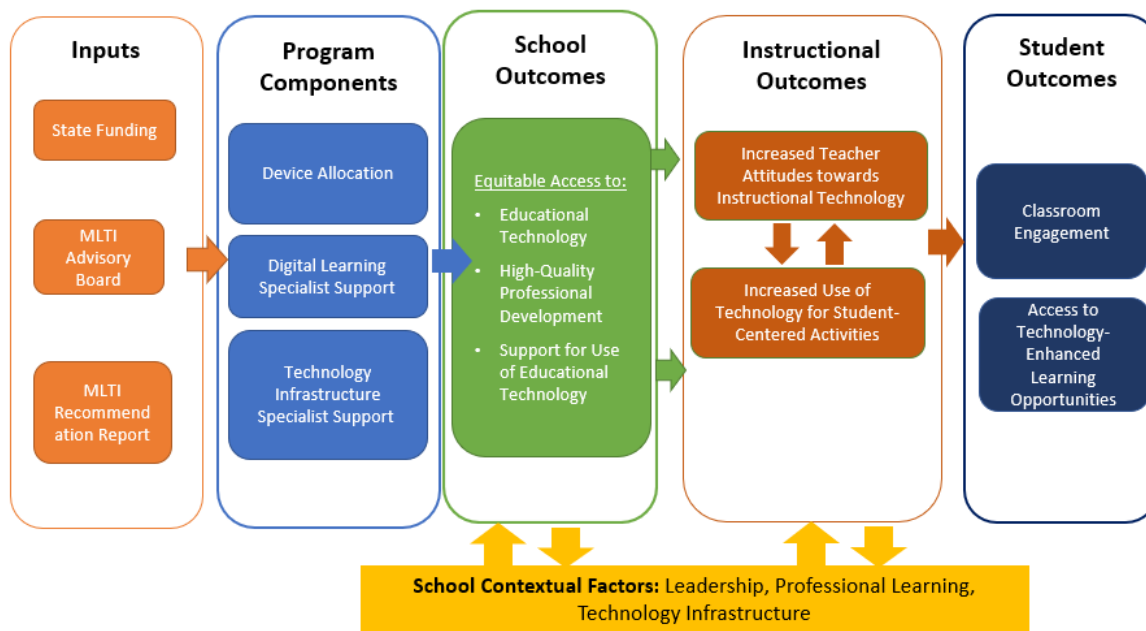
The MLTI 2.0 logic model summarizes the key components of the initiative and their anticipated influence on schools, teachers, and students (Exhibit 1). As depicted in the logic model, the initiative’s components will lead to three school-based outcomes: more equitable access to educational technology, more equitable participation in high-quality professional learning opportunities, and more equitable school-level support for the use of educational technology. Enhancing these school-based outcomes will influence teacher attitudes toward technology and promote more frequent use of technology for student-centered instruction (Argueta et al., 2011; Hur et al., 2016; Liu et al., 2017; Miranda & Russell, 2012; Moeller & Reitzes, 2011; Office of Educational Technology, 2021). The logic model includes school-level factors adapted from the Future Ready Schools framework (Office of Educational Technology, 2016), which are expected to support the integration of technology into instruction. These factors include the following:

- **School leadership** – promoting a shared vision for teaching and learning using technology, along with a culture of trust and innovation
- **Professional learning** – encompassing job-embedded professional development and collaboration in a learning community
- **Technology infrastructure** – including wireless connectivity, network bandwidth, and technical support staff who ensure the reliable use of technology

Maine DOE anticipates that these instructional changes will provide students with increased access to technology-enhanced learning opportunities and foster greater classroom engagement.

² Total allocations were based on the number of students enrolled and the number of staff employed by a school, with a 10% buffer in case of enrollment or staffing changes. Maine DOE allocated an additional 152 devices for students and 124 devices for staff in fall 2022 to accommodate changes in enrollment and staffing. Source: Administrative data on device allocations provided to AIR by Maine DOE.

Exhibit 1. Logic Model for MLTI 2.0



Review of Prior Evaluation Findings

The Year 2 evaluation builds on the findings from Year 1. As we reported last year, MLTI largely succeeded in its goal of providing devices to students and educators on a one-to-one basis during Year 1. Nine in 10 participating schools distributed one device per student, and seven in 10 schools distributed one device per educator. Furthermore, school technology infrastructure appeared to be sufficient for most technology uses, with almost all MLTI schools with available data meeting the criterion for sufficient bandwidth set by Maine DOE. Most teachers reported having access to the programs and software they needed to integrate technology for student-centered learning. Half to two thirds of surveyed teachers asked students to use technology on at least a monthly basis in ways that emphasized the development of communication, collaboration, critical thinking, and creativity skills.

Based on the findings from Year 1, the evaluation team recommended several areas of growth for the initiative. Although nearly all schools received devices on a one-to-one basis, some schools did not distribute devices in the first quarter of the year. With regard to professional learning, most teachers did not participate in MLTI-provided professional learning opportunities; instead, professional learning typically occurred through informal collaboration or teacher-led workshops. Teachers expressed an interest in sustained professional learning on emerging trends in technology and the application of technology to curricular goals. School leaders communicated a general vision for technology use, although there was considerable variation in both the formality of the vision and the extent of communication about the vision. There were also limited opportunities for school administrators to engage in professional learning on school technology leadership.

Evaluation Approach and Questions

Similar to Year 1 of the project, one of the goals of Year 2 was to provide formative feedback to Maine DOE and other stakeholders about how MLTI 2.0 components were implemented, how teachers and students used technology, and what types of supports or resources would be useful. To address these topics, the evaluation team gathered extant data on all participating schools, administered teacher and student surveys to a sample of 27 schools, and conducted focus groups with teachers and interviews with school technology leaders in a sample of eight schools. The Year 2 evaluation addressed the same five process evaluation questions (EQs) as the Year 1 evaluation:

1. To what extent are the key components of MLTI 2.0 implemented as intended? What are the facilitators of and barriers to implementation?
 - a. Annual allocation of 1:1 computing devices?
 - b. Opportunities for professional learning that emphasize student-centered approaches to technology integration?
 - c. Support for district technology infrastructure and technological infrastructure programs?
2. What are stakeholder opinions about the quality and usefulness of these components?
3. To what extent and in what ways are schools establishing conditions that support integration of technology into instruction?
4. To what extent and in what ways are educators using technology to support student-centered learning? What barriers and facilitators have educators encountered?
5. What are promising technology tools or models for supporting student-centered learning?

AIR used extant, statewide data to describe implementation of program components related to device access, MLTI 2.0 professional development, and technology infrastructure support (EQ 1). AIR conducted teacher surveys in a sample of 27 schools to gather feedback about the quality and usefulness of MLTI 2.0 components (EQ 2), the extent to which educators used technology to support student-centered learning (EQ 4), and the technology tools that teachers used to support student-centered learning (EQ 5). AIR also conducted a student survey (in the same 27 schools as the teacher survey) to gather their perspectives on the extent to which educators used technology to support student-centered learning (EQ 4). We conducted interviews and focus groups in eight of the 27 sampled schools to create school profiles that describe three domains of supports for technology integration: school leadership, professional learning, and technology infrastructure (EQ 3). These eight profiled schools were purposively sampled to be the same as in Year 1 of the evaluation, providing a longitudinal view of technology integration in those schools.

Year 2 of the evaluation also addressed three EQs related to program outcomes:³

³ In Year 4, the evaluation will examine a fourth outcome question about changes in student engagement across years.

6. To what extent is MLTI 2.0 associated with a reduction in the digital divide with regard to the following:
 - a) Equitable access to educational technology (e.g., ratio of devices to students, types of devices and software)
 - b) Equitable use of technology for student-centered learning activities
 - c) Equitable access to high-quality professional learning opportunities
 - d) Equitable school-level support for use of educational technology
7. To what extent is participation in MLTI 2.0 associated with increased teacher confidence in technology use and increased belief in the usefulness of classroom technology?
8. To what extent is participation in MLTI 2.0 associated with increased use of technology to support student-centered instruction?

AIR used teacher survey data to measure teachers' use of technology for student-centered learning, access to high-quality professional development, and availability of infrastructure support (EQ 6), as well as teachers' confidence in using technology and beliefs about the usefulness of technology (EQ 7). AIR examined the reduction of the digital divide by collecting extant data, such as program and administrative records, vendor documentation, and publicly available data sets (EQ 6). AIR will submit findings on the digital divide in a separate memo in August 2023.

Report Organization

This report is organized as follows:

- Section 1 describes the evaluation methods including sampling, data collection, measurement, and analysis procedures for all data sources.
- Sections 2–4 address the program's three main components of device access, professional learning, and technology infrastructure support, respectively. Each section addresses both implementation of the component (EQ 1a–c, respectively) and participant reactions to the component (EQ 2).
- Section 5 describes teacher and student use of technology, with regard to the purpose of technology use (EQ 4) and the types of tools used (EQ 5). It also summarizes findings related to the teacher outcomes of MLTI 2.0—namely, whether the program is associated with changes in teacher attitudes towards technology (EQ 7) and instructional practices related to technology (EQ 8).⁴
- Section 6 describes findings related to the conditions supporting technology use (EQ 3).
- Section 7 provides an overall discussion of major findings and recommendations.

⁴ AIR will submit findings on the digital divide (EQ 6) in a separate memo to Maine DOE.

Section 1: Evaluation Methods

The evaluation consisted of descriptive and correlational analysis methods examining several data sources across three major categories: extant program data, survey data, and qualitative interviews or focus groups.

Extant Data Sources

AIR analyzed extant data from Maine DOE to help assess program implementation statewide. The analyses describe access to technology (i.e., whether schools received new devices as intended), access to professional learning opportunities, and support for district technology infrastructure.

Data on access to technology. Maine DOE provided administrative records on device allocation, device purchasing records from vendors, and responses to a Device Deployment Survey administered by Maine DOE to each school. Of the 247 schools participating in MLTI 2.0, 200 schools completed the Device Deployment Survey (an 81% response rate). To examine whether survey responses varied by school characteristics, schools that completed the survey were compared with schools that did not complete the survey on several school-level demographics (i.e., region, locale, school size, and percentage of students eligible for free or reduced-price lunch [FRPL]). None of these characteristics were significantly correlated with school response. Maine DOE also provided administrative records on student enrollment and the number of educators by school and grade level. AIR used these data to describe the number of devices received or distributed per student or educator, the types of devices schools received, and the timing of device distribution.

Data on professional learning opportunities. AIR obtained professional learning session materials to assess the number of professional learning resources produced and provided. AIR also requested logs of professional development provided by the initiative's six digital ambassadors, who provide professional learning opportunities related to digital learning and technology integration. These records were used to assess the percentage of MLTI schools that participated in any MLTI professional development. Additionally, AIR obtained post-event surveys (i.e., surveys administered by MLTI and completed by teachers after in-person and online professional learning activities) to assess teacher perceptions of the usefulness and quality of the professional learning opportunities.

Data on support for district technology infrastructure. Maine DOE provided records (e.g., logs of email communications with the infrastructure specialist, event flyers, agendas) which AIR used to assess the number of infrastructure support events that occurred through MLTI in 2022–23. It also provided administrative records from Networkmaine on school-level contracted network bandwidths. Due to all schools exceeding the threshold (1 gigabyte), an analysis assessing participating schools' bandwidth was not performed for the Year 2 evaluation.

Teacher and Student Survey

Survey Sample

For both the teacher and student survey, AIR used a stratified random sampling approach to select 27 schools across nine superintendent regions, with probability of selection weighted proportionally to the number of schools in each region (i.e., more schools were sampled from regions with more schools overall). Based on statewide distributions, the sample was balanced to have equal representation of schools with low, middle, and high proportions of students eligible for FRPL; to include schools from each quartile of school size; and to include schools from urban, suburban, and rural locales. AIR sampled these schools from the population of 247 schools serving Grades 6–9 that signed the MLTI opt-in agreement. Surveys were collected from teachers in participating grades and their students.

Response rate and nonresponse bias. For the teacher survey, there were 190 respondents out of 505 (estimated) total teachers, for a response rate of 38%. Teachers from 24 of the 27 schools in the sample responded. For the student survey, there were 1,462 respondents out of 3,885 (estimated) total students, for a response rate of 38%. Students from 19 of the 27 schools in the sample responded.

To test for systematic bias in nonresponse, AIR examined whether the proportion of students responding at each school varied by school-level characteristics (i.e., percentage of students eligible for FRPL, percentage of students with disabilities, per-pupil expenditure, number of teachers per school, or region). There were no significant correlations between school-level response rates and any of these school characteristics.

Survey Instruments

Teacher survey. The teacher survey included 70 items (with both Likert-type rating scales and frequency scales) on the following topics:

- Time spent in professional development (three items; Margolin et al., 2019).
- Perceived barriers to professional development (four items; Organisation for Economic Co-operation and Development, 2018).
- Professional learning opportunities teachers would like to access (one open-ended item).
- Types of MLTI professional learning opportunities (four items).
- Frequency of technology use for instruction (10 items; National Center for Education Statistics, 2009). These addressed the subtopics of instructional preparation and delivery (four items) and management and productivity (six items).
- Frequency of technology use to support student-centered learning (19 items; Margolin et al., 2019).
- Frequency of student-centered activities related to the four 21st century skills of collaboration (four items), critical thinking (four items), creativity (five items), and communication (six items).
- Availability of support for technology use (five items; Margolin et al., 2019).
- Frequency of use of specific educational software and tools (16 items). These survey items covered the following seven categories of software and tools: course management, productivity,

communication, programming and analysis, personalized learning, simulations and educational games, and creativity. Each category contained two or three items.

- Educational software and tools to which teachers would like access (one open-ended item).
- Confidence in ability to integrate technology (three items; Gerdeman et al., 2021).
- Value of technology for instruction (four items; Vannatta & Banister, 2009).

Student survey. The student survey contained the same 19 items about the frequency of technology use to support student-centered learning (described above), with some minor changes in wording to align with middle school students' reading level.⁵

Composition of Survey Measures

AIR aggregated item-level survey responses into scale scores corresponding to different topics. We conducted psychometric analyses using the Rasch model to determine if these sets of items formed reliable and coherent scales. The followings sets of items demonstrated evidence that they could be treated as single-factor scales:

- Frequency of technology use for instructional preparation and delivery (four items; teacher survey)
- Frequency of technology use for management and productivity (six items; teacher survey)
- Availability of support for technology use (five items; teacher survey)
- Confidence in ability to integrate technology (three items; teacher survey)
- Value of using technology for instruction (four items; teacher survey)
- Student engagement (five items; student survey)

For these items, the study team used the Rasch model to predict a single scale score representing teachers' response across all items. We then transformed the score to correspond with the response category in the original response scale (i.e., Strongly Agree, Agree, Disagree, Strongly Disagree) where the scale score had the highest probability of being observed (Wright & Masters, 1982).⁶

For sets of items that did not show evidence supporting scaling using the Rasch model, we categorized teachers and students based on whether their responses to items in the set exceeded a certain threshold. For each of the four sets of items related to frequency of technology use with regard to 21st century skills, we categorized the responses of teachers and students who responded to two or more items as follows: Daily or Almost Daily, Weekly, or Monthly. As described above, these four topics each comprised four to six items.

We used a similar approach to categorize teachers based on how frequently they used seven categories of educational software and tools. All of these categories had either two or three items, and we counted teachers as frequent users of that category of tool or software if their rating for at least one of the items in that category was Monthly or More Frequent.

⁵ The student survey contained five additional items on student engagement that were not included for analysis this year.

⁶ Additional methodological details and results from these psychometric analyses are available upon request.

Analytic Methods for Examining Change in MLTI 2.0 Outcomes

AIR examined change in teacher outcomes using the mean overall Rasch scale scores for the following three constructs from the teacher survey: frequency of technology use for student-centered activities, confidence in ability to integrate technology, and belief in the usefulness of technology. We analyzed teacher survey data for all sampled schools in Year 1 and Year 2, and we drew a new sample of schools in Year 2 that partially overlapped with the sample from Year 1. We estimated changes in scores using a linear regression analysis comparing mean scores in Year 2 with the same measures in Year 1, nested within region to account for potential similarities in teacher responses in schools in similar areas of the state. School-level covariates aggregated to the regional level were also included to control for differences associated with regional characteristics (i.e., percentage of students eligible for FRPL, total number of students, and rurality).⁷

For descriptive purposes, we categorized each teacher based on their typical response to the response scale across the individual items comprising the scale. We then used response frequencies to illustrate differences in the distribution of responses across years.

School Profile Data Sources and Methods

We created profiles based on interviews and focus groups with staff at eight schools. The aim was to understand how school staff perceive their schools' leadership, professional learning, and technology infrastructure as supports for integrating technology.

Sampling. We sampled eight schools from a list of all Maine public schools that participated in MLTI. We balanced the sample to have roughly proportional representation of schools based on statewide distributions by locale and by percentage of students from low-income families, and to include schools from eight of nine different superintendent regions. One school in our original sample did not respond to our request for participation. To find an alternate eighth school, the MLTI team reached out to schools they had worked with in the past (with similar characteristics to the nonresponsive school) and identified a school that was willing to participate in the evaluation.

Data collection. The research team conducted virtual video interviews with each school's designated school technology leader, as well as virtual video focus groups with teachers. In total, AIR conducted eight technology leader interviews and four teacher focus groups. Teachers at four schools did not agree to participate in teacher focus groups.

Analysis framework. AIR developed a technology integration support framework to guide interview and focus group protocol development and qualitative data collection and analysis. This framework describes three major domains of school-level processes that prior research indicates are critical for supporting technology integration: technology infrastructure, leadership for technology integration, and professional learning for technology integration. These domains correspond to the Future Ready Schools framework (Office of Educational Technology, 2016) and reflect the MLTI 2.0 logic model. Further details about the framework and qualitative analysis appear in Section 5.

⁷ Additional methodological details and results from these analyses are available upon request.

Section 2. Device Allocation and Distribution

This section addresses the extent to which MLTI implemented one-to-one allocation of devices for students and educators, as well as the timing of device receipt and distribution. These analyses used data from a Device Deployment Survey distributed by MLTI. A total of 201 MLTI 2.0 schools out of 247 completed the Device Deployment Survey and reported receiving a total of 14,380 devices for students and 1,570 devices for educators.

These analyses also provided information on the extent to which MLTI 2.0 accomplished the following three program implementation milestones related to the program component of access to technology:

- MLTI schools receive 1:1 devices for students and educators (criterion: 95% of schools).
- MLTI schools distribute 1:1 devices to students and staff (criterion: 95% of schools).
- MLTI schools distribute devices by October 1 (criterion: 90% of schools).

Overall, most schools received and distributed student devices on a one-to-one basis (94% and 93%, respectively), and most schools that received educator devices (84%) distributed those devices on a one-to-one basis. With regard to timing, most schools had finished receiving student devices by August 2022 and distributing them by September 2022 (85% and 87%, respectively). About three in four schools finished receiving educator devices by August 2022 and distributing them by September 2022 (73% and 75%, respectively).

