



# Wyoming Department of Education

## The Status of K-12 Digital Learning

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## Executive Summary

In January 2016, the Wyoming Department of Education (WDE) partnered with McREL International to support the development of a state Digital Learning plan<sup>1</sup>. The current evaluation report highlights findings from district staff, administrator, and teacher surveys; teacher and student virtual focus groups; and Listening Tour participant interviews and survey.

McREL received feedback on current and planned Digital Learning implementation strategies and perceptions of Digital Learning from the aforementioned data sources. These are discussed in detail throughout the body of this report and summarized in the Conclusion section. Key findings include the following:

- Teachers believed that Digital Learning is important for student success in a K-12 setting.
- Teachers indicated that professional development slightly increased the use of technology resources, gave them confidence to implement student Digital Learning, and helped them understand differentiated instructional strategies.
- District staff, administrators, and teachers reported that professional development on Digital Learning strategies for differentiated instruction, integrating technology resources, implementing blended learning, and understanding the importance of Digital Learning implementation would be beneficial for educators.
- District staff, administrators, and school staff are interested in networking (e.g., face-to-face meetings or events, online professional learning communities, district-hosted webinars).
- In addition to financial challenges, barriers to Digital Learning implementation include equipment needs, problematic internet connection, and availability of professional development opportunities.
- Teachers reportedly used a variety of devices (e.g., tablets, laptops, Smartboards, 3-D printers, etc.) and programs (e.g., IXL, PowerPoint, Google Docs, Kahoot!) for Digital Learning.
- Teachers talked of a digital divide among students, where students from disadvantaged backgrounds struggled to use technology in the classroom when compared to their peers. This divide has led to inequity for these disadvantaged students.
- Students expressed that they enjoyed using tablets, smart boards, laptops and computers. However, at times, they did want breaks from technology to have hands-on activities that do not involve devices.
- Students reported that technology skills are not well-defined in their school or classrooms, and they stated that teachers typically teach them about technology specific to an assignment or device used during class.
- Students generally felt confident in their abilities to use technology to complete assignments, work with other students, and learn new content. Students indicated that their teachers worked with them to improve their typing speed, mathematical proficiency and use of programs for class assignments.
- Listening Tour interview participants and survey respondents demonstrated strong investment in project goals and a desire to see the Digital Learning plan implemented.
- Listening Tour participants expressed the belief that it is essential to integrate technology into classroom instruction to prepare students for higher education and careers, as well as to support teachers in classroom management and engagement strategies.

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<sup>1</sup> The current study is an addendum to previously conducted evaluation by McREL for WDE on the State Education Technology plan.

## Introduction

By state statute, the Wyoming Department of Education (WDE) is required to develop and implement a statewide education technology plan ensuring equitable access to Digital Learning opportunities. A representative advisory panel was convened to guide this effort. Currently the advisory panel is working to develop a more comprehensive Digital Learning plan for education that not only addresses issues of access, but also delves deeper into what is needed to ensure Wyoming students have high quality Digital Learning experiences. They have identified the purpose for the plan as follows:

*...to provide a roadmap with recommendations for action focusing on digital learning which empowers all stakeholders to provide and expand learning opportunities, to be adaptable, and to evolve with the ever changing learning environment to meet the needs of all Wyoming students.*

WDE has partnered with McREL to build this Digital Learning plan. In order to assist in the development of this plan, WDE and McREL sought to collect stakeholder feedback from district staff, school administrators, teachers, students, and stakeholders. This includes facilitation of a listening tour, conducting surveys, facilitating focus groups, synthesizing feedback from stakeholders, and using the synthesis to inform the writing and editing of the plan.

## Survey Participants and Procedure

Three surveys were developed to assess district staff, school administrator, and teacher perspectives on Digital Learning in their districts and schools (refer to Appendix A). The surveys focused on district and school strategic planning for Digital Learning and technology use, interest in networking with others on student Digital Learning, online learning needs, barriers to implementing Digital Learning, and current and desired technology integration.

WDE distributed an anonymous survey link for district staff to complete via email. In addition, WDE also distributed anonymous survey links for school administrators and teachers to complete.<sup>2</sup> There are approximately 7,500 K-12 licensed teachers in Wyoming. A total of 540 teachers, representing 34 districts (representing 71% of school districts in Wyoming) and 104 schools, completed the survey for a seven percent response rate. Of the 368 administrators employed by WDE, 128 completed the online survey, resulting in a response rate of 35 percent. Respondents included administrators from 43 districts and 103 schools across WDE schools (representing 90% of all Wyoming districts). Additionally, 99 out of the 271 district staff in Wyoming completed a district-specific survey (37% response rate). These respondents represented 47 districts (representing 98% of districts in Wyoming). Response rates and district representation by group are shown in Table 1.

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<sup>2</sup> The evaluation team is unable to determine the actual number of individuals that received each survey; therefore, response rates are calculated based on the total number of individuals in each targeted group.

**Table 1. Survey respondents and response rates by group**

Survey Respondents	n (Responded)	N (Total)	% Responded	# of Districts Represented of 48
District Staff	99	271	36.5%	47
Administrators	128	368	34.8%	43
Teachers	540	7,500	7.2%	34

Note: WDE staff provided the total N for each group of the survey respondents via personal communication (i.e., e-mail).