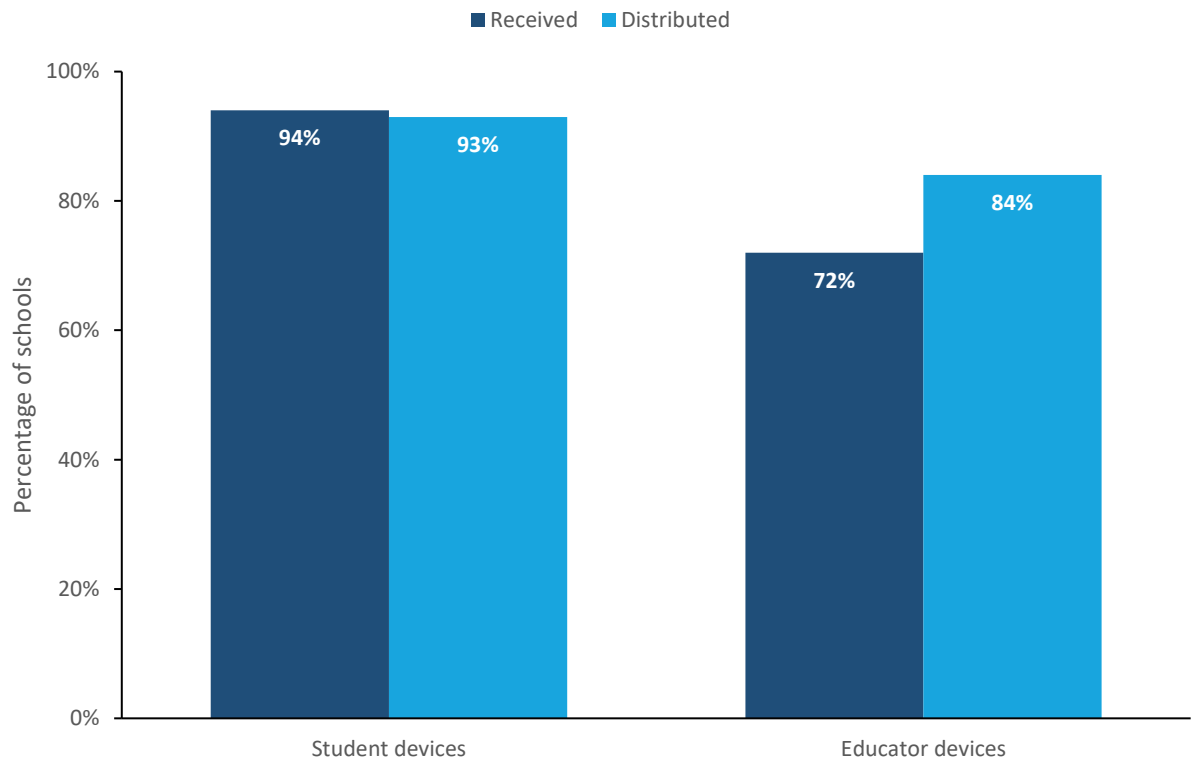
Receipt and Distribution of 1:1 Devices for Students and Educators

Most schools received (94%) and distributed (93%) student devices on a one-to-one basis (Exhibit 2). Completion of device distribution was defined as a school reporting that it had distributed all the devices it received. These percentages were just below the 95% criterion for program implementation established by Maine DOE. In comparison with the previous year, the percentage of schools that distributed 1:1 devices for students increased from 89% in 2021–22 to 93% in 2022–23.

The percentage of schools with 1:1 devices for educators was lower than the percentage of schools with 1:1 devices for students. Seventy-two percent of schools reported receiving educator devices on a one-to-one basis. Among the schools that reported receiving educator devices, most (84%) reported distributing approximately one device per educator (Exhibit 2). The lower percentage for educator devices primarily reflects the fact that some schools with device allocations for educators reported never receiving devices. In comparison with the previous year, the percentage of schools that distributed 1:1 educator devices increased from about three quarters (72%) of schools in 2021–22 to most schools (84%) in 2022–23.

Ratios of devices to students or educators were defined as the number of devices a given school received for students (or educators) in 2022–23 divided by the number of eligible students (or educators) in that school. Due to fluctuations in student and staff counts over the data collection period, we considered ratios greater than or equal to 0.95 to indicate that schools received devices on a one-to-one basis.

Exhibit 2. Percentage of Schools That Received and Distributed 1:1 Devices for Students and Educators



Source: Device Deployment Survey.

Note. Device receipt percentages are in relation to the total number of schools with allocated devices in 2022–23 (student devices $N = 183$; educator devices $N = 145$). Device distribution percentages are in relation to the total number of schools with allocated devices in 2022–23, plus 17 schools only distributing devices received in previous years (student devices, $N = 200$, educator devices, $N = 162$).

Timing of Device Receipt and Distribution

We examined the month in which MLTI schools finished receiving their allocated devices and the month in which they finished distributing them to students and to educators. We considered August 2022 to be the critical month by which to complete device receipt, in order to begin distributing them by the time school started in September 2022. We considered the end of September 2022 (prior to October 1) to be a critical point by which to complete device distribution, to allow students and staff to begin using them early in the school year.

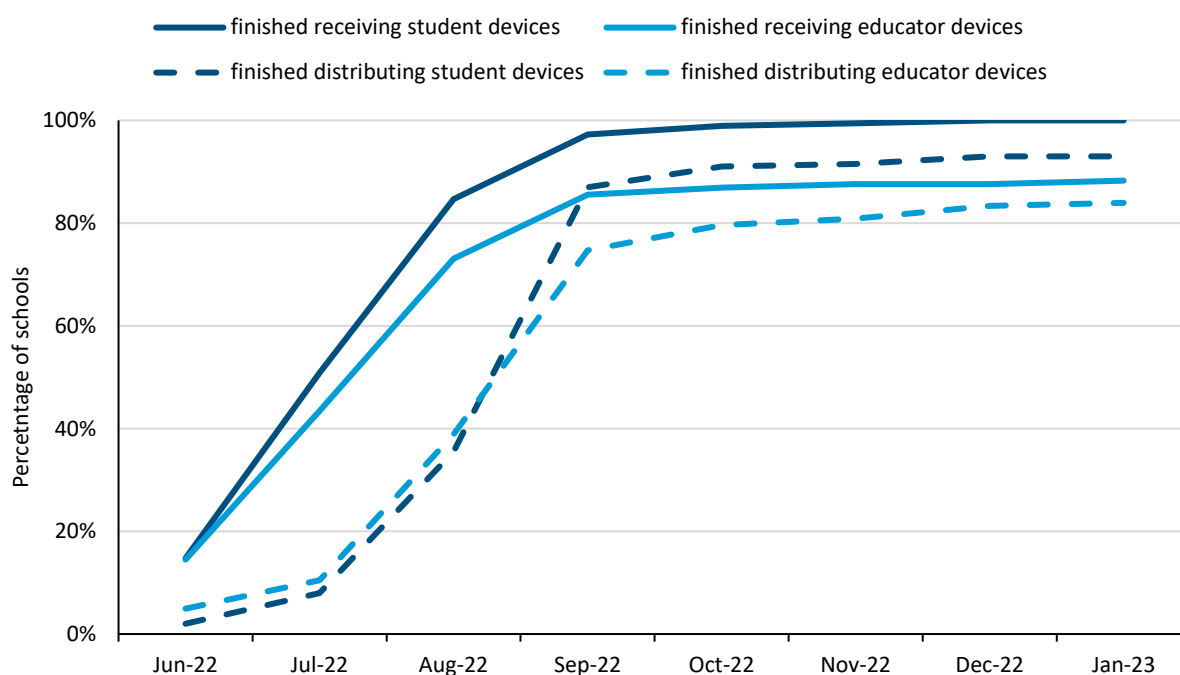
Most schools (85%) received all devices allocated for students by the end of August 2022, and about

Completion of device receipt for students (or educators) was defined as receiving 100% of all devices that were allocated for students (or educators) in 2022–23. **Completion of device distribution** for students (or educators) was defined as distributing 100% of all devices that were received for students (or educators) in 2022–23.

three quarters of schools (73%) received all devices allocated for educators by the end of August 2022 (Exhibit 3). By the end of October, nearly all schools (99%) had received all devices for students, and most schools (87%) had received all devices for educators.

Most schools (87%) finished distributing devices to students by the end of September 2022, and about three quarters (75%) finished distributing devices to educators by the end of September 2022 (Exhibit 4). By the end of October, most schools had finished distributing student devices (91%) and educator devices (80%).

Exhibit 3. Cumulative Percentage of Schools That Finished Receiving and Distributing Devices for Students or Educators, by Month

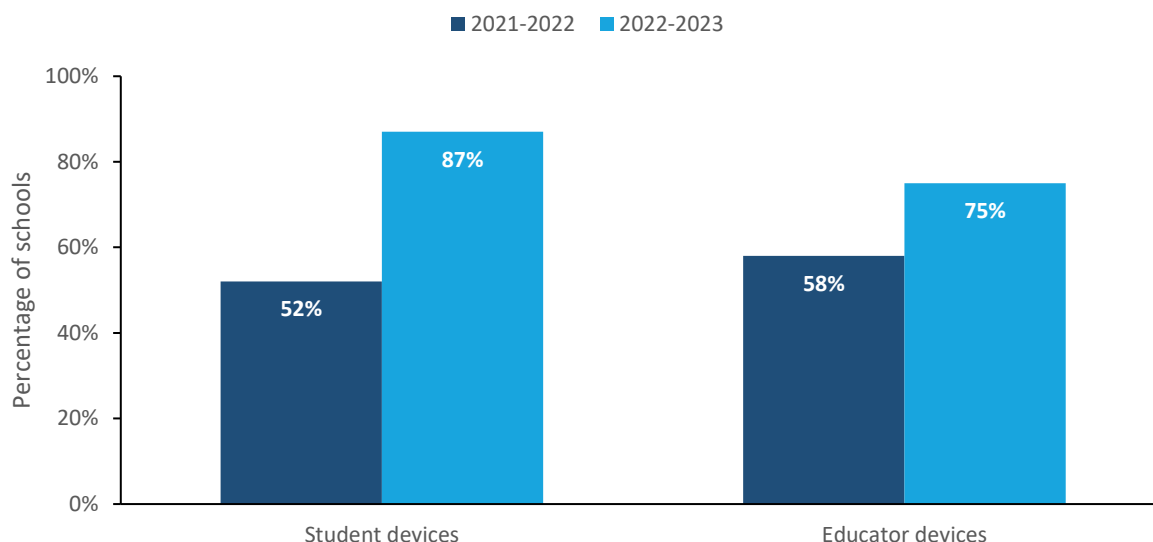


Source: Device Deployment Survey.

Note. Percentages for receiving devices are out of the total number of schools with allocated devices (student devices $N = 183$; educator devices $N = 145$). Percentages for distributing devices are out of the total number of schools with allocated devices in 2022–23, plus 17 schools that were only distributing devices received in previous years (student devices, $N = 200$, educator devices, $N = 162$).

Comparison of distribution timing between 2021–22 and 2022–23. Year 2 showed a large increase in the percentage of schools that had distributed devices by October 1, compared with the percentage of schools that had completed distribution by that time in 2021–22. For student devices, the percentage of schools that had distributed their devices by October 1 increased from about half of schools (52%) in 2021–22 to most schools (87%) in 2022–23. For educator devices, the percentage of schools that had distributed their devices by October 1 increased from about half of schools (58%) in 2021–22 to three out of four schools (75%) in 2022–23 (Exhibit 4).

Exhibit 4. Percentage of Schools That Distributed Devices by October in 2021–22 and 2022–23



Source: Device Deployment Survey, 2021–2022 and 2022–2023.

Note. For distributing student devices, $N_{2021-2022} = 151$ schools; $N_{2022-2023} = 200$ schools. For distributing educator devices, $N_{2021-2022} = 139$ schools; $N_{2022-2023} = 145$ (due to the exclusion of schools that did not allocate devices for educators).

Barriers to the Distribution of Devices and Recommendations to Address Barriers

The Device Deployment Survey included one open-ended item for schools to report issues with the device-ordering process at the school level; 126 of 183 schools (69%) responded to this item.⁸ Of those that responded, most schools (84%) reported that they had few or no issues receiving or distributing their devices this year. Very few schools reported issues with shipping that delayed either their receipt or distribution of devices (6%), general confusion with the ordering process (3%), billing issues (2%), issues with hardware or software (2%), or the timeline for receiving devices (2%).

AIR also interviewed technology coordinators and conducted focus groups in eight schools about conditions supporting technology integration (as described in Section 5). Generally, they stated that MLTI improved access to technology within their school. Technology coordinators at all eight schools said that MLTI helped them provide devices to more students. A teacher at one school said, “I don’t know if we would be capable of having that one-to-one capability for our students, if we didn’t have that MLTI piece.” Teachers at three of the eight schools said that MLTI freed up funds to expand 1:1 devices to additional grade levels or pass older computers to other grade levels. Teachers at two schools also reported that access to computers expanded the types of learning opportunities and activities teachers could provide students in the classroom. A technology coordinator at one school said, “MLTI, by

⁸ This item was not asked on the Device Deployment Survey for the 17 schools that were only distributing devices received in previous years.

providing us devices, so we have enough to be one to one, allows the staff more flexibility in terms of what they offer in their lesson plans within the classroom.”

Summary

MLTI is delivering on its goal of providing devices to students and educators on a one-to-one basis. Based on our analysis of data from the Device Deployment Survey, nearly all schools participating in MLTI received and distributed devices to students on a one-to-one basis. Nearly three quarters of schools received devices for educators on a one-to-one basis, and most of them distributed devices to educators on a one-to-one basis. Most schools completed delivery of these devices early in the school year. Most schools received and distributed all devices for students and educators by October, representing a clear improvement in the timing of distribution from Year 1.

Based on these findings, the initiative was within 1–3 percentage points of meeting the three milestones for students, and within 10–25 percentage points of meeting all three milestones for educators (Exhibit 5; see Appendix A for a summary of all milestones).

Exhibit 5. Completion Status of Milestones for the Program Component of Access to Technology

Milestone	Actual	Criterion reached?
Ninety-five percent of MLTI schools receive 1:1 devices for students and educators (based on allocation and current enrollment).	Ninety-four percent of MLTI schools received 1:1 devices for students, and 72% of MLTI schools received 1:1 devices for educators (based on allocation and current enrollment).	No
Ninety-five percent of MLTI schools distribute 1:1 devices to students and educators (based on allocation and current enrollment).	Ninety-three percent of MLTI schools distributed 1:1 devices to students, and 84% of MLTI schools distributed 1:1 devices to educators (based on allocation and current enrollment).	No
Ninety percent of MLTI schools distribute 100% of their student and educator devices by October 1.	Eighty-seven percent of MLTI schools distributed 100% of their student devices by October 1, and 75% distributed 100% of their educator devices by October 1.	No

Limitations. Several limitations to these analyses should be considered when interpreting the results. First, this year, distribution of MLTI devices was expanded to Grades 6 and 9 from Grades 7 and 8, with allocations determined at the district level based on estimates of enrollment from the previous grade. In districts where multiple elementary schools fed into multiple middle schools, it was impossible for AIR to determine the exact number of devices that should be allocated to each individual middle school. In the limited number of cases where this occurred (fewer than 4% of districts), our approach was to use 2023 actual enrollment counts from the middle schools to determine the proportion of students in the district who attended each school, and to then apply those proportions to the combined district-level allocations from all contributing elementary schools to estimate school-level allocations. It is possible

that slight variations in these allocation estimations from actual enrollment could lead to misestimations of whether devices were in fact received or distributed on a one-to-one basis.

Second, in two districts, responses reporting extremely high numbers of devices on the Device Deployment Survey suggested that the district reported the number of devices across all grade levels (i.e., Grades 6–8), rather than only for the grade level that received devices this year (i.e., Grade 6 in both districts). In these cases, our approach was to again use 2023 enrollment numbers to determine the proportion of students in that school in Grade 6, and to then apply this proportion to the total reported devices received and distributed, to provide an estimate of the number of those reported devices that were for sixth graders. Again, these proportional estimations could be different from actual sixth-grade device allocation and may lead to small discrepancies in the calculation of 1:1 devices received or distributed in those schools.

Section 3. Opportunities for Professional Learning That Emphasize Student-Centered Approaches

This section presents findings about professional learning opportunities developed by MLTI; the extent of school participation in those professional learning opportunities; and teachers' feedback on the professional learning opportunities, including their satisfaction with the resources provided, barriers to participation, and preferences for future opportunities. The findings are based on an analysis of extant program data, teacher survey data, and data from school administrator interviews and teacher focus groups.

These analyses also provide information on the extent to which MLTI 2.0 reached three program implementation milestones about access to professional learning opportunities:

- MLTI staff develop online professional learning opportunity resources (criterion: 20 resources, with at least four resources developed in each of five topic areas).
- MLTI schools participate in online or in-person professional learning opportunities (criterion: 80% of schools).
- Surveyed teachers perceive MLTI professional learning opportunities as useful (criterion: 80% of teachers).

Our findings indicate that MLTI developed 150 online professional learning resources and provided professional learning opportunities via coaching (virtual or in person), self-paced virtual learning, schoolwide events, and hybrid group events (in person and virtual). Overall, most surveyed schools (92%) in MLTI had at least one teacher report participation in at least one type of professional learning opportunity. All teachers agreed that the training provided through MLTI was useful to their work.

Professional Learning Resources Developed and Offered

MLTI developed and provided professional learning opportunities in four formats:

- **Self-paced learning** – opportunities to engage in self-paced online learning through asynchronous viewing of online resources (e.g., YouTube video content)
- **In-person events** – opportunities to participate in synchronous group events held in person (e.g., conferences or presentations at a school site)
- **Hybrid events** – opportunities to participate in events either synchronously or asynchronously, which were presented both virtually and in person (e.g., recorded live sessions of book clubs)
- **Coaching** – opportunities for teachers to engage in synchronous, one-on-one or group coaching with an MLTI digital ambassador, either in person or online

The self-paced learning opportunities comprised podcasts or webinars posted to the MLTI YouTube channel. MLTI digital ambassadors who participated in a focus group stated that they created these

podcasts and asynchronous webinars based on the expressed needs of districts or by anticipating district needs. As indicated by a review of extant artifacts, MLTI ambassadors organized these online professional learning resources into playlists, which the AIR team then coded into 10 topical categories (Exhibit 6).⁹ In total, MLTI developed 150 professional learning resources across 10 topic areas. The topic areas that were most represented on the MLTI YouTube channel were applications and tools (four playlists and 65 videos), digital citizenship (four playlists and 19 videos), student engagement (one playlist and 17 videos), and recipes for project-based learning (three playlists and 11 videos). Based on these findings, MLTI exceeded its stated implementation criterion of creating at least 20 online professional learning resources.

Exhibit 6. Online Professional Learning Resource Categories, Playlists, and Videos

Playlist topical category	Number of playlists	Number of videos
Applications and tools	4	65
Digital citizenship	4	19
Student engagement	1	17
Recipes for project-based learning	3	11
Technology integration	1	10
Active learning	1	9
Digital instructional design	1	6
Computer science and computer science integration	1	5
Blended learning	1	4
Support for ALL: Differentiation in the classroom	1	4
Total	18	150

Source: Artifacts posted to MLTI YouTube channel.

In addition to the podcasts and webinars on the MLTI YouTube channel, MLTI digital ambassadors provided other supports to Maine educators. Under the category of hybrid events, one digital ambassador mentioned facilitating an asynchronous book club about blended learning, where educators conversed twice a month via a digital platform about chapters they had read. In the category of in-person events, MLTI digital ambassadors reported that they had presented at conferences and committee meetings (e.g., Maine School Management Association conference, curriculum director meetings) and provided digital citizenship workshops to educators, students, and parents. Finally, in the category of coaching, digital ambassadors reported that they had provided in-person workshops to

⁹ To categorize the playlists of professional learning resources into topical categories, AIR conducted qualitative coding based on the names of these playlists. In some cases, AIR grouped playlists with similar themes under a single category (e.g., the Digital Citizenship 101 and News & Media Literacy playlists were grouped into the digital citizenship category). In other cases, the MLTI YouTube channel used the same category title for multiple related playlists.

schools whose staff preferred that format. They noted that additional funding may be needed to support schools that request in-person visits.

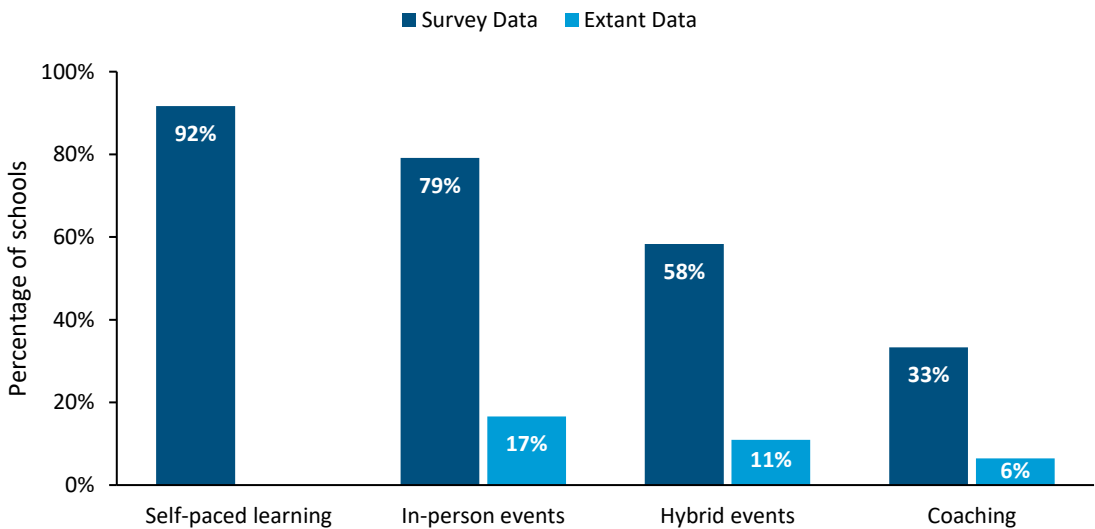
Extent of Participation in Professional Learning Opportunities

We examined the extent of school participation in each of the four formats of MLTI-provided professional learning opportunities, based on responses to the teacher survey (addressing all four formats) and logs of participation recorded by digital ambassadors (addressing the in-person, hybrid, and coaching formats, but not the self-paced learning format). Schools were counted as participating in a MLTI professional learning format if at least one teacher from that school reported participation in that type of MLTI professional learning.

School-level analysis. Overall, data from the teacher survey showed that most of the surveyed schools (96%) participated in at least one format of MLTI professional learning. Data from ambassador logs showed that about one third of all MLTI schools (28%) had at least one teacher participate in any MLTI professional learning opportunity. The extent of school participation in professional learning opportunities varied across formats (Exhibit 7). At most surveyed schools (92%), one or more teachers reported participation in self-paced online learning. At about eight out of ten surveyed schools (79%), one or more teachers reported participation in in-person events. At about half of the surveyed schools (58%), one or more teachers reported participation in hybrid events. Finally, a third of the surveyed schools (33%), one or more teachers reported participation in coaching.

Ambassador logs followed a similar overall pattern but with a much lower percentage of schools participating (Exhibit 7). At about one fifth of all MLTI schools (17%), at least one teacher participated in in-person events. Teachers at fewer schools participated in hybrid events (11% of MLTI schools) and coaching (6%). The discrepancy in percentages between the two data sources may have multiple explanations and is therefore a candidate for further investigation.

Exhibit 7. Percentage of MLTI Schools Participating in Each Format of MLTI Professional Learning Opportunities, Based on Digital Ambassador Logs and Teacher Surveys

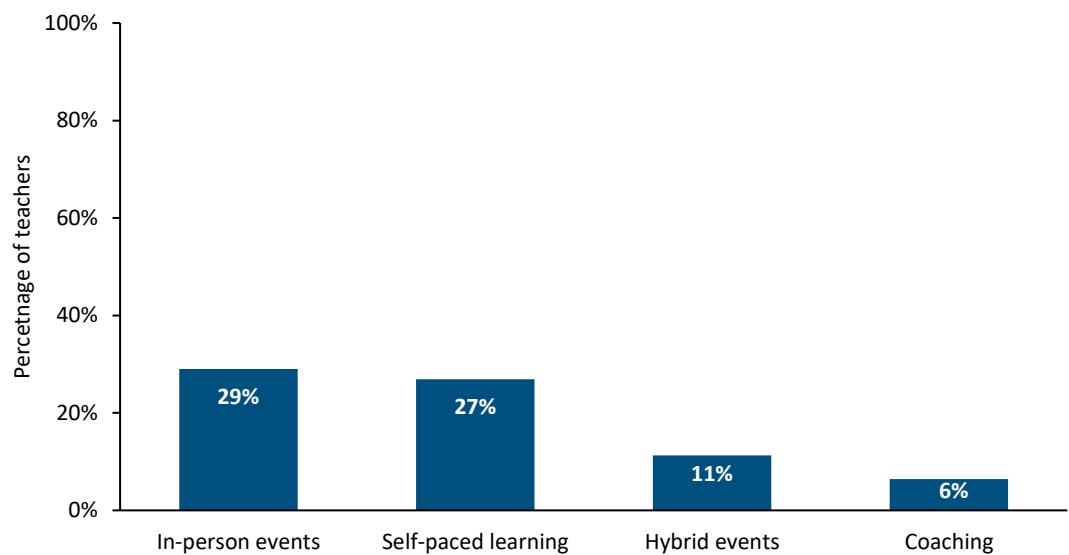


Source: Teacher survey and digital ambassador logs.

Note. Teacher survey, N = 24 schools aggregated from 186 teacher responses. Digital ambassador logs, N=247 schools. Ambassador logs did not provide information on self-paced learning. Schools were counted as participating if at least one teacher from that school participated in a professional learning opportunity.

Teacher-level analysis. We used the teacher survey data to describe the overall percentage of teachers who participated in each type of MLTI professional learning opportunity, and who participated in any type of professional learning opportunity. Nearly half of the surveyed teachers (49%) reported that they participated in at least one form of MLTI professional learning.¹⁰ About one quarter of teachers participated in either in-person events (29%) or self-paced learning (27%) (Exhibit 8). Fewer teachers indicated that they had participated in hybrid learning opportunities (11%) or coaching with an MLTI ambassador (6%).

Exhibit 8. Percentage of Teacher Survey Respondents Participating in Each Type of MLTI Professional Development



Source: Teacher survey.

Note. N = 186 teachers. Survey items: In-person events = “In-person group offering (e.g., conference presentation)”; Self-paced learning = “Online asynchronous series offering (e.g., multiple video recordings on a specific topic)”; Coaching = “One-on-one coaching (virtual or in person) with an MLTI Ambassador”; and Hybrid = “Online hybrid offering (e.g., book studies).” The percentage for self-paced learning events includes three teachers who responded “other” and provided open-ended responses we recategorized as self-paced learning.

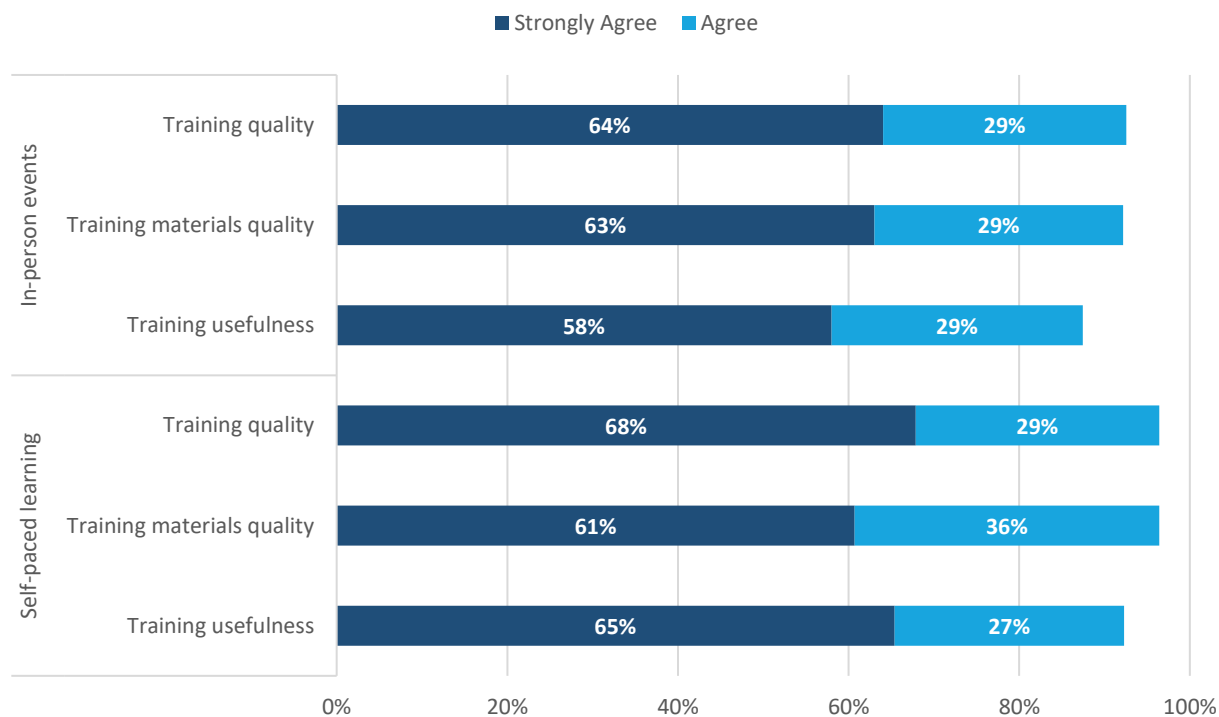
¹⁰ Last year, 9% of surveyed teachers indicated that they participated in any MLTI professional development. However, the phrasing of the question was, “Did you receive professional development provided by the MLTI team this year?” This is not comparable with the methodology of this year’s teacher survey.

Participant Feedback on Professional Learning Opportunities

The evaluation team examined teacher feedback on the quality and usefulness of the professional learning opportunities, as captured through items on the post-event surveys administered by the MLTI team and items on the MLTI teacher survey administered by the AIR evaluation team. Teachers were also given an opportunity to provide feedback on additional forms of professional development that may be useful through an open-ended item on the MLTI teacher survey, and in interviews with school technology coordinators and focus groups with teachers in the sample of eight MLTI schools.

Satisfaction with MLTI professional learning opportunities. Post-event surveys administered after participation in self-paced learning and in-person events presented teachers with three items about their satisfaction with the training quality, training material quality, and training usefulness. Overall, most teachers (at least eight of out 10) agreed or strongly agreed that the training and training materials were of high quality, and that the trainings were useful. Results were comparable across both in-person events and self-paced learning (Exhibit 9).

Exhibit 9. Satisfaction With MLTI Professional Learning Opportunities



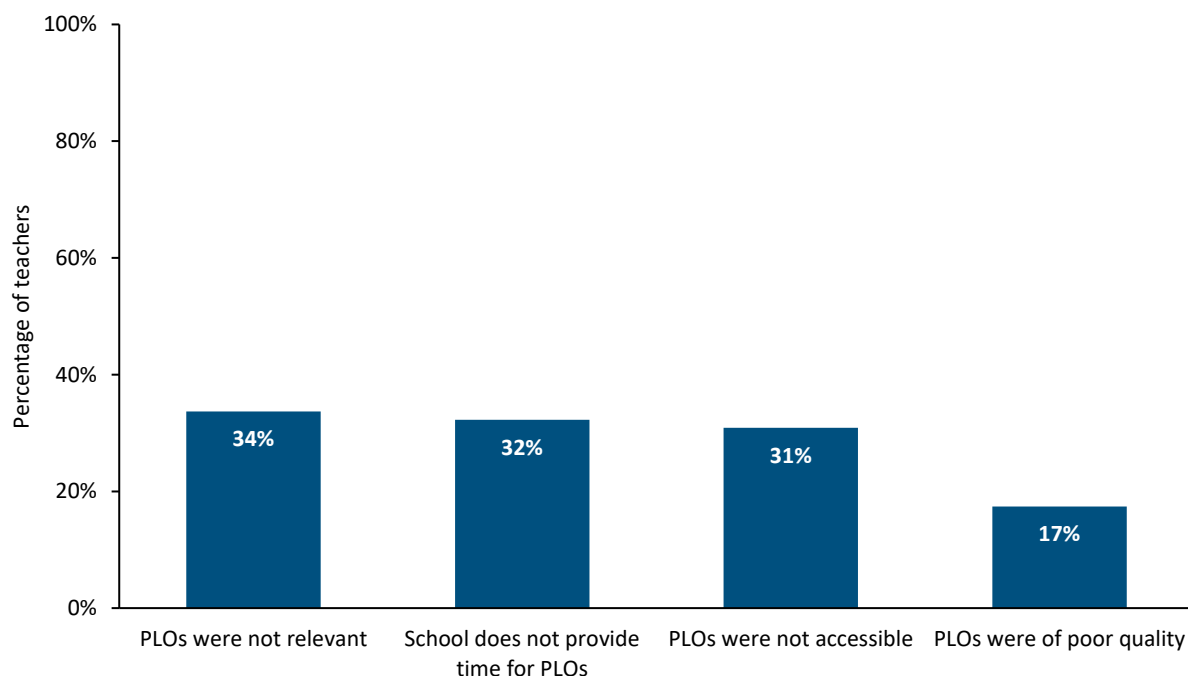
Source: Post-event surveys.

Note. In-person events $N = 230\text{--}242$. Self-paced learning, $N = 26\text{--}28$. Survey items asked respondents to rate their agreement with the following statements: “Training was of high quality,” “Training materials were high quality,” and “Training was useful to my work.” Response options of Strongly Agree or Agree are shown; other options were Partially Agree, Partially Disagree, Disagree, and Strongly Disagree (not shown).

Barriers to participation in MLTI professional learning opportunities. One item in the teacher survey asked participants to rate their agreement with four statements about barriers to participating in

professional learning opportunities. Overall, a majority of teachers (54%) agreed or strongly agreed with at least one of the items (Exhibit 10). About a third of teachers agreed or strongly agreed that professional learning opportunities were not relevant to their needs (34%), that they did not have time to participate (32%), or that the professional learning opportunities were not readily accessible (31%). Relatively few teachers (17%) agreed or strongly agreed that the professional learning opportunities were of poor quality.

Exhibit 10. Teachers' Experience of Types of Barriers to Professional Learning Opportunities



Source: Teacher survey.

Note. *N* = 178–183 respondents. Response options of Strongly Agree or Agree are shown; other options were Disagree and Strongly Disagree (not shown). PLO = Professional learning opportunity.

Additional professional learning opportunities requested by teachers. The survey also presented teachers with an open-ended question about any additional professional learning opportunities focused on educational technology they would find useful. Of the 190 teachers who completed the teacher survey, 112 teachers (59%) identified at least one additional professional learning opportunity they would find useful. The following were the most frequent types of responses:

- Thirty-six teachers requested training on how to use a specific instructional tool (e.g., Google Suite, digital media editing tools, educational games, and programming and analysis tools).
- Thirty-two teachers provided responses related to general professional development on practicing with technology or learning about new types of technology.

- Fifteen teachers requested professional development that went beyond learning how to use instructional tools and was more focused on integrating the technology into their instruction.
- Fifteen teachers requested training on how to use hardware (e.g., general laptop use, interactive whiteboards).
- Fifteen teachers requested training on software for classroom management (e.g., learning management systems, tools for personalized learning).
- Seven teachers requested professional development on instructional tools for specific content areas (e.g., mathematics, computer science, visual arts).

During interviews and focus groups, teachers and school technology coordinators described additional professional learning opportunities they believed would be useful. In six of the eight schools, these staff reported that opportunities to learn about new types of technology would be useful for teachers. Although less frequently reported, teachers and technology coordinators also noted that training on specific technology tools (particularly Google Suite), training on how to teach internet safety to students, and opportunities to practice using technology would be useful (each noted by staff at two schools). These findings are similar to those from the survey, in which 36 teachers requested training on a specific instructional tool (e.g., Google Suite) and 32 teachers requested additional resources related to practicing with technology and learning about new tools. When asked about professional development that would be useful for school leaders, school technology coordinators cited training on specific technology tools (particularly Google Suite; three schools) and opportunities to practice using technology (two schools).

Summary

The MLTI team developed numerous professional learning resources and provided professional learning opportunities in four different formats: in-person events, self-paced learning opportunities, hybrid events, and coaching. Teachers reported positive opinions about the quality and usefulness of MLTI professional learning opportunities. In the past year, most surveyed MLTI schools (96%) had at least one teacher participate in some format of MLTI professional learning, and about three quarters of surveyed teachers (74%) reported that they had participated in some form of MLTI professional learning. Most teachers (at least eight in 10) agreed or strongly agreed that the training and training materials were of high quality and were useful for their work.

About half of the surveyed teachers (54%) indicated there were barriers to participating in professional learning opportunities, with about a third indicating that insufficient relevance, lack of time to participate, and lack of accessibility were the barriers they encountered. Just 17% of surveyed teachers reported that the professional learning opportunities were of poor quality, suggesting that the quality of professional development was not a barrier to participation for most teachers. In terms of additional professional development, teachers most frequently noted that they would like training on how to use a specific instructional tool (e.g., Google Suite), opportunities to practice using technology, or opportunities to learn about new types of technology.

Based on these findings, MLTI met all three milestones related to the program component of providing access to professional learning opportunities (Exhibit 11).

Exhibit 11. Completion of the Access to Professional Learning Opportunities Milestones

Milestone	Actual	Criterion reached?
Develop at least four resources across five topic areas (20 total).	Between four and 65 online resources in each of 10 topic areas (150 total) were developed.	Yes
Eighty percent of MLTI schools participate in professional learning opportunities.	Ninety-two percent of surveyed schools participated in MLTI professional learning opportunities.	Yes
Eighty percent of teachers at MLTI schools agree or strongly agree that the MLTI professional development is useful.	Between 88% and 93% of educators <i>strongly agreed</i> or <i>agreed</i> that the training was useful for their work.	Yes

Limitations. When interpreting these results, it is important to note the following limitation regarding the extant data on teacher participation in professional learning opportunities. Logs of coaching, hybrid, and in-person events were only generated if ambassadors completed the log form. It is therefore possible that a higher number of teachers from all MLTI schools across the state participated in professional learning opportunities, but that these were not recorded in a log. This hypothesis is supported by evidence from the teacher survey, where teachers' self-reports of participation were much higher.

Section 4. Support for District Technology Infrastructure and Technological Infrastructure Programs

This section describes the infrastructure support services provided by Maine DOE and the level of satisfaction among district information technology (IT) staff with the support provided. MLTI provides funding for Maine DOE technology infrastructure specialist staff to work with schools and districts to develop additional programs for students in the technological infrastructure field (Maine Department of Education, n.d.). This year, MLTI hired an infrastructure specialist focused on outreach and school support around technology infrastructure. This analysis examines those activities using infrastructure specialist reports and participant satisfaction data from surveys provided to district IT staff by the MLTI team.

These analyses also provide information on the extent to which MLTI 2.0 successfully reached three program milestones related to access to infrastructure (see Appendix A for a summary of program milestones):

- The state infrastructure specialist delivers technology infrastructure presentations (criterion: four presentations).
- The state infrastructure specialist conducts site visits with schools (criterion: 14 districts).
- IT staff who receive IT support report satisfaction with the support received (criterion: 80% of staff).

Our findings indicate that MLTI provided the technology infrastructure support activities as intended, and that school staff expressed satisfaction with this support.

Provision of Technology Infrastructure Support

The technology infrastructure specialist assisted schools through three different categories of technology infrastructure support:

- **School-based site visits.** The technology infrastructure specialist conducted site visits to check in with IT staff and address particular areas of concern for that school or district.
- **Practitioner-focused conferences on technology infrastructure.** The technology infrastructure specialist presented information to district staff at conferences.
- **Presentations.** The technology infrastructure specialist developed and delivered presentations, either remotely as a virtual webinar or in person at conferences, on different topics of interest (e.g., cybersecurity).

According to logs of infrastructure support provided by Maine DOE, the technology infrastructure specialist conducted 14 site visits during the 2022–23 school year. Eleven of these were with current MTI schools, reaching approximately 4% of the population of MLTI schools. The technology infrastructure specialist developed and delivered the following three presentations this year:

- **Cybersecurity for Business Managers.** This presentation discussed the importance of a cybersecurity plan, cybersecurity insurance, and the role of business managers in protecting districts from financial loss from a cybersecurity breach.
- **The School Cyber-Puzzle.** This presentation provided an overview for school administrators of local laws and policies regarding educational technology issues such as cybersecurity, cyber bullying, and privacy; and local resources and organizations available for technology support.
- **Shields Up Maine.** This presentation discussed the highlights and key learnings from nine working group sessions of IT directors from 10 school administrative units (SAUs) participating in Shields Up Maine (an ongoing working group of 10 SAUs organized by MLTI 2.0).

These presentations were delivered both virtually and in person to district staff at four different in-person conferences: the Maine Association of School Business Officials, the Association of Computer Technology Educators of Maine, the Maine School Management Association, and Shields Up Maine. Fifteen schools attended these conference sessions, 13 of which were on the list of current participating MLTI 2.0 schools (approximately 5% of schools).

Exhibit 12. The Number and Percentage of Schools That Received Technology Infrastructure Supports in Each Category

Type of events	N total supports provided	N MLTI schools receiving any support	% MLTI schools receiving support
Site visits	14	11	4% of MLTI schools
Conferences	4	13	5% of MLTI schools
Presentations	3	—	—

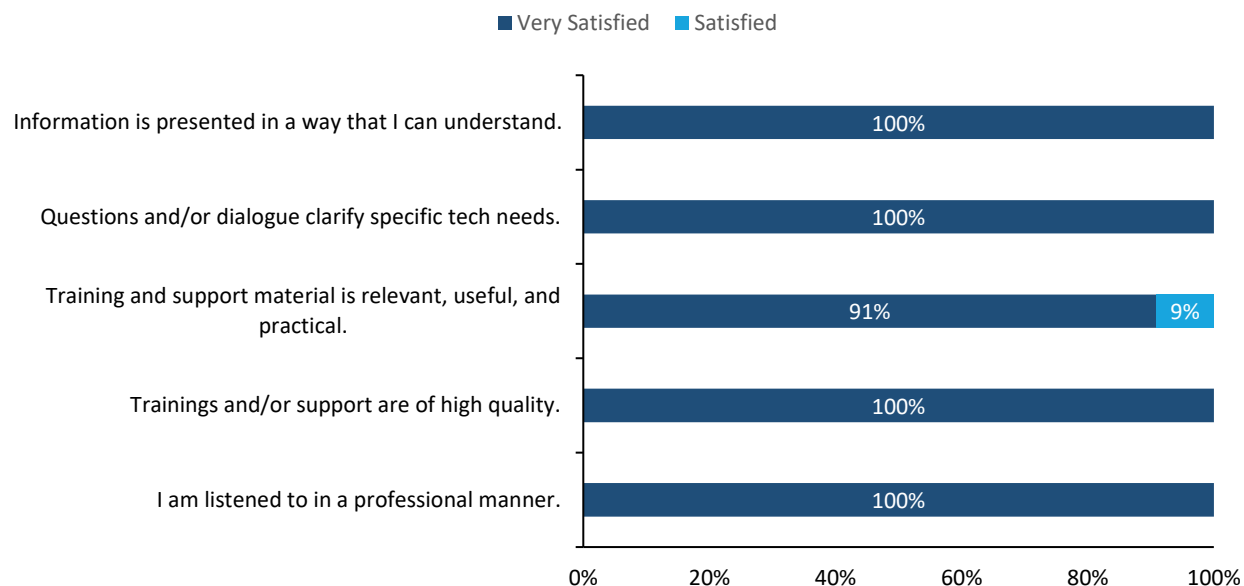
Source: Infrastructure specialist logs.

Note. Total *N* = 247 MLTI schools. Due to the open-access nature of the presentation format, we were unable to capture the school affiliation of attendees this year.

Satisfaction With Infrastructure Support

MLTI collected satisfaction surveys on the quality of support received from the state technology infrastructure specialist from a staff member at each of the 11 schools where site visits were conducted. Overall, feedback was positive. Ten respondents reported that they were very satisfied with all aspects of the infrastructure support. One respondent reported that they were very satisfied with four of the five aspects of infrastructure support and satisfied with the remaining aspect of support (Exhibit 13).

Exhibit 13. Satisfaction With Infrastructure Support Site Visits



Source: IT staff satisfaction surveys collected by MLTI.

Note. N=11. Response options of Very Satisfied and Satisfied are shown; other options were Dissatisfied and Very Dissatisfied (not shown).

Summary

Overall, the state technology infrastructure specialist conducted 18 events intended to support MLTI 2.0 districts and schools in providing adequate technology infrastructure. The IT staff members surveyed at the 11 schools visited by the state technology infrastructure specialist were quite satisfied with the level of support provided by the specialist.

Based on the findings reported in this section, MLTI achieved all three milestones for access to infrastructure (Exhibit 14; see Appendix A for a summary of all program milestones).

Exhibit 14. Summary of Successful Completion of the Access to Infrastructure Milestones

Milestone	Actual	Criterion Reached?
The state infrastructure specialist conducts four presentations.	The infrastructure specialist created three presentations on infrastructure support that were presented to district staff at four events.	Yes
The state infrastructure specialist conducts 14 site visits.	The infrastructure specialist visited 14 school sites.	Yes
Eighty percent of IT staff who receive IT support are satisfied or very satisfied that the infrastructure support is useful.	One hundred percent of teachers were either satisfied or very satisfied with the infrastructure support.	Yes

Section 5. Teacher and Student Use of Technology

This section presents findings on the extent to which teachers used technology to support their instruction and productivity, and to promote student-centered learning. As specified in the MLTI 2.0 Guiding Principles (Maine Department of Education, 2020), teachers are expected to use technology to afford students opportunities for student-centered learning that involve collaboration, communication, creativity, and critical thinking.

This section also presents findings about tools and technologies for supporting student-centered learning. It describes how frequently teachers use different types of technology tools for instruction, as well as types of additional tools teachers would like to access. The data sources for these findings are the teacher and student surveys. Teachers' beliefs about and attitudes toward technology are also discussed, particularly their confidence in using technology and their beliefs about its usefulness for teaching and learning.

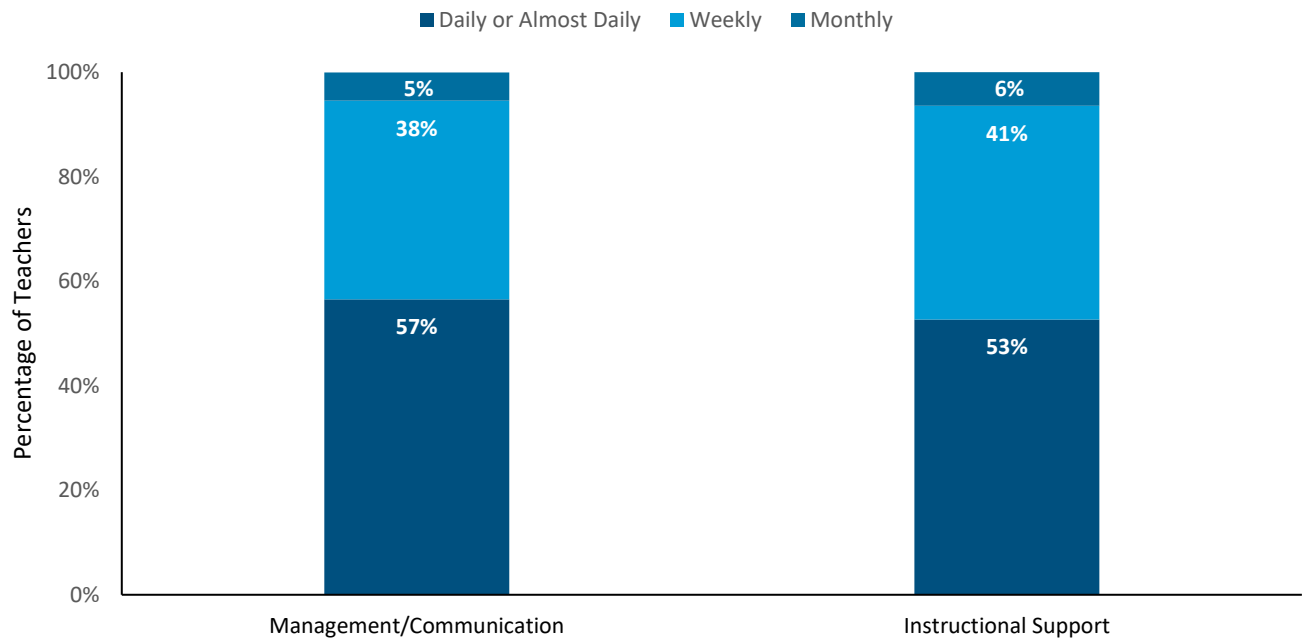
Finally, we examine how overall responses to survey items about confidence in using technology, beliefs about technology, and use of technology in the classroom have changed over the 2 years of MLTI 2.0 implementation, when aggregated within regions across the survey sample of teachers. We conducted regression analyses to examine change in the mean scale score of teacher responses between Year 1 and Year 2, nested within region and controlling for a range of school-level characteristics (as described in the Evaluation Methods). Overall, we found statistically significant decreases in all of these outcomes.

Teacher Use of Technology for Instruction

This section examines teacher reports of how frequently they used technology to support classroom instruction, or for classroom management and communication. Analyses calculated a single Rasch scale score for each type of technology use, based on teachers' responses to four items about using technology to support classroom instruction and six items about using technology for classroom management and communication (see Appendix C for items). For each type of technology use, the percentage of teachers in each response category (i.e., Daily or Almost Daily, Weekly, Monthly, or Less Than Monthly) was calculated based on the response category where their overall scale scores were most likely to be observed. In other words, a teacher whose scale score indicated a typical response of weekly for the four individual items related to using technology to support classroom instruction would be categorized as a weekly user for this overall topic (see Evaluation Methods section for details).

Overall, all surveyed teachers (100%) reported that they used technology to support classroom instruction and management and communication at least once a month. A majority of teachers reported that they used tools on a daily or almost daily basis, both to support instruction (53%) and for classroom management and communication (57%). About two fifths of teachers reported that they used technology for these purposes on a weekly basis. Very few reported using technology for these purposes on a monthly basis (Exhibit 15).

Exhibit 15. Teacher Use of Technology for Instructional Support and for Management and Communication



Source: Teacher survey.
Note. *N* = 184 surveyed teachers for items about instruction. *N* = 186 surveyed teachers for items about management and communication. This sample is limited to teachers who completed these items in the MLTI teacher survey. The percentage of teachers in each response category is based on the response category where teachers’ scale scores were most likely to be observed.

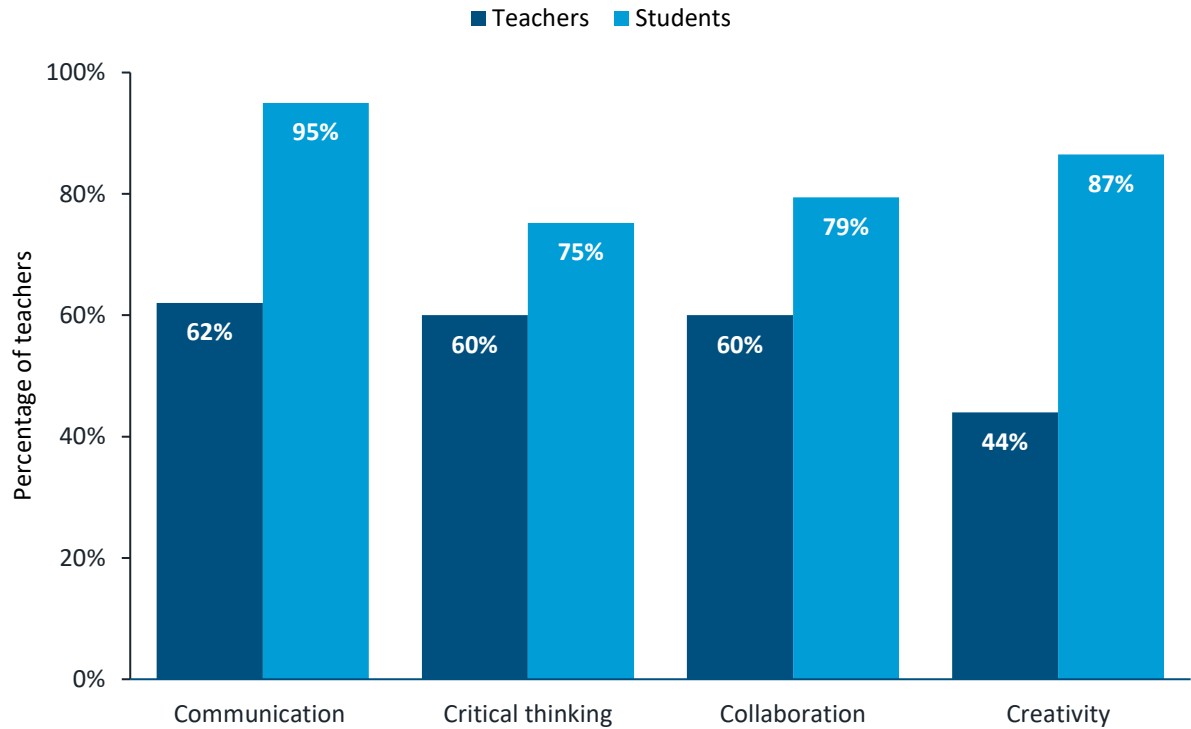
Use of Technology for Collaboration, Communication, Creativity, and Critical Thinking

The evaluation team examined teacher and students reports of the frequency of student technology use for the 21st century skills of collaboration, communication, creativity, and critical thinking. Teachers and students described how frequently students used technology for four to six activities related to each of these skills. The evaluation team calculated the proportion of teachers who emphasized student technology use for each skill, which we defined as students being asked to use technology at least monthly in two or more ways for a particular skill (see Methods for more details). Students rated the frequency of their technology use for the same activities, reporting how frequently teachers in *any* of their classes asked them to use technology for those purposes.

Overall, the proportion of surveyed teachers who emphasized student technology use for these four skills differed across skills. Nearly two thirds emphasized student technology use for communication, collaboration, and critical thinking, while fewer than half (44%) emphasized student technology use for creativity (Exhibit 16). Relatively high proportions of surveyed students (75% to 95%) reported

classroom emphasis on technology use across all four skills, with nearly all students reporting frequent use of technology for communication activities.

Exhibit 16. Percentage of Surveyed Teachers Emphasizing Student Use of Technology for Communication, Collaboration, Critical Thinking, and Creativity

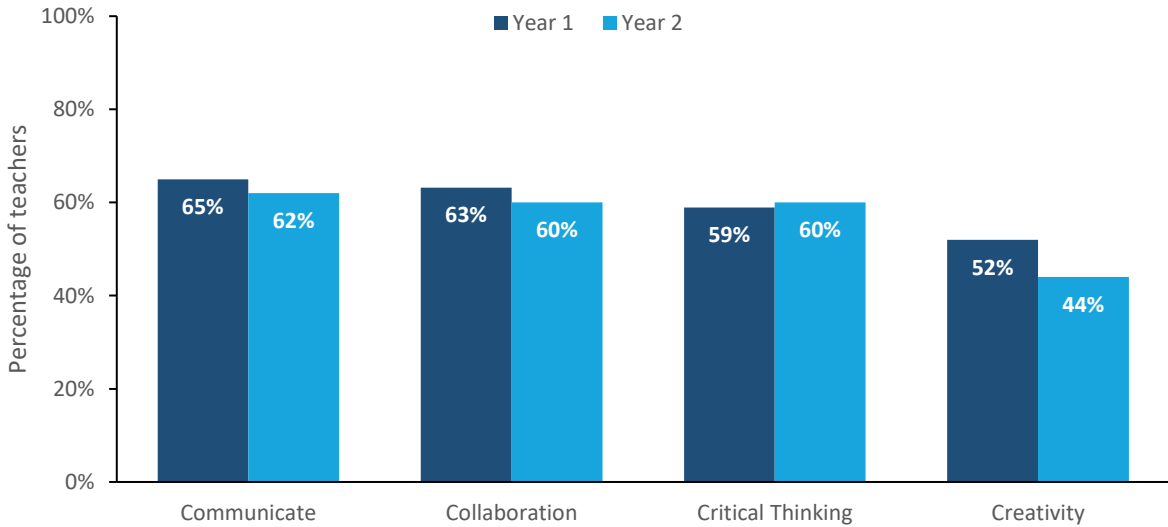


Source: Teacher survey and student survey.
Note. $N = 181$ teachers; $N = 1,392\text{--}1,404$ students. Percentages refer to the percentages of surveyed teachers who reported that they asked students to use classroom technology at least monthly for at least two activities in each of four categories (communication, critical thinking, collaboration, and creativity).

The proportion of teachers reporting frequent student technology use for each skill was similar to but somewhat lower than the proportions reported in last year’s survey: about 3 percentage points lower for communication and collaboration, and 8 percentage points lower for creativity (Exhibit 17). We compared the means for the overall scale score (predicated on all four categories of student technology use) and found that there was a significant decrease ($b=.29, p=.007$) in teachers’ reported frequency of student technology use from Year 1 to Year 2 of the initiative.¹¹

¹¹ As described in the Evaluation Methodology section, Rasch analyses did not support composing individual subscales for each of the four categories of technology use, but they did support composing a single factor scale across all items.

Exhibit 17. Percentage of Surveyed Teachers Emphasizing Student Use of Technology for Communication, Collaboration, Critical Thinking, and Creativity, by Program Year



Source: Teacher survey.

Note. N = 187 for Year 1 survey and 181 for Year 2 survey. Percentages refer to the percentages of surveyed teachers who reported that they asked students to use classroom technology at least monthly for at least two activities in each of four categories (communication, critical thinking, collaboration, and creativity).

The following sections describe the rated frequency of student technology use for specific activities within the four 21st century skill categories.

Technology for communication. For five of the six activities that used technology for communication, a majority of surveyed teachers and students reported frequent classroom technology use (see Exhibit 18).

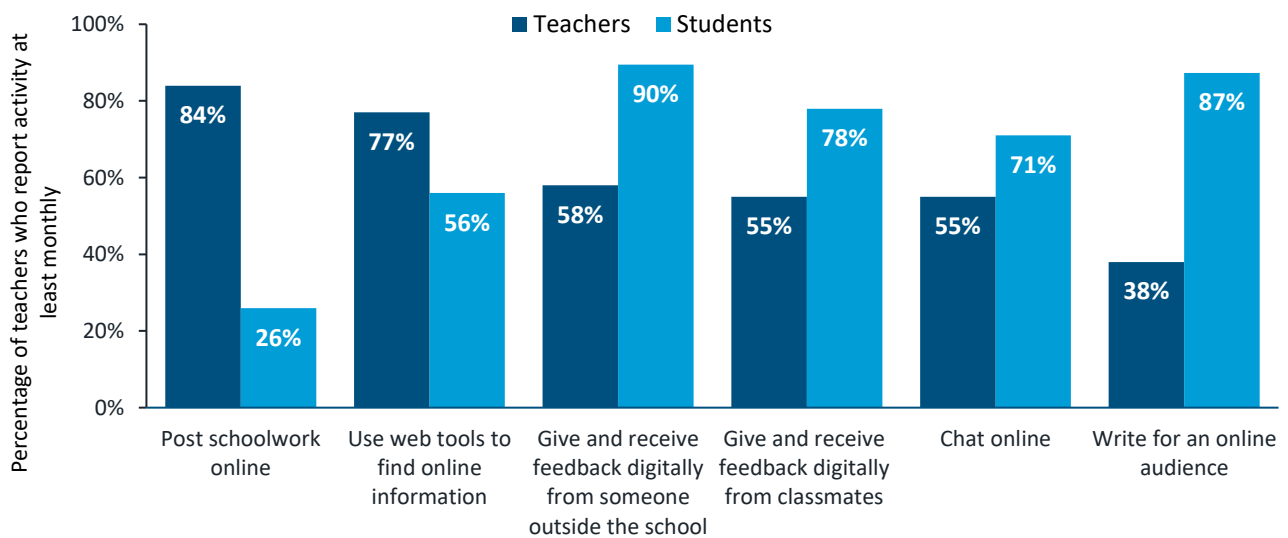
- A majority of teachers (55%–58%) emphasized student technology use at least monthly for the following purposes:
 - To receive feedback digitally from someone outside their school (58%)
 - To chat online (55%)
 - To give and receive feedback digitally from classmates (55%)

Between 71% and 90% of students reported using technology to receive digital feedback from outside the school (90%), chat online (71%), and give or receive feedback from classmates (78%) at least monthly. The higher frequency ratings among students (here and for all the other technology use items) may reflect the fact that students reported on all of their classes, while teachers only reported on the classes they taught.

- About two fifths of teachers (38%) reported asking their students to write for an online audience at least monthly, and nearly nine in 10 students (87%) reported doing so at least monthly.

- For two items, teachers reported more frequent student use of technology than students. More than three quarters of teachers reported asking their students to use technology to post schoolwork online (84%) and use web tools to receive online information (77%) at least monthly. Far fewer students (26% and 56%, respectively) reported participating in these activities at least monthly. These opposing reports of technology use may indicate that students and teachers interpreted the survey items differently, or again may suggest that students were reporting on technology use in classes other than those taught by the responding teacher.

Exhibit 18. Percentage of Surveyed Teachers Asking Students at Least Monthly to Use Technology to Communicate in Various Ways



Note. $N = 176$ – 180 teachers. $N = 1,308$ – $1,378$ students. Percentages refer to the percentages of surveyed teachers or students who reported that teachers asked students daily, weekly, or monthly to use technology for various activities. The teacher survey item stem asked, “How frequently do you ask a majority of your students to...” The student survey item stem asked, “How often do your teachers ask you to do the following in any of your classes?”

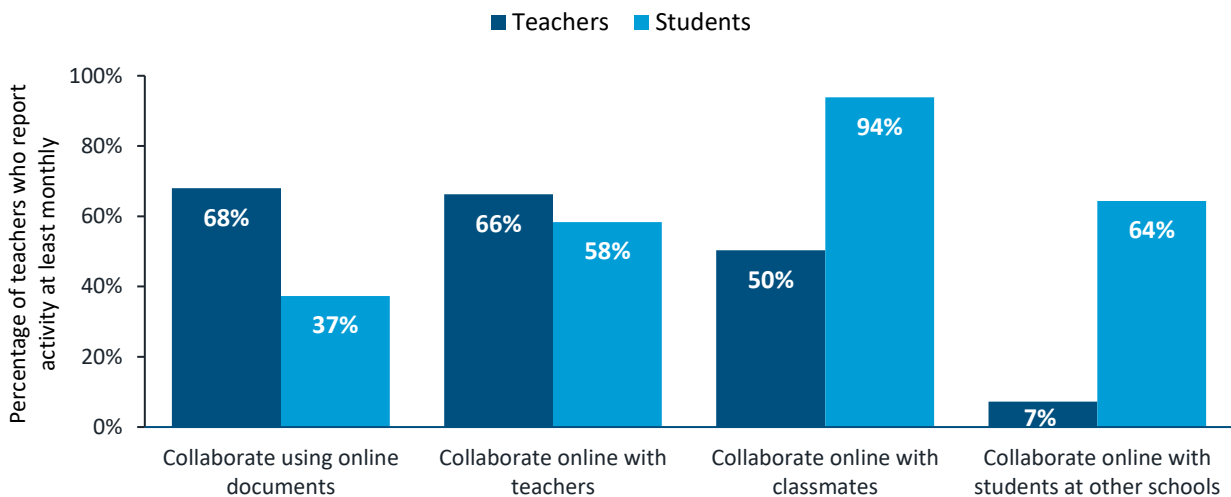
Technology for collaboration. Across the four activities that used technology for collaboration, the proportion of surveyed teachers and students reporting frequent technology use varied substantially (see Exhibit 19).

- About two thirds of teachers and students reported that teachers asked students to collaborate online with teachers (66% and 58%, respectively).
- While 68% of teachers emphasized student use of technology to collaborate using online documents at least monthly, just 37% of students indicated that they were asked by their teachers to do so.
- Between 64% and 94% of students emphasized using technology at least monthly for the following purposes:

- o To collaborate online with students at other schools (64%)
- o To collaborate online with classmates (94%)

However, a much lower percentage of teachers reported asking students to use technology to collaborate online with students at other schools (7%) or to collaborate online with classmates (50%). One possible reason for this large difference is that students reported collaboration with students from other schools that occurred during activities outside the school day, in which classroom teachers were not involved.

Exhibit 19. Percentage of Surveyed Teachers Asking Students at Least Monthly to Collaborate in Various Ways



Note. $N = 178$ – 181 teachers. $N = 1,376$ – $1,401$ students. Percentages refer to the percentages of surveyed teachers or students who reported that teachers asked students daily, weekly, or monthly to use technology for various activities. The teacher survey item stem asked, “How frequently do you ask a majority of your students to...” The student survey item stem asked, “How often do your teachers ask you to do the following in any of your classes?”

Technology for critical thinking. Across the five activities that used technology for critical thinking, teachers and students were more aligned in their reporting of technology use than for the other 21st century skills (see Exhibit 20). Roughly half to two thirds of students, and half to three quarters of teachers, reported frequent use of technology for each activity.

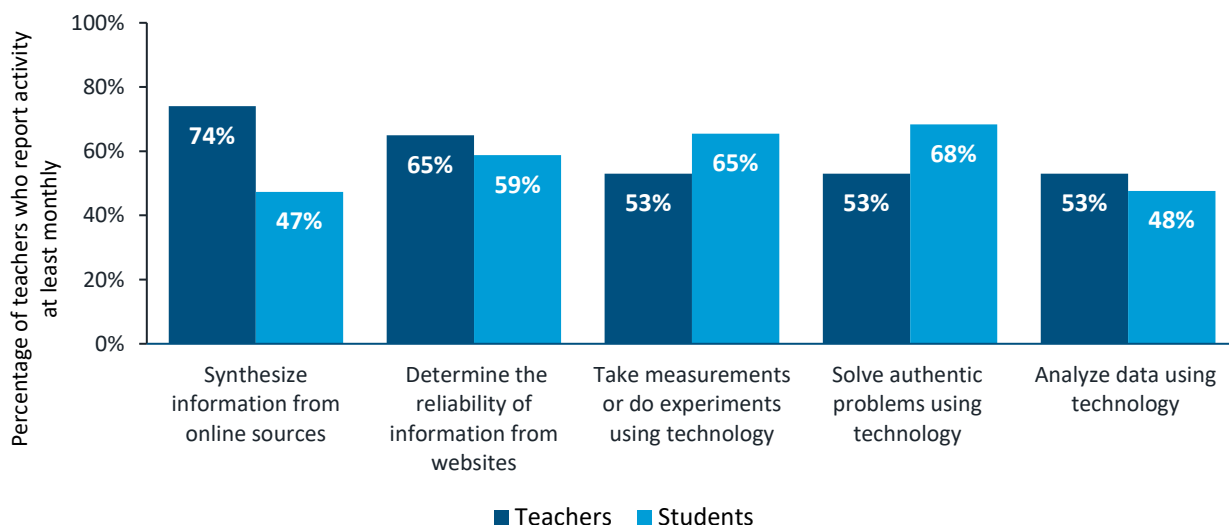
- Nearly half of surveyed teachers (53%) and students (48%) indicated that students used technology at least monthly to analyze data.¹²
- Fifty-three percent of teachers and about two thirds of students reported student technology use to solve authentic problems (68%) and take measurements (65%).

¹² This item was phrased differently in the student and teacher surveys, which may account for this difference. The teacher item read, “Analyze data using technology.” The student item read, “Collect and analyze data using technology.” It is possible that students did not count activities in which they analyzed data they did not collect themselves.

- Between 65% and 74% of teachers emphasized student technology use at least monthly for the following purposes:
 - To determine the reliability of information from websites (65%)
 - To synthesize information from online sources (74%)

However, these percentages were lower among students. Fifty-nine percent of students reported being asked to use technology to determine the reliability of information from websites, and 47% reported being asked to synthesize information from online sources. The lower percentages among students for these two items ran counter to the typical trend for the full set of technology use items. These two items were re-worded for the student survey to reflect a vocabulary level appropriate for students (see Appendix C for survey items) and it is possible that students and teachers had different understandings of the items.

Exhibit 20. Percentage of Surveyed Teachers Asking Students at Least Monthly to Use Technology for Critical Thinking in Various Ways



Note. $N = 177$ – 178 teachers. $N = 1,375$ – $1,382$ students. Percentages refer to the percentages of surveyed teachers or students who reported that teachers asked students daily, weekly, or monthly to use technology for various activities. The teacher survey item stem asked, “How frequently do you ask a majority of your students to...” The student survey item stem asked, “How often do your teachers ask you to do the following in any of your classes?”

Technology for creativity. For two of the four activities that used technology for creativity, teacher and student survey respondents were more aligned in their reporting of technology use (see Exhibit 21). About two thirds of teachers and students emphasized student technology use at least monthly for the following purposes:

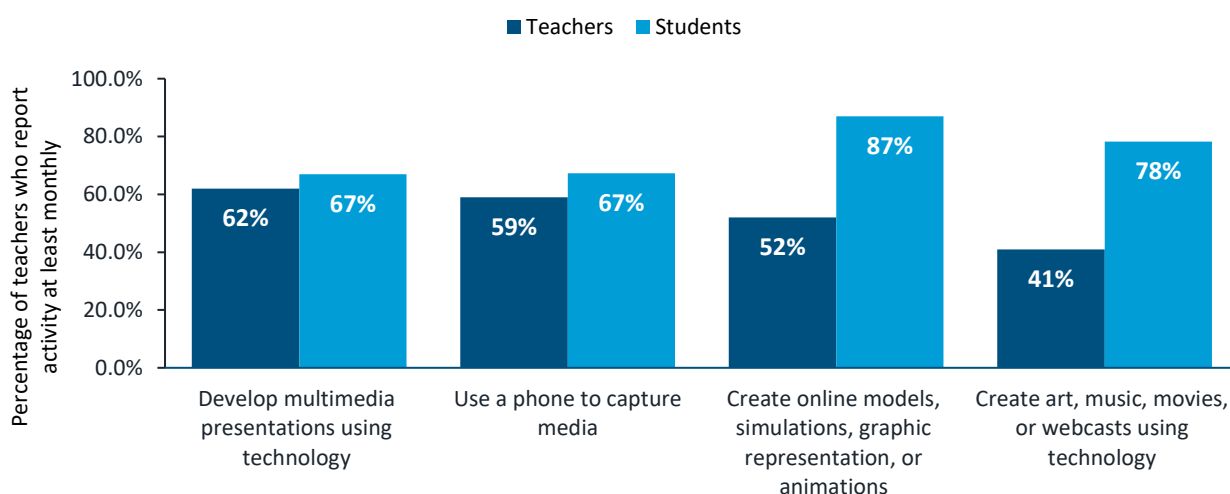
- To use a phone to capture media (59% and 67%, respectively)
- To develop multimedia presentations using technology (62% and 67%, respectively)

For the other two activities that used technology for creativity, there was a large divergence in student and teacher survey responses.

- Between 41% and 52% of teachers emphasized student technology use at least monthly for the following purposes:
 - To create art, music, movies, or webcasts using technology (41%)
 - To create online models, simulations, graphic representation, or animations (52%)

However, larger percentages of students reported being asked to use technology to create art, music, movies, or webcasts (78%); and to create online models, simulations, graphic representation, or animations (87%). Again, it may be that students reported more of this type of technology use in specific classes (e.g., art or music class) that were not taught by the teachers who responded to the survey.

Exhibit 21. Percentage of Surveyed Teachers Asking Students at Least Monthly to Use Technology to Create Various Types of Products



Note. $N = 179$ – 180 teachers. $N = 1,363$ – $1,378$ students. Percentages refer to the percentages of surveyed teachers or students who reported that teachers asked students daily, weekly, or monthly to use technology for various activities. The teacher survey item stem asked, “How frequently do you ask a majority of your students to...” The student survey item stem asked, “How often do your teachers ask you to do the following in any of your classes?”

In summary, both students and teachers reported frequent student technology use in ways that related to the 21st century skills of collaboration, communication, creativity, and critical thinking. For each skill, at least three quarters of students reported frequent technology use. For the skills of collaboration, communication, and critical thinking, at least three fifths of teachers reported that they frequently asked students to use technology. The frequency was somewhat lower for the skill of creativity.

For most of the 19 individual activities related to these four skills, a higher percentage of students reported frequent technology use than teachers. This could be attributed to the fact that teachers only

reported on their own classes, while students reported on all of their classes. There were also some items for which the percentage of teachers reporting student technology use exceeded the student percentage. It is possible that teachers and students interpreted these items differently, as some items were worded differently in the student survey to reflect middle school vocabulary.

Teacher Use of Technology Tools

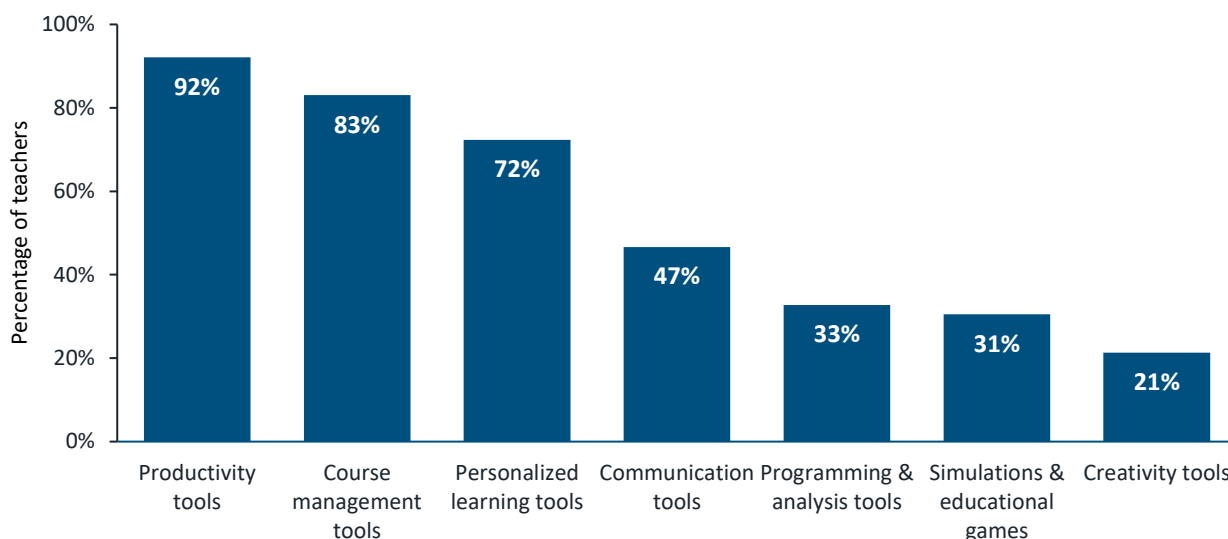
The evaluation team examined promising tools and technologies that teachers use to support student-centered learning—both the tools teachers already use during instruction and additional tools teachers would like to access. For clarity, we organized findings about technology tools into the following seven categories:

- **Productivity tools** (including word processing, presentation, and data processing [spreadsheet] tools)
- **Course management tools** (including learning management software and behavior management systems)
- **Personalized learning tools** (including interactive assessment software, online lessons for the “flipped classroom” approach, and software to support personalized and self-paced learning)
- **Communication tools** (including virtual communication tools and online discussion forums)
- **Programming and analysis tools** (including geography or mapping software and computer programming software)
- **Simulations and educational games** (including simulation software and game-based software)
- **Creativity tools** (including software for video or photograph editing and music production or editing)

Surveyed teachers’ frequency of technology tool use. Across the seven categories of technology tools teachers used in their classrooms, the proportion of surveyed teachers reporting frequent use varied substantially, from 21% to 92% (Exhibit 22).

- Most surveyed teachers used at least one tool from the productivity tool category (92%), the course management tool category (83%), and the personalized learning tool category (72%) at least monthly.
- Nearly half of the surveyed teachers used at least one tool from the communication tool category (47%) at least monthly. About a third of surveyed teachers used at least one tool from the programming and analysis tool category (33%) and the simulations and educational games category (31%) least monthly.
- The creativity tool category had the lowest proportion of teachers reporting at least monthly use. About one fifth of surveyed teachers used at least one tool from the creativity tool category at least monthly (21%).

Exhibit 22. Percentage of Surveyed Teachers Who Reported Using at Least One Tool at Least Monthly in Seven Categories

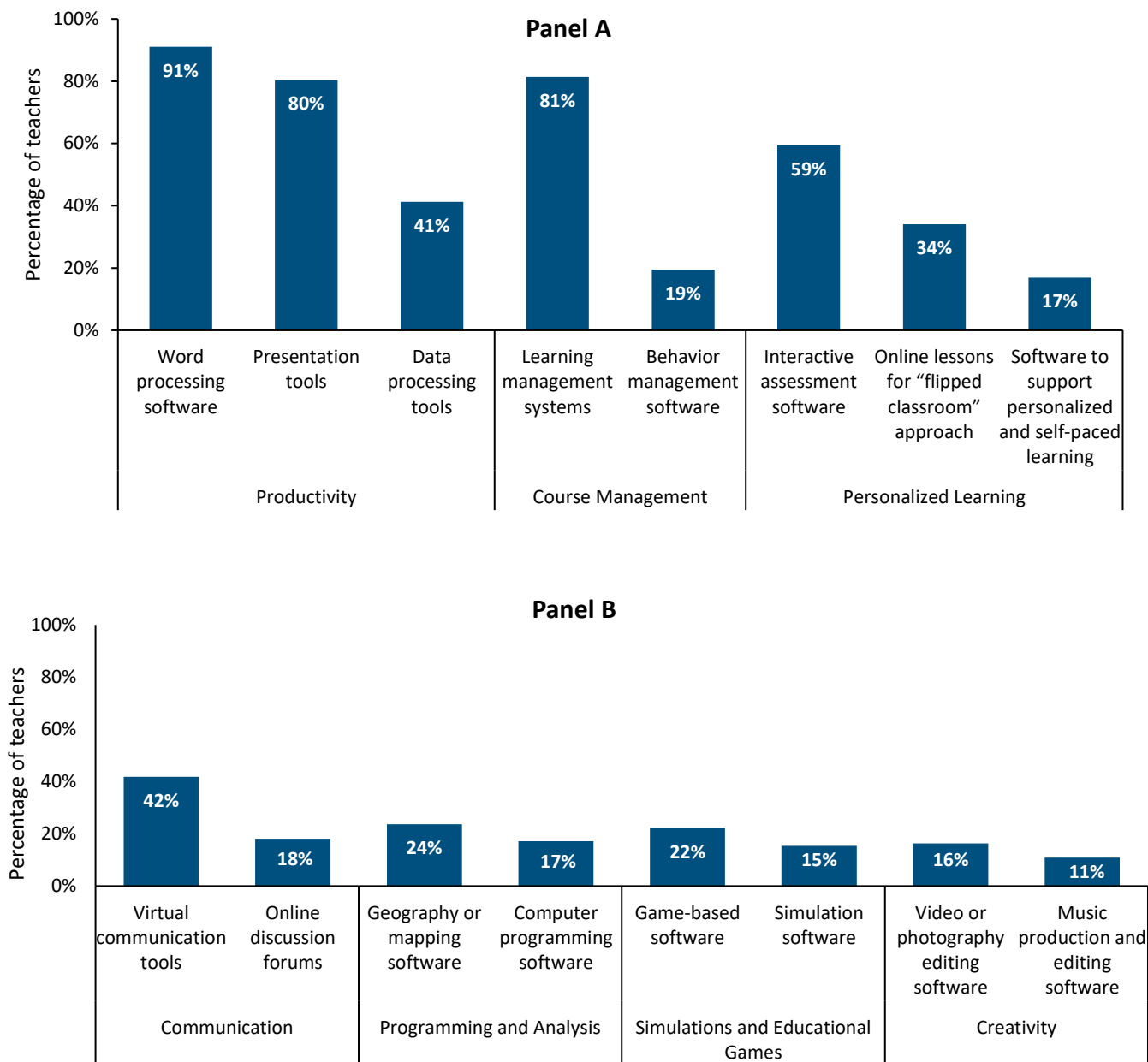


Note. $N = 177\text{--}179$. Percentages indicate the percentages of teachers who reported using at least one tool at least monthly in each category. The survey item stem asked, “Please indicate about how often you use the following software...” Response options included Daily or Almost Daily, Weekly, Monthly, Less Than Monthly, and Don’t Use.

In Exhibit 23, Panel A presents the proportion of surveyed teachers who reported frequent use of specific tools in the three categories with the highest proportion of teachers indicating frequent use: productivity tools, course management tools, and personalized learning tools. Most surveyed teachers reported using word processing software (91%), learning management systems (81%), and presentation tools (80%) at least monthly. Between one third and two thirds of teachers reported using interactive assessment software (59%), data processing tools (41%), or online tools for a flipped classroom approach (34%). Fewer than one fifth of teachers reported using behavior management software (19%) or software to support self-paced learning (Exhibit 23, Panel A).

Panel B in Exhibit 23 presents the proportion of surveyed teachers using specific tools in each of the remaining categories. Fewer than half of surveyed teachers reported using tools for virtual communication (42%). Fewer than one third (11% to 24%) reported frequently using tools for online discussion forums, or in any of the other categories: programming and analysis tools, simulations and educational games, and creativity tools (Exhibit 23, Panel B). It may be that the tools in these four categories tend to be more specialized to content areas than tools in the more frequently used categories. For instance, computer programming software has more specialized uses than word processing software.

Exhibit 23. Percentage of Surveyed Teachers Who Reported Using Specific Tools at Least Monthly



Note. $N = 175\text{--}179$. Percentages indicate the percentages of teachers who reported using each technology tool at least monthly. The survey item stem asked, “Please indicate about how often you use the following software...” Response options included Daily or Almost Daily, Weekly, Monthly, Less Than Monthly, and Don’t Use.

Most requested apps. Of the 190 teachers who completed the survey, 50 teachers (26%) responded to an open-ended item asking what other software and tools they would like to access. Forty-three teachers (23% of those surveyed) identified at least one additional tool they would like to access, including the following:

- Fifteen identified creativity tools for video editing or music production, such as iMovie.
- Seven identified creativity tools for drawing and art, such as TinkerCAD.
- Six identified productivity tools for word processing, such as Adobe.
- Five identified programming and analysis tools, such as Geometer Sketchpad.
- Five identified simulations and educational games, such as Kahoot.

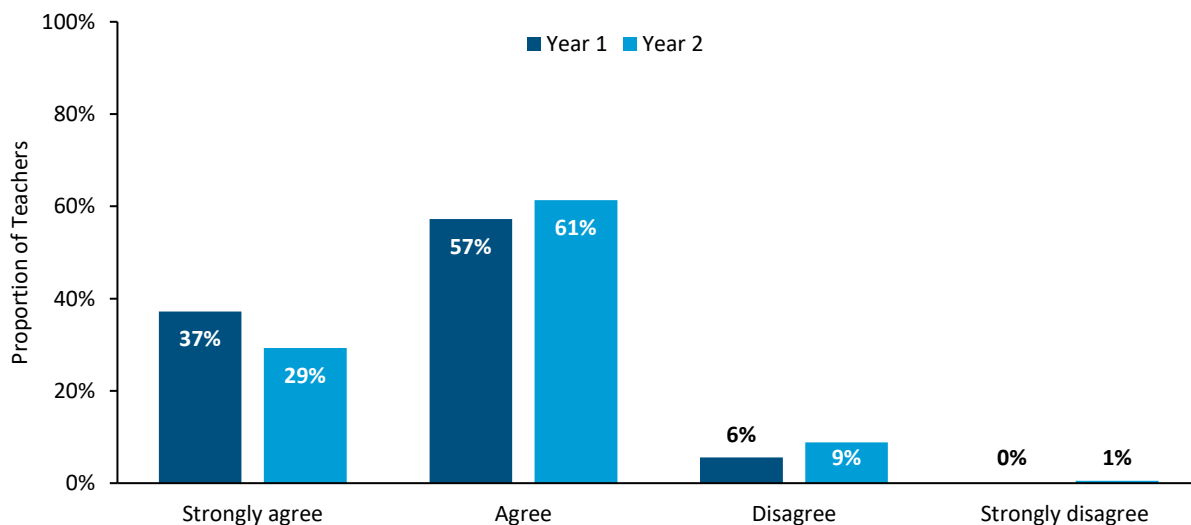
Other tools identified by teacher respondents included productivity tools such as Pear Deck, personalized learning tools such as EdPuzzle and Nearpod, and course management tools such as iDecco.

Teacher Beliefs and Attitudes Regarding Technology

MLTI 2.0 is intended to help teachers use technology to support student-centered learning. This includes fostering greater teacher confidence in their ability to use technology in instruction, as well as more positive beliefs among teachers about the usefulness of technology integration. The teacher survey measured teacher attitudes on both topics, enabling the evaluation team to examine how attitudes and beliefs changed from Year 1 to Year 2.

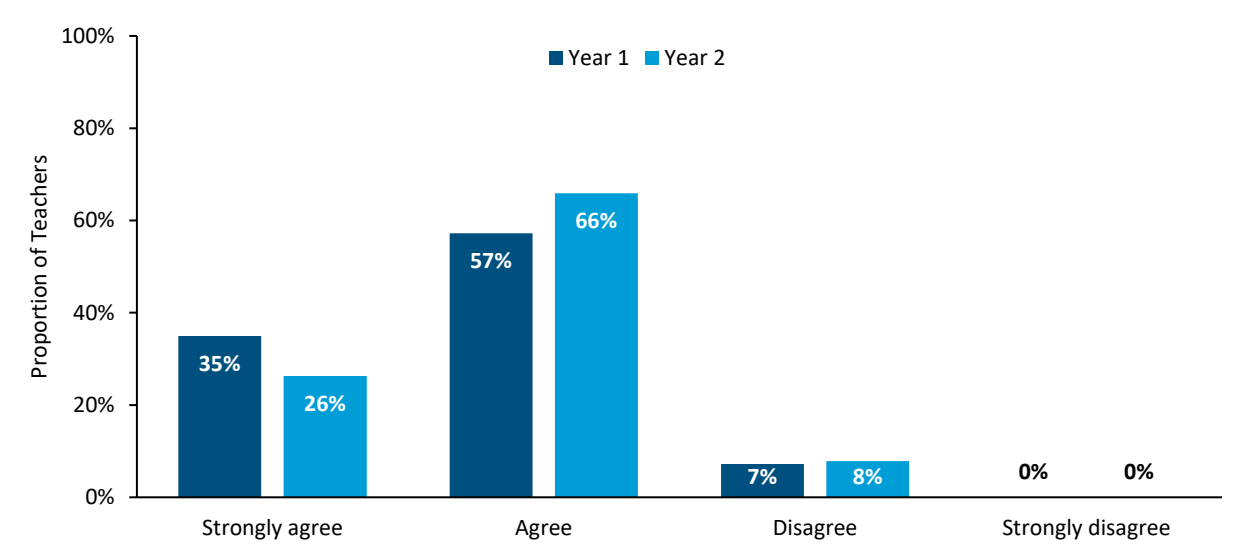
Confidence in using technology. As indicated by their Year 2 scale score for confidence in using technology, most teachers (91%) agreed (61%) or strongly agreed (29%) that they were confident in their ability to use technology. Despite this high level of confidence, there was a statistically significant decrease in teachers' level of confidence compared with Year 1 ($b=1.17, p=.004$), when 94% of teachers agreed (57%) or strongly agreed (37%). Exhibit 24 depicts the proportions of teachers typically selecting each response option for the confidence in using technology scale.

Exhibit 24. Proportions of Surveyed Teachers Categorized By Typical Responses to Confidence in Using Technology Items, by Program Year



Usefulness of technology. We also examined changes in teacher beliefs about the usefulness of technology for instruction. As with confidence in using technology, nearly all teachers (92%) agreed (66%) or strongly agreed (26%) that technology was useful for instruction. Again, however, there was a statistically significant decrease in the strength of this belief compared with Year 1 ($b= 1.94, p<.001$), when 35% of teachers strongly agreed on the usefulness of technology (Exhibit 25).

Exhibit 25. Proportions of Surveyed Teachers Categorized By Typical Responses to Usefulness of Technology for Instruction Items, by Program Year



Summary

All surveyed teachers (100%) emphasized frequent (at least monthly) use of technology to support classroom instruction and to support management and communication. The majority of surveyed teachers used these tools on a daily or almost daily basis to support instruction (53%) and classroom management and communication (57%).

High percentages of teachers and students reported frequent student technology use related to student-centered 21st century skills of communication, collaboration, critical thinking, and creativity. At least three quarters of all surveyed students reported frequent use of technology for these skills. Among surveyed teachers, around three fifths reported that they frequently asked students to use technology for communication, collaboration, and critical thinking, while slightly less than half reported that they frequently asked students to use technology for creativity. Compared with Year 1, there was a 9 percentage point decrease in the proportion of teachers who frequently asked students to use technology for creativity, and there was a statistically significant overall decrease in frequency of asking students to use technology overall (i.e., across all types of student-centered technology uses). Technology uses reported most frequently by teachers included posting schoolwork online, collaborating using online documents, collaborating online with students from other schools, and synthesizing information from online sources.

Surveyed teachers reported that the tools they used most frequently were in the categories of productivity tools, course management tools, personalized learning tools, and communication tools. Teachers reported frequent use of word processing software, presentation tools, and learning management systems. Thirty percent or fewer of the surveyed teachers reported frequent use of tools in the following categories: programming and analysis tools, simulations and educational games, and creativity tools. Teachers reported that creativity tools were the least frequently used.

Teachers indicated which software or technology tools they would use if they had access to them. Of the 43 individuals who identified a tool, over half mentioned some type of creativity tool. This suggests that less frequent use of creativity tools to date (and relatively less frequent student use of technology for creativity) may be due in part to lack of access.

Teachers had positive attitudes and beliefs about technology integration. Nine in 10 teachers agreed or strongly agreed that they were confident in their ability to integrate technology and that technology was useful for instruction. Nevertheless, we observed statistically significant declines in both areas in Year 2 relative to Year 1.

Section 6. Conditions Supporting Technology Integration

This section describes the different levels of school support for technology integration at Maine MLTI schools, primarily through profiles of eight schools. The purpose of these profiles is to understand three domains of school supports: technology infrastructure, leadership for technology integration, and professional learning for technology integration. Each domain comprises three different dimensions, as depicted in Exhibit 26. Appendix D provides a detailed description of the school profile methodology, definitions of framework dimensions, and domain scores for each school.

Exhibit 26. Framework of School Supports for Technology Integration

Domain	Dimension
Technology infrastructure	Connectivity and capacity
	Digital tools for teaching and learning
	Access to effective and efficient technical support
Leadership for technology integration	Shared vision
	Culture of innovation
	Professional learning for school leaders
Professional learning for technology integration	Job-embedded professional development for teachers
	Collaboration and community
	Systemic support for professional learning

Based on the qualitative data, AIR analysts assigned each school to a level from 0 to 2 (low to high) for each dimension in a domain. After assigning dimension levels, we summed the dimension levels to reach a domain score. For each of the three domains (which comprised three dimensions), the possible scores ranged from 0 to 6. For each domain, we then categorized schools into groups that exhibited low levels of support for a domain (school domain score between 0 and 3) or high levels of support for a domain (school domain score between 4 and 6). Within each domain, we identified major themes among schools with high or low levels of support, respectively. Through this process, we identified patterns in how schools support integration of technology.¹³

Technology Infrastructure

The technology infrastructure domain contains the dimensions of connectivity and capacity, digital tools for teaching and learning, and technical support. This domain focuses on schools providing dependable Wi-Fi connectivity and up-to-date software for teachers and students, as well as efficient and effective technical support (see Box 1). Based on their domain-level scores, five of the eight schools had high levels of technology infrastructure (scores of 4 or above) and the remaining three schools had low levels

¹³ In our analysis, we compared the scores of the four schools that completed a teacher focus group and the four schools that did not. There were no significant differences in scores between the two groups of schools.

(scores of 3 or below). Exhibit 27 provides the eight schools' dimension and domain levels for technology infrastructure. We provide further details about schools with high and low levels of technology infrastructure below.

BOX 1. DIMENSIONS WITHIN THE TECHNOLOGY INFRASTRUCTURE DOMAIN

Dimension	Definition
Connectivity and capacity	The network provides dependable connectivity for all students and staff to access varied digital learning tools and online resources at the same time. Student safety and privacy are protected, while still allowing students and teachers to explore online environments and digital tools without unwarranted restrictions.
Digital tools for teaching and learning	Teachers and students have up-to-date hardware and software for teaching and learning (e.g., learning management system, e-portfolio system, assessment system, portal learning object repository, and collaborative tools). Teachers and administrators participate in decision making about software purchases. Teachers can request purchase and installation of software as needed.
Technical support	The school has access to a staff member with dedicated time to address technical issues encountered by staff and students. Technical support is timely, effective, and efficient.

Exhibit 27. Domain and Dimension Levels for the Technology Infrastructure Domain

School	Rating for connectivity and capacity	Rating for digital tools for teaching and learning	Rating for technical support	Domain level for technology infrastructure
Schools with high domain scores				
School A	2	2	2	6
School C	2	2	2	6
School E	2	2	2	6
School F	2	2	2	6
School H	2	2	2	6
Schools with low domain scores				
School B	2	0	1	3
School D	1	1	1	3
School G	1	1	1	3

Note. Dimension levels ranged from 0 to 2. Domain levels ranged from 0 to 6.

Schools With High Levels of Technology Infrastructure

In the five schools with high domain scores for technology infrastructure, staff described high levels of connectivity and capacity, availability of digital tools for teaching and learning, and access to effective technical support.

- **Connectivity and capacity.** Staff at these five schools stated that the school provided dependable Wi-Fi in all classrooms. For example, the technology coordinator from School E stated that the school had a “good wireless system” and that connectivity was “not one of the issues that we have.” These schools also used online tools and apps to protect student safety and privacy while online. Staff from four of these schools described software used to monitor the appropriateness of online content, such as GoGuardian, Lightspeed Relay, and Securely. Staff from these four schools also stated that security protections did not usually impede classroom learning.
- **Digital tools for teaching and learning.** Staff at these five schools reported that teachers and students had up-to-date software, and teachers could easily request new software as needed. For example, teachers from School E stated that their software was all up to date, and that the school IT department was quick to replace and update any digital tools: “Our [IT Staff] does a very good job of when a system or a computer is starting to get old, he will start to look to replace them.” Similarly, the technology director from School C described a straightforward process for teachers to request new software from the district.
- **Access to effective and efficient technical support.** Staff at these five schools described having access to a staff member with dedicated time to address technical issues in a timely and effective manner. For example, the technology coordinator from School F stated that the school used a “technology ticket system” to address technology issues, and that either the technology coordinator or the librarians responded to problems. Teachers from School E stated that technical assistance happens “immediately or [by] the end of the day.” Nevertheless, technology coordinators from four of the five schools mentioned that adding more IT staff would improve their ability to provide effective and efficient technical support.

Schools With Low Levels of Technology Infrastructure

In the three schools with low domain scores for technology infrastructure, staff described medium or high levels of connectivity and capacity, medium or low levels of availability of digital tools for teaching and learning, and medium levels of access to effective technical support.

- **Connectivity and capacity.** Staff at these three schools described medium (Schools D and G) and high (School B) levels of connectivity and capacity. Staff at Schools D and G reported frequent interruptions to internet service. For example, teachers at School G stated that the Wi-Fi connection varied based on classroom location, and the technology coordinator reported that they had Wi-Fi outages “maybe once every couple of weeks.” (They described this as an improvement over previous years.) Staff at these schools described digital citizenship training for students and the use of device monitoring software.

- **Digital tools for teaching and learning.** Staff at these three schools described medium (Schools D and G) to low (School B) levels of availability of tools for teaching and learning. Staff described software and devices that were out of date. For example, staff at School D stated that there was a process to update student devices at the end of the school year but not all devices were updated, which led to both hardware and software issues. Similarly, teachers from School B reported that they did not have up-to-date software, and that trying to upgrade their systems themselves caused their devices to work less efficiently. Staff described difficult processes for requesting new technology. For example, the technology coordinator at School B reported that there were difficulties within the request process, primarily due to a change in district personnel.
- **Access to effective and efficient technical support.** Staff at these three schools described medium levels of technical support. Staff from these schools described technical support staff who were not located at their school, which caused delays and left teachers and students without immediate access to technical support when needed. For example, teachers at School B noted some issues with receiving technical support. They described the IT department as being “as responsive as they can be” but reported that the technology coordinator was not always based within the school. Staff at School D described a support staff with competing duties (i.e., teaching), leading staff to describe the technical support as inadequate. Staff from all three schools expressed an opinion that having full-time, school-based IT staff would improve technical support.

Leadership for Technology Integration

The leadership for technology integration domain (henceforth, leadership domain) comprises the following dimensions: a shared vision, a culture of innovation, and professional learning for school leaders (see Box 2). To evaluate these dimensions, we asked school staff to describe the extent to which school leaders developed and shared a formal vision or plan for technology use, encouraged teachers to experiment with technology, and participated in professional learning focused on leading technology initiatives. One school had high levels of leadership for technology integration (a score of 4 or above) and the remaining seven schools had low levels of leadership (scores of 3 or below). Within the shared vision dimension, there was a range of ratings (high, medium, and low) across schools. Within the culture of innovation dimension and the professional learning for school leaders dimension, all schools received ratings of either medium or low. Exhibit 28 presents the eight dimension and domain ratings for leadership.

BOX 2. DIMENSIONS WITHIN THE LEADERSHIP FOR TECHNOLOGY INTEGRATION DOMAIN

Dimension	Definition
Shared vision	The school has a formal, up-to-date vision and set of expectations for use of technology in teaching and learning. Teachers, students, and parents know about the vision, so there is a schoolwide understanding of it.
Culture of innovation	School leaders encourage a culture among teachers of experimenting with technology in their instruction. School staff engage in technology-related initiatives and share ideas about how to incorporate technology into learning, teaching, and school administration and operations.
Professional learning for school leaders	School leaders participate in professional learning that is focused on integrating technology into instruction. School leaders participate in professional learning about how to lead the development, implementation, and evaluation of schoolwide technology plans.

Exhibit 28. Domain and Dimension Levels for the Leadership Domain

School	Rating for shared vision	Rating for culture of innovation	Rating for leader professional development	Domain level for leadership
School with a high domain score				
School D	2	1	1	4
Schools with low domain scores				
School A	1	1	0	2
School B	0	1	1	2
School C	0	1	1	2
School E	1	1	0	2
School F	1	1	0	2
School G	0	0	0	0
School H	0	0	1	1

Note. Dimension levels ranged from 0 to 2. Domain levels ranged from 0 to 6.

School With a High Level of Leadership

School D was the only school where staff described a high level of leadership. Staff at this school described high levels of leadership with regard to promoting a shared vision, and medium levels of leadership with regard to promoting a culture of innovation and participating in professional learning for technology leadership.

- **Shared vision.** Staff at School D described a high level of leadership with regard to promoting a shared vision for technology use. They stated that the school had a “very extensive ... 5-year plan” around teacher and student use of technology. According to staff, the plan “talks about the various applications that we use [and] how we vet them. It talks about the devices that we use, and their lifecycle, the networks that we use and their lifecycle.” There were various stakeholders involved in the process of developing this plan, including teachers. The technology coordinator reported that involving teachers in the process helped to familiarize them with any new software or applications that they were expected to use in their classrooms, as well as informing them about the plan itself. The technology coordinator stated that there was a schoolwide expectation that teachers would use Google Classroom to “create assignments [and] to push out homework,” as well as give and receive student feedback.
- **Culture of innovation.** Staff at school D described medium levels of leadership with regard to promoting a culture of innovation. The technology coordinator stated that the school fostered an environment in which teachers experimented with new technologies: “teachers and administrators often bring new programs that they’d like me to vet or to try.” However, staff provided few examples of teacher involvement in technology-related initiatives.
- **Professional learning for school leaders.** Staff at School D described medium levels of leadership with regard to participation in professional learning for technology leadership. The technology coordinator reported attending many workshops, including an annual weeklong workshop on the PowerSchool learning management system. The technology coordinator also stated that they attended conferences on the use of Google Suite. They did not mention professional development that other school leaders participated in, but they believed these leaders could benefit from learning about device management.

Schools With Low Levels of Leadership

The remaining seven schools scored in the low range for the leadership domain, receiving a domain score of 3 or below. Staff at these schools described medium to low levels of leadership with regard to promoting a shared vision, promoting a culture of innovation, and participating in professional learning for technology leadership.

- **Shared vision.** Schools with low scores in the leadership domain had staff who described medium (Schools A, E, and F) and low (Schools B, C, G, and H) levels of leadership with regard to promoting a shared vision. Staff at five of the seven schools stated that their school did not have a formal technology plan or vision for technology use. For example, teachers at School B stated that there were no formal expectations around technology use, but rather that it was “up to the individual ... there [is not] anything schoolwide.” Staff at two schools stated that their school had a technology plan, but that it lacked specificity or had not recently been updated. For example, the technology coordinator at School E stated that the school had a technology plan

but it had not been updated since before the Covid-19 pandemic. The technology coordinator at School F reported that the school used the Maine DOE and MLTI plans, which were shared with staff at meetings, but did not mention any vision tailored specifically for the school.

- **Culture of innovation.** Among the seven schools with low domain scores for leadership, five schools (Schools A, B, C, E, and F) had staff who described medium levels of leadership with regard to promoting a culture of innovation, while staff at two schools (Schools G and H) described low levels of leadership. Staff at Schools G and H stated that school leaders did not strongly encourage experimentation with technology. For example, staff at School G reported that encouragement to experiment with technology came more from teachers than school administration. Staff at other schools (Schools B, C, and F) reported encouragement from administration to experiment with technology but did not provide specific examples. For example, the technology coordinator at School F stated only that they “are always trying new things.” Across the seven schools, no staff described involvement in technology-related initiatives.
- **Professional learning for school leaders.** Among the seven schools with low scores for the leadership domain, staff at three schools (Schools B, C, and H) described medium levels of leadership with regard to participating in professional learning for technology leadership, while staff at four schools (Schools A, E, F, and G) described low levels. Staff at three schools (Schools A, E, and F) provided no examples of school leader participation in professional learning. Staff at the other four schools (Schools B, C, H, and G) provided some examples of professional development for school leaders, primarily for the technology coordinator. For example, the technology coordinators at Schools C and H stated that they attended the Association of Computer Technology Educators of Maine conference on an annual basis. Similarly, the technology coordinator at School B stated that they had taken classes at different colleges. Although these staff provided some examples of professional learning, they were not specific to leadership of technology initiatives and were focused mainly on learning about new tools.

Professional Learning for Technology Integration

The professional learning domain comprises the dimensions of job-embedded professional development, collaboration and community, and systemic support for professional learning (Box 3). To evaluate these dimensions, we asked school staff to describe the extent to which technology-focused professional learning aligned with their day-to-day instructional tasks and curricular goals, whether teachers engaged in formal collaboration and inquiry activities, and whether there were systems and structures to support professional learning. Of the eight schools profiled, two scored in the high range for the professional learning domain and the remaining six scored in the low range. All schools had staff who described medium levels of collaboration and community. Staff described low, medium, and high levels of job-embedded professional development and support for professional learning. Exhibit 29 provides the eight schools’ dimension and domain levels for professional learning for technology integration.

BOX 3. DIMENSIONS WITHIN THE PROFESSIONAL LEARNING DOMAIN

Dimension	Definition
Job-embedded professional development	Teachers participate in professional learning about technology that is ongoing throughout the year and during the school day (leveraging existing school routines) and is focused on the curricular needs of teachers. Teachers can select opportunities that align with their day-to-day, ongoing needs. Just-in-time learning resources are available to address emergent needs.
Collaboration and community	Local teams of teachers collaborate on using technology and conduct shared inquiries into student learning to identify effective uses of technology and to identify or develop digital learning resources.
Systemic support for professional learning	Contracts, calendars, daily schedules, and incentive and evaluation systems support professional learning and collaboration. Teachers have significant and regular protected time for professional learning and collaboration, as well as the necessary role flexibility and autonomy to improve and innovate.

Exhibit 29. Domain and Dimension Levels for the Professional Learning Domain

School	Rating for job-embedded professional development	Rating for collaboration and community	Rating for systemic support for professional learning	Domain level for professional learning
Schools with high domain scores				
School A	2	1	2	5
School F	1	1	2	4
Schools with low domain scores				
School B	1	1	0	2
School C	1	1	1	3
School D	1	1	1	3
School E	0	1	2	3
School G	0	1	0	1
School H	1	1	0	2

Note. Dimension levels ranged from 0 to 2. Domain levels ranged from 0 to 6.

Schools With High Levels of Professional Learning

In the professional learning domain, two of the eight schools had high domain scores. Staff at these schools described medium or high levels of job-embedded professional development, medium levels of collaboration and community, and high levels of systemic support for professional learning.

- **Job-embedded professional development.** Staff at these two schools described medium (School F) to high (School A) levels of job-embedded professional development. Staff at both schools described ongoing professional development that provided some choice in terms of topic to meet teachers' curricular needs, although options were not always aligned with the day-to-day needs of teachers. For example, teachers at School A stated that there were 2 to 3 hours set aside every month for teacher professional development, and there was sometimes a choice in what teachers could participate in depending on their needs. One teacher said, "sometimes [the professional development time] is set aside for something that's specific [to our goals] and other times it's more open-ended." However, it was not clear if the options provided were determined based on the curricular needs of teachers. The technology coordinator at School F also mentioned professional development days, during which teachers had some choice in professional learning opportunities. The technology coordinator went on to say that it was often teachers administering professional learning to other teachers, because the school used a train-the-trainer model, allowing teachers to receive training on a certain technology tool and then teach others how to use it.
- **Collaboration and community.** Staff at these two schools described medium levels of collaboration and community. Staff described both formal and informal collaboration among teachers to identify effective uses of technology to meet student needs. The technology coordinator at School F stated that the school hosted "lunch and learns," which were described as opportunities when librarians "could answer [teachers'] tech questions." Teachers at School A described informal collaboration between teachers, saying, "we help each other." There were no examples shared from either school about teachers conducting formal inquiries on how to use technology.
- **Systemic support for professional learning.** Staff at these two schools described high levels of systemic support for professional learning. These schools offered designated time built into the school calendar that was dedicated to professional learning. For example, teachers at School A stated that they had monthly early release days, which allowed for several hours dedicated to professional development. The technology coordinator at School F reported that time for professional development was built into their school calendar as well, and that the school had "PD afternoons" monthly. The technology coordinator at School F also stated that teacher participation in professional development played a role in teacher evaluations.

Schools With Low Levels of Professional Learning

In the professional learning domain, six of the eight schools received scores in the low range, indicated by a domain score of 3 or below. Staff at these schools described low to medium levels of job-embedded professional development, medium levels of collaboration and community, and low to medium levels of systemic support for professional learning.

- **Job-embedded professional development.** Staff at these six schools described medium (Schools B, C, D, and H) to low (Schools E and G) levels of job-embedded professional development. These schools offered limited professional learning opportunities to teachers, and those opportunities were rarely related to teachers' curricular needs. For example, teachers from School G described having few professional development opportunities, limited to 3 to 4 in-service days per year.
- **Collaboration and community.** All six schools with scores in the low range for the professional learning domain had staff who described medium levels of collaboration and community. Findings from these schools were similar to the two schools with high domain scores.
- **Systemic support for professional learning.** Staff at these six schools described low (Schools C and D), medium (Schools B, G, and H), and high (School E) levels of systemic support for professional learning. Staff from all six schools reported that there was some amount of time designated in the school calendar for professional development, although the number of days varied across schools. Staff at two of the schools (Schools B and G) reported that the school reimbursed teachers for courses or trainings they took that were not offered by the school. When discussing support for enrolling in other professional development opportunities, teachers at School B stated, "we're encouraged, we're allowed to take classes, they reimburse us for classes. So, obviously they're supportive of that, which is nice."

Summary

In the technology infrastructure domain, five schools had staff who described high levels of infrastructure and three schools had staff who described low levels of infrastructure. The schools in the high range had staff who described having dependable wireless connectivity, access to up-to-date software and digital learning tools, and efficient technical support. The schools in the low range for this domain had staff who described less dependable Wi-Fi throughout the school, devices and software that were outdated (with complicated processes for requesting updates), and technical support that was not timely. Scores across all three dimensions were relatively similar, and all schools tended to have consistent scores across dimensions. Given that the majority of schools were in the high range for this domain, technology infrastructure appears to be the strongest of the three domains of school supports.

Most schools (seven of eight) had low levels of leadership for technology integration. A majority of these did not have a formal vision for technology use and had limited school leader participation in professional learning opportunities. Staff at a majority of schools (six of eight) described medium levels of leadership with regard to a culture of innovation. While schools did not tend to have a formal vision for technology use, teachers did, overall, feel encouraged by their colleagues to experiment with technology. However, this encouragement was not tied to specific goals or initiatives within the schools and did not typically come from school administrators.

Staff at two schools described high levels of professional learning for technology integration, while staff at the remaining six schools described low levels. Schools with high levels provided more professional learning opportunities that were sometimes related to teachers' ongoing curricular needs and had more systemic support for professional learning, mainly time built into the school day and calendar for

professional development. Schools with low levels had fewer to no opportunities for professional learning focused on teachers' needs. Schools in both the high and low ranges reported similar examples of collaboration and community, demonstrating that schools were providing opportunities (although they were mostly informal) for teachers to work together to use technology tools to meet student needs. The lowest scoring dimension was job-embedded professional development. This highlights a need for schools to provide ongoing professional learning about technology, focusing on the curricular needs of teachers; and to provide opportunities for teachers to select professional learning that meets their needs.

Our findings suggest that most of the eight profiled schools have some supports in place across all three domains. Summing across the domains, most of the eight schools were clustered in the middle of the range, with overall scores of 7–13. Only one school had a low overall score of 4 (see Exhibit 30). Comparing across domains, the profiled schools tended to have high levels of technology infrastructure, a range of low to high levels of professional learning, and generally low levels of leadership for technology integration. These findings indicate that technology infrastructure is typically strong (and is not weak in any school); that schools are providing some support for professional learning for technology integration, although with room for improvement; and that most schools are not yet providing strong leadership for technology integration.

Exhibit 30. Domain and Overall Levels for Technology Integration Supports by School

School	Technology infrastructure	Leadership for technology integration	Professional learning for technology integration	Overall
School A	6	2	5	13
School B	3	2	2	7
School C	6	2	3	11
School D	3	4	3	10
School E	6	2	3	11
School F	6	2	4	12
School G	3	0	1	4
School H	6	1	2	9

Note. Domain scores can range from 0 to 6. Overall scores can range from 0 to 18.

Section 7. Discussion and Recommendations

Building on two decades of previous experience supporting 1:1 device allocation, MLTI 2.0 seeks to expand access to digital devices across a broader range of grades than the previous version of the initiative, provide high-quality professional learning in support of digital learning and technology integration, and support robust school technology infrastructure in schools throughout the state. The Year 2 evaluation of MLTI 2.0 focused on providing feedback to Maine DOE on implementation of the initiative's components, the ways in which teachers and students are using technology resources provided by MLTI 2.0 or otherwise, and supports or resources that would be useful for promoting technology integration. The evaluation used statewide extant data, data from teacher and student surveys in a representative sample of 27 schools, and data from interviews and focus groups with administrators and teachers at eight purposively sampled schools participating in both years of the evaluation. This section discusses the evaluation's findings and makes recommendations to MLTI based on those findings.

MLTI continued to largely succeed in its goal of providing devices to students and educators on a one-to-one basis. Nine in 10 schools distributed one device per student, and seven in 10 distributed one device per educator. Moreover, a larger percentage of schools completed distribution early in the 2022–23 school year, compared with the 2021–22 school year. By October, more than eight in 10 schools had completed student device distribution, and about three quarters of schools had completed educator device distribution. Furthermore, fewer schools reported issues with receiving and distributing devices this year, compared with last year. These findings indicate that MLTI 2.0 improved its process for getting devices to schools, and that schools were more successful in distributing devices early in the school year. Based on these findings, the initiative was within 1–3 percentage points of meeting the three milestones for device allocation and distribution:

- Ninety-four percent of MLTI schools received 1:1 devices for students, and 72% received 1:1 devices for educators (criterion: 95% of schools for students and educators).
- Ninety-three percent of MLTI schools distributed 1:1 devices to students, and 84% distributed 1:1 devices to staff (criterion: 95% of schools for students and educators).
- Eighty-seven percent of MLTI schools distributed 100% of devices to students by October 1, and 75% distributed 100% of devices to educators by October 1 (criterion: 90% of schools).

The proportion of schools that received educator devices on a one-to-one basis was 22 percentage points lower than the proportion that received student devices on a one-to-one basis. The data suggest that, in part, this was due to 17 schools ordering but not receiving devices for educators. However, very few schools made complaints about the process for receiving devices. It is possible that educators had older devices and did not feel they needed the new devices that had been ordered. We recommend that MLTI assess whether this assumption is accurate.

Recommendation: Consider establishing a process for determining if there is an unmet need for additional or updated educator devices. If there is an unmet need, address it in collaboration with schools where that need exists.

MLTI produced many resources for professional learning opportunities, and the survey data suggest that about half of teachers participated in some type of MLTI-developed professional learning opportunity. Based on a review of professional learning materials, MLTI produced 150 online professional learning resources. Among participants who completed surveys after in-person events or self-paced learning, most reported that they agreed or strongly agreed that the professional learning opportunity was useful. Data from teachers in the teacher survey sample suggest that about half of the teachers in MLTI schools participated in some type of MLTI-provided professional learning opportunity, and nearly all MLTI schools had at least one teacher who participated in some type of MLTI professional learning opportunity. Over one quarter of teachers indicated that they participated in online events or self-paced online learning, while about 10 percent or fewer indicated that they participated in hybrid events or coaching. The digital ambassador logs, however, recorded a much lower proportion of teachers participating in these professional learning formats (although there were no logs or any other extant data for participation in self-paced online learning).

Based on these findings, the initiative exceeded the milestones related to professional learning:

- MLTI staff developed between four and 65 online professional learning resources in each of the 10 topic areas for a total of 150 resources (criterion: at least four resources in each of five topic areas, for a total of at least 20 resources).
- Ninety-two percent of MLTI schools participated in online or in-person professional learning opportunities (criterion: 80% of schools).
- Between 88% and 93% of educators agreed that the training was useful for their work (criterion: 80% of teachers).

There is evidence that schools varied considerably in the extent to which they supported professional learning related to technology. Staff at two of the eight profiled schools described high levels of professional learning in support of technology integration, characterized by systemic support for professional learning that was often job embedded (i.e., related to teachers' curricular needs). However, staff at the remaining six schools described infrequent professional learning opportunities that were not typically job embedded. Staff at all eight schools described medium levels of collaboration, occurring both informally and in more formal structures (e.g., "lunch and learns"). Among surveyed teachers, about half indicated that they encountered barriers to participating in professional learning opportunities. About a third of surveyed teachers saw lack of relevance as a barrier to participation.¹⁴ A similar proportion of surveyed teachers stated that lack of time was a barrier to participation.

¹⁴ It should be noted that teacher survey items about barriers to participation were about professional learning from any source.

Recommendation: Based on the findings about participation in MLTI professional learning opportunities and the level of school supports, we suggest that a major focus of MLTI next year is making the professional learning component stronger for teachers and administrators.

- Consider a need-sensing process for identifying professional learning topics on teaching and learning with technology that are in high demand among MLTI schools in order to better target MLTI efforts to develop and provide professional learning. Maine DOE may also consider developing a learning management system that assists with tracking teacher access to professional learning opportunities. The discrepancy between data from the teacher survey and data from the digital ambassador logs on participation in MLTI professional learning opportunities deserves further investigation.
- Consider how to address the barriers that teachers encountered to participating in technology-focused professional learning. To enhance the perceived relevance of professional learning, consider developing professional learning opportunities focused on specific subject areas (e.g., using technology in alignment with science standards). To address the perceived lack of time to participate in professional learning, MLTI may also consider ways to help schools and districts incorporate professional learning into existing school routines and structures.

Little evidence was found of school leadership support for technology in profiled schools. We categorized seven of the eight profiled schools as having low levels of leadership support for technology. Within this group, staff described either medium or low levels of leadership with regard to promoting a shared vision for technology use, promoting a culture of innovation, and participating in professional learning for technology leadership.

Recommendation. Extend the MLTI approach to professional learning to include opportunities for school administrators. For example, MLTI may consider developing a self-paced learning series focused specifically on the knowledge and skills for leading technology integration (such as setting a vision, alleviating barriers to teacher participation in professional learning, and ensuring an adequate technology infrastructure). MLTI also may consider providing incentives for leaders to participate in these learning opportunities.

Infrastructure support was well received among those schools that participated, but relatively few schools participated. Data from MLTI infrastructure specialist records and logs showed that IT support site visits were conducted at 14 schools, and that 13 schools were reached for IT support through conferences and presentations. All IT staff reported that they were satisfied or very satisfied with the support provided during site visits. Based on these findings, the initiative met all milestones related to infrastructure support:

- The state infrastructure specialist conducted four presentations (criterion: four presentations).
- The state infrastructure specialist conducted 14 site visits (criterion: 14 site visits).
- One hundred percent of IT staff who received IT support stated that the support was useful (criterion: 80%).

While these numbers meet the goals set this year for this program component, they represent few of the overall MLTI schools.

In the majority of profiled schools (five of eight), staff described high levels of technology infrastructure. This was indicated by dependable wireless connectivity, prompt technical support, and devices with up-to-date software. In three of the eight schools without high levels of technology infrastructure, schools typically had medium levels of technology infrastructure across these three dimensions. School staff noted that technical support was not consistently available, wireless connectivity was not always dependable, and devices did not always receive timely software updates. Access to technology infrastructure therefore appears to be relatively strong compared with the other two domains of school supports – leadership and professional learning – although it is not consistently high across schools.

Recommendation: MLTI may consider either expanding the goals for the infrastructure support component to reach a larger number of MLTI schools, or developing a process to focus current resources on schools where this support is most needed. The variation in levels of technology infrastructure (indicated by the school profiles) suggests the importance of identifying schools most in need of technology infrastructure support.

Teachers frequently used technology to prepare instruction, manage the classroom, and provide opportunities for student-centered learning. At least three quarters of students indicated that, across all their classes, teachers frequently asked them to use technology for communication, collaboration, creativity, and critical thinking. The majority of surveyed teachers used technology on a daily or almost daily basis, both for supporting instruction and for classroom management and communication. In addition, around three fifths of surveyed teachers frequently asked students to use technology for communication, collaboration, and critical thinking. Slightly fewer than half reported that they frequently asked students to use technology for creativity. Surveyed teachers reported that the tools they used most frequently were in the categories of productivity (particularly word processing and presentation software), course management, and communication tools. In contrast, about one fifth of teachers used creativity tools at least monthly. Moreover, surveyed teachers most frequently mentioned creativity tools when asked which computer applications they would like to use if they had access to them.

Recommendation: Given that a majority of teachers are providing opportunities for students to use technology for student-centered learning, MLTI may consider identifying and publicizing successful uses of technology among teachers. Teachers indicated relatively less frequent use of creativity tools and an interest in greater access to these tools, so MLTI may also consider exploring possibilities for facilitating purchasing of these tools. MLTI may also consider identifying specific professional learning needs related to creativity tools.

Most teachers were confident in their ability to use technology for instruction and believed that technology was useful for instruction. This indicates a very strong base of support upon which

professional learning efforts can build, and suggests that teacher attitudes are (at the very least) not inhibiting teacher implementation of technology integration.

Recommendation: Collect data to test possible explanations for decreases in teachers' confidence in using technology and in the strength of their beliefs in the usefulness of technology.

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Appendix A. Summary of Milestones

Exhibit A1. Maine Learning Technology Initiative (MLTI) Milestones and Completion Status

Program Component	Milestone	Actual	Criteria Reached?
Access to technology	Ninety-five percent of MLTI schools receive 1:1 devices for students and educators (based on allocation and current enrollment).	Ninety-four percent of MLTI schools received 1:1 devices for students and 72% of MLTI schools received 1:1 devices for educators (based on allocation and current enrollment).	No
	Ninety-five percent of MLTI schools distribute 1:1 devices to students and educators (based on allocation and current enrollment).	Ninety-three percent of MLTI schools distributed 1:1 devices to students, and 84% of MLTI schools distributed 1:1 devices to educators (based on allocation and current enrollment).	No
	Ninety percent of MLTI schools distribute 100% of their student and educator devices by October 1.	Eighty-seven percent of MLTI schools distributed 100% of their student devices by October 1, and 75% of MLTI schools distributed 100% of their educator devices by October 1.	No
Access to professional learning opportunities	Develop at least four resources across five topic areas (20 total).	Between four and 65 online resources in each of 10 topic areas were developed (150 total).	Yes
	Eighty percent of MLTI schools participate in professional learning opportunities.	Ninety-two percent of surveyed schools participated in MLTI professional learning opportunities.	Yes
	Eighty percent of teachers at MLTI schools agree or strongly agree that the MLTI professional development is useful.	Between 88% and 93% of educators agreed or strongly agreed that the training was useful to their work.	Yes
Access to infrastructure	The state infrastructure specialist conducts four presentations.	The state infrastructure specialist conducted four presentations.	Yes
	The state infrastructure specialist conducts 14 site visits.	The state infrastructure specialist conducted 14 school site visits.	Yes
	Eighty percent of IT staff who receive IT support are satisfied or very satisfied with the support received.	One hundred percent of IT staff who received support were satisfied or very satisfied with the support received.	Yes

Note. All MLTI 2.0 schools reached the threshold of offering 1 gigabyte per second in 2022–23. Because all schools in the program reported that they had reached the current target for network bandwidth set by the Maine Department of Education, analyses of these data were not conducted this year.

Appendix B. Total Devices Received and Time to Receive Devices, by Device Type

Exhibit B1. Number of Schools Receiving Devices of Each Type, and Number of Devices Received of Each Type

Device Type	Number of Schools That Received This Device Type		Number of Devices Received	
	Student devices	Educator devices	Student devices	Educator devices
Apple MacBook Air	48	54	2,881	567
Apple iPad Generations 8 and 9	50	36	3,765	458
CTL Convertible Chrome Laptop	65	26	6,746	418
Dell Chromebook 3100	15	0	844	0
Dell Latitude 5320	2	8	40	55
WCA Windows HP ProBook	3	8	63	62
No devices	0	51	0	0
Total	183	183	14,339	1,560

Note. Sample is limited to the 183 schools that responded to the Device Deployment Survey. Data are from the Maine Department of Education's Device Deployment Survey.

Appendix C. Survey Protocols

Teacher Survey Protocol

Introduction

1. Which school do you currently work at?

*[Required. Single select; response options: Drop down menu of MLTI schools and “*Other school not on list”]*

2. What grade(s) do you currently teach?

[Required. Multi-select; response options: Kindergarten, 1st grade, 2nd grade, 3rd grade, 4th grade, 5th grade, 6th grade, 7th grade, 8th grade]

3. Which of the following best describes your teaching role this year?

- a. I teach a specific subject area to multiple classes of students
- b. I teach multiple subjects to one class of students
- c. I do not have a teaching role

[If a is selected, skip next item. If c is selected, skip to end.]

4. Which subjects do you teach? (Select all that apply)

- a. Arts
- b. Career and technical education
- c. English language arts
- d. Math
- e. Physical education
- f. Science
- g. Social studies
- h. World languages

Professional development

The next four items ask about professional development you have received from *any* source.

5. How many total hours have you spent participating in *each* of the following professional development activities *focused on educational technology* during the past 12 months?

[Response option: Drop-down list of hours from 0 – 40 for each item]

- a. Formal, whole-group professional development (e.g., in-service days, professional development workshops, book study)
 - b. Formal, individualized or 1-on-1 professional development (e.g., mentoring, coaching, self-paced online courses)
 - c. Informal, self-organized professional development (e.g., podcasts, tutorial videos, communities of practice, blogs, social media)
6. Please indicate the extent to which you agree or disagree with the following statements about potential barriers to your participation in professional development focused on technology?
[Response options: 1 Strongly agree, 2 Agree, 3 Disagree, 4 Strongly disagree]
- a. My school does not provide released time to participate in professional development focused on technology.
 - b. I could not find professional development that is relevant to my needs.
 - c. The available professional development is of poor quality.
 - d. The professional development is not readily accessible to me.
 - e. Other (please describe)
7. What additional professional development focused on educational technology would you find most useful?
[Response option: Open response]

This item asks specifically about professional development provided by the Maine DOE/MLTI team.

8. The Maine Learning Technology Initiative 2.0 (MLTI 2.0) provides several types of professional learning opportunities. Which of the following MLTI 2.0 professional learning have you participated in this school year (select all that apply):
[Response option: Select all that apply]
- 1-on-1 coaching (virtual or in person) with an MLTI Ambassador
 - Online asynchronous series offering (e.g., multiple video recordings on a specific topic)
 - In-person group offering (e.g., conference presentation)
 - Online hybrid offering (e.g., book studies)
 - Other (please specify)

Use of technology in the classroom

9. How often do you use technology to do the following?
[Response options: Daily or almost daily, Weekly, Monthly, Less than monthly, Never]
- a. Creating handouts or instructional materials for students

- b. Developing lesson plans
 - c. Administering assessments
 - d. Delivering a presentation or direct instruction to the class
 - e. Entering or viewing grades
 - f. Entering or viewing results of student assessments
 - g. Entering or viewing attendance records
 - h. Communicate with students (e.g., email, instant messaging, etc.)
 - i. Sharing class announcements or assignments (e.g., with GoogleClassroom)
 - j. Communicate with parents (e.g., email, instant messaging, etc.)
10. How frequently do you ask a *majority* of your students to do the following?
[Response options: Daily or almost daily, Weekly, Monthly, Less than monthly, Never]
- a. Collaborate using online documents (e.g., Dropbox, Google Docs)
 - b. Collaborate online with classmates (e.g., group projects)
 - c. Collaborate online with students at other schools (e.g., service projects, science fairs)
 - d. Collaborate online with you (e.g., provide formative feedback)
 - e. Post schoolwork online (e.g., use Google Classroom or Padlet)
 - f. Use web tools to find online information (e.g., Twitter, news feeds)
 - g. Write for an online audience (e.g., reviews, blog posts, comments)
 - h. Give and receive feedback digitally from classmates
 - i. Give and receive feedback digitally from someone outside the school (e.g., an outside expert, a student in another class or school)
 - j. Chat online (e.g., Skype, Google Hangout, FaceTime)
 - k. Use a phone to capture visual information (e.g., a picture or a movie)
 - l. Develop multimedia presentations using technology
 - m. Create art, music, movies, or webcasts using technology
 - n. Create online models, simulations, graphic representations, or animations
 - o. Determine the reliability of information from websites
 - p. Synthesize information from online sources
 - q. Take measurements or do experiments using technology
 - r. Solve authentic problems using technology
 - s. Analyze data using technology

Supports for the use of technology in the classroom

11. Is your school able to provide you with the following support for technology use:

[Response options: 1 Almost always, 2 Usually, 3 Sometimes, 4 Rarely, 5 Not applicable]

- a. Access to high-speed internet
- b. Consistent access to wi-fi
- c. Prompt assistance with technology problems that disrupt instruction
- d. Support for computer device operation (e.g., desktops, laptops, or tablets)
- e. Access to instructional software and tools

12. Please indicate about how often you use the following software or applications with your students.

[Response options: Daily or almost daily; Weekly; Monthly; Less than monthly; Don't use]

- a. Video or photography editing software (e.g., iMovie)
- b. Music production and editing software (e.g., GarageBand, Anchor.fm)
- c. Word processing software (e.g., Word, Google Docs)
- d. Presentation tools (e.g., PowerPoint)
- e. Data processing tools (e.g., Excel)
- f. Virtual communication tools (e.g., Zoom)
- g. Online discussion forums (e.g., Flipgrid, iNaturalist)
- h. Behavior management software (e.g., ClassDojo)
- i. Geography or mapping software (e.g., Google Maps)
- j. Learning management systems (e.g., Google Classroom)
- k. Online lessons for “flipped classroom” approach (e.g., Khan Academy)
- l. Computer programming software (e.g., Scratch)
- m. Interactive assessment software (e.g., Poll Everywhere, Kahoot!)
- n. Software to support personalized and self-paced learning (e.g., Zearn, ASSISTments)
- o. Simulation software (e.g., Gizmos, PhET)
- p. Game-based software (e.g., Minecraft Education)
- q. Other (write in)

13. Are there any computer applications you would like to use if you had access to them? If so, please list them here.

The use of technology in the classroom

14. To what extent do you agree or disagree with the following statements?

[Response options: 1 Strongly agree, 2 Agree, 3 Disagree, 4 Strongly disagree]

- a. I can motivate students to use technology in a positive way.
- b. I can provide students with technology-based activities to exercise their knowledge and skills.
- c. I can provide students with technology-based activities related to my content area.
- d. Technology use in the classroom enhances student learning.
- e. I think that learning is more engaging when using technology.
- f. I want to learn more about effective technology use for teaching.

Student Survey Protocol

1. Which school do you go to?

[Required. Single select; response options: Drop down menu of MLTI schools and “Other school not on list”]

2. What grade are you in?

[Required. Single-select; response options: 6th grade, 7th grade, 8th grade, 9th grade]

The following questions ask how you feel about your classes.

3. How excited are you about going to your classes?

(1=Not at all excited, 2=Slightly excited, 3=Somewhat excited, 4=Quite excited, 5=Extremely excited)

4. How often do you get so focused on class activities that you lose track of time?

(1=Almost never, 2=Once in a while, 3=Sometimes, 4=Frequently, 5=Almost always)

5. In your classes, how eager are you to participate?

(1=Not at all eager, 2=Slightly eager, 3=Somewhat eager, 4=Quite eager, 5=Extremely eager)

6. When you are not in school, how often do you talk about ideas from your classes?

(1=Almost never, 2=Once in a while, 3=Sometimes, 4=Frequently, 5=Almost always)

7. Overall, how interested are you in your classes?

(1=Not at all interested, 2=Slightly interested, 3=Somewhat interested, 4=Quite interested, 5=Extremely interested)

The following question asks about how you use technology in your classes.

8. How often do your teachers ask you to do the following in any of your classes?

[Response options: Every day or almost every day, About once a week, About once a month, Less than once a month, Never]

- a. Work together using online documents (for example, Dropbox, Google Docs)
- b. Work together online with classmates (for example, group projects)
- c. Work together online with students at other schools (for example, service projects, science fairs)
- d. Work together online with your teacher (for example, get feedback)

- e. Post schoolwork online (for example, use Google Classroom or Padlet)
- f. Use online tools to receive information (for example, Twitter, news feeds)
- g. Write for people online (for example, blog posts, comments)
- h. Receive electronic feedback from classmates
- i. Receive electronic feedback from someone outside the school (for example, a real-world expert, a student in another class or school)
- j. Chat online (for example, Skype, Google Hangout, FaceTime)
- k. Use a phone to capture media (for example, photo or video)
- l. Develop presentations with text, pictures, video, and/or music using technology
- m. Create art, music, movies, or webcasts using technology
- n. Create online animations, diagrams, or simulations of real-world events
- o. Determine if information from websites is true or not
- p. Combine information from online sources
- q. Take measurements or do experiments using technology
- r. Identify and solve real-world problems using technology
- s. Collect and analyze data using technology

Appendix D. School Profile Methodology and Findings

We created profiles of eight schools—based on interviews and focus groups with staff—to understand how school staff perceive their schools’ leadership, professional learning, and technology infrastructure as supports for integrating technology. We created a detailed school technology integration support framework to describe schools’ level of support for technology integration in the domains of leadership, professional learning, and technology infrastructure.

School Sample

In Year 1, we sampled eight schools from a list of all Maine public schools that participated in the Maine Learning Technology Initiative (MLTI) provided by the Maine Department of Education (Maine DOE). Profile schools were purposefully selected from that set of schools, minus One of the responding schools had a missing value for distributing and so was excluded from analyses. selected to participate in the teacher survey. We randomly selected a single school from each of seven superintendent regions, and a single school from the combination of two other superintendent regions (i.e., York and Cumberland) with similar demographic and regional characteristics. Based on statewide distributions, the sample was balanced to have equal representation of schools from the lower two and upper two quartiles of the distribution of students eligible for free or reduced-price lunch, and a roughly proportional distribution of schools from city and suburban locales (two schools), town locales (two schools), and rural locales (four schools). In Year 2, we included these same eight school in both our survey and profile samples. One school in our original Year 1 sample did not respond to our request for participation. To find an alternate eighth school in Year 2, the MLTI team reached out to schools they had worked with in the past and identified a school that was willing to participate in the evaluation.

Data Collection and Analysis

The research team conducted virtual, approximately-45-minute video interviews with each school’s designated school technology leader, as well as virtual, approximately-45-minute video focus groups with teachers. Technology leader interviews and teacher focus groups focused on topics related to school leadership, professional learning, technology infrastructure, and use of technology. In total, the American Institutes for Research (AIR) conducted eight technology leader interviews and four teacher focus groups. We were unable to conduct a teacher focus group at four schools because teachers did not agree to participate in the focus group.

The AIR research team analyzed the qualitative data and identified common themes related to the three domains of the school technology integration support framework. Analysts then used these findings to determine schools’ level for each domain of the school technology integration support framework.

School Technology Integration Support Framework

AIR developed a school technology integration support framework to guide interview and focus group protocol development and qualitative data collection and analysis. This framework describes three major domains (and associated dimensions) of school-level processes that prior research indicates are critical for supporting technology integration. AIR used the Future Ready Schools Framework to guide the school profiles because the framework focuses on school conditions for supporting technology (Office of Educational Technology, 2016). In consultation with Maine DOE, we decided to focus on the subset of Future Ready Schools framework dimensions that aligned most closely with MLTI. Exhibit D1 depicts the domains and dimensions of the school technology integration support framework.

Exhibit D1. Domains and Dimensions of the School Technology Integration Support Framework

Domain	Dimension	Definition
Technology leadership for technology integration	Shared vision	The school has a formal, up-to-date vision and set of expectations for use of technology in teaching and learning. Teachers, students, and parents know the vision, so there is a schoolwide understanding of it.
	Culture of innovation	School leaders encourage a culture among teachers of experimenting with technology in their instruction. School staff engage in technology-related initiatives and share ideas about how to incorporate technology into learning, teaching, and school administration and operations.
	Professional learning for school leaders	School leaders participate in professional learning that is focused on integrating technology into instruction. School leaders participate in professional learning about how to lead the development, implementation, and evaluation of schoolwide technology plans and initiatives.
Professional learning for technology integration	Job-embedded professional development for teachers	Teachers participate in professional learning about technology that is ongoing throughout the year and during the school day (leveraging existing school routines) and is focused on the curricular needs of teachers. Teachers can select opportunities that align with their day-to-day, ongoing needs. Just-in-time learning resources are available to address emergent needs.
	Collaboration and community	Local teams of teachers (sometimes called professional learning communities) conduct

Domain	Dimension	Definition
		shared inquiries into student learning to identify effective uses of technology and to identify or develop digital learning resources.
	Systemic support for professional learning	Contracts, calendars, daily schedules, and incentive and evaluation systems support professional learning and collaboration. Teachers have significant and regular protected time for professional learning and collaboration, as well as the necessary role flexibility and autonomy to improve and innovate.
Technology infrastructure	Connectivity and capacity	The network provides dependable connectivity for all students and staff to access varied digital learning tools and online resources at the same time. Student safety and privacy are protected, while still allowing students and teachers to explore online environments and digital tools without unwarranted restrictions.
	Digital tools for teaching and learning	Teachers and students have up-to-date hardware and software for teaching and learning (e.g., learning management system, e-portfolio system, assessment system, portal, learning object repository, and collaborative tools). Teachers and administrators participate in decision making about software purchases. Teachers can request purchase and installation of software as needed.
	Access to effective and efficient technical support	The school has access to a staff member with dedicated time to address technical issues encountered by staff and students. Technical support is timely, effective, and efficient.

Based on the qualitative data, AIR analysts assigned each school to a level from 0 to 2 (low to high) for each dimension in a domain. The levels reflect each school's level of technology integration support:

- **A level of 0** indicates that interview and focus group participants provided little or no evidence of a dimension in their responses. Participants may not have agreed about the presence of the dimension at their school.
- **A level of 1** indicates that participants provided some evidence of a dimension in their responses. Participants may or may have not agreed about the presence of the dimension at their school.
- **A level of 2** indicates that participants provided extensive evidence of a dimension in their responses. Participants generally agreed about the presence of the dimension at their school.

After assigning dimension levels, we summed the dimension levels to reach a domain level. We weighted each dimension and domain equally in determining the levels because prior research indicates similar importance in technology integration, and because MLTI 2.0 weights these domains equally (Office of Educational Technology, 2016). For each of the three domains (which comprised three dimensions), possible scores ranged from 0 to 6. For each domain, we then categorized schools into groups that exhibited low levels of a domain (school domain score between 0 and 3) or high levels of a domain (school domain score between 4 and 6).

Exhibit D2 shows each school's level for each domain of the school technology integration support framework. Each school has been deidentified to protect the identities of interview and focus group participants.

Exhibit D2. Domain Levels for Technology Integration Supports by School

School	Locale	Percentage of Students Eligible for FRPL	Technology Infrastructure	Leadership	Professional Learning
School A	Town	65%	6	2	5
School B	Rural	66%	3	2	2
School C	City/suburb	42%	6	2	3
School D	Rural	48%	3	4	3
School E	Rural	64%	6	2	3
School F	City/suburb	47%	6	3	4
School G	Rural	12%	3	0	1
School H	Rural	27%	6	1	2

Note. FRPL is free or reduced-price lunch.

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