Descriptive statistics are presented for each survey. In addition, tests for statistical significance were conducted using analyses of variance and/or Pearson’s Chi-Squares. Differences between participants’ responses to survey questions were examined by years of experience and position/area of focus. Further, median splits on district size, school size, and percentage of students eligible for free or reduced-price lunches were used to examine potential differences among participant responses. The criteria used to create the median splits can be reviewed in Table 2.

**Table 2. Median split variables for survey comparisons**

Split Variables		
<b>District Size</b>	<b>Small</b>	<b>Large</b>
	982 Students or Less	983 Students or More
<b>School Size</b>	<b>Small</b>	<b>Large</b>
	249 Students or Less	250 Students or More
<b>Free or Reduced-Price Lunch Eligibility</b>	<b>Low</b>	<b>High</b>
	34 Percent of Students or Less	35 Percent of Students or More

Due to the number of analyses conducted to find statistically significant results, only significant results are presented. Additionally, to control for family-wise error rates, where significant results may have been detected by chance rather than because of actual differences, corrections have been made.

### Focus Group Participants and Procedure

McREL researchers invited teachers and students in Wyoming public schools to participate in semi-structured conversations about their experiences with Digital Learning. Because focus groups are time-consuming, a representative sample of nine schools was selected. Selections were based on high or low school size, as well as high or low percentages of students eligible for free or reduced-price lunch. Schools were also divided into primary or secondary grade bands. Due to time constraints and school schedules, McREL facilitated a total of five elementary and two secondary school focus groups. A total of 30 teachers participated, with 23 participating at the primary and seven participating at the secondary level. A total of 24 students participated, with 18 students at the primary and six students at the secondary level.

Researchers connected with teachers and students virtually, using video conferencing. Both teachers and students were asked a series of 11 questions regarding Digital Learning at their schools. In student focus groups, a teacher or school staff member helped facilitate the focus groups by providing clarification on questions when needed. Focus group protocols are presented in Appendix B.

### *Listening Tour Participants and Procedure*

As part of the continuing effort to build the Digital Learning plan, a team from the WDE and the North Central Comprehensive Center (NCCC) visited ten towns in two and a half weeks to gather input from across the state regarding ideas and perceptions about what should go into a state Digital Learning plan and how the WDE should think about implementing the plan. More than 120 people representing 23 school districts attended sessions to share their insights and ideas about Digital Learning. In addition, more than 65 individuals representing 26 school districts responded to the questions online. Participants included parents, students, school board members, superintendents, technology directors, directors of curriculum and instruction, teachers, higher education representatives, business owners, and state legislators.

## Results

Data collected from the surveys are highlighted in the following sections. Through the *Results* subsections, descriptive statistics (i.e., mean [ $M$ ] and standard deviation [ $SD$ ]) were calculated to summarize participants' responses. Mean scores represent the average response values across participants. The standard deviation explains the spread of the numerical ratings around the mean. Higher mean scores are indicative of more positive outcomes or perceptions; scales are outlined in the body of the report as well as presented with each corresponding table. Additionally, values for items in which the number of respondents ( $n$ ) was less than four have been suppressed to preserve confidentiality. If an established scale was used and showed good reliability (Cronbach's  $\alpha \geq .60$ ), total scale means are presented.

Analyses of variance ( $F$ ) and Pearson's Chi squares ( $X^2$ ) (depending upon the scale of the item or item clusters) were used to test for statistical significance within district, administrator, and teacher survey responses. Only those which yielded statistically significant results are presented. To control for the chance of finding spurious results, corrections were made.

### Demographic information

Members from each group of respondents (i.e., district staff, administrators, and teachers) were asked to identify their roles, as shown in the following sections. Teachers were also asked to select their primary content area and their comfort level with using computers. All respondents reported the number of overall years in their role and the number of years at their current school or district, with each group given a range of options. The possible responses for years of experience ranged from (0) *less than a year* to (26) *more than 25 years* (25 years was the maximum number of years of experience participants could indicate); therefore, the average scores presented in Tables 3, 5, and 7 do not represent the exact average for respondents' years of experience.

#### District staff

Roles of participating district staff are presented in Table 3. The respondents included superintendents (20%), technology directors (21%), special education directors (15%), directors of curriculum and instruction (14%), and assistant superintendents (4%). Respondents were also able to provide a role other than those provided by selecting "other." The *other* roles identified by respondents varied and the sample size for each was less than four; therefore, the responses are not listed to maintain confidentiality.

**Table 3. Roles of district staff**

Role	n	%*
Superintendent	20	20.2%
Assistant Superintendent	4	4.0%
Technology Director	21	21.2%
Director of Curriculum and Instruction	14	14.1%
Special Education Director	15	15.2%
Other	25	25.2%

\*Percentages may not equal 100 due to rounding.

On average, respondents indicated they had worked in their current role and district for approximately seven and one-half years ( $M=6.56$ ,  $SD=7.08$ ), as shown in Table 4. Participants reported, on average, they have held their current role for eight years ( $M=7.91$ ,  $SD=7.08$ ). Respondents ranged from *less than a year* to *more than 25 years* for both their current role and total years of experience.

**Table 4. Experience in district role**

	n	M	SD
Number of Years in Role at Current District	99	6.56	6.32
Total Years in Role	99	7.91	7.08

### Administrators

Similarly, administrators reported their roles at their current school (see Table 5). A total of 126 administrators identified their role. The majority indicated that they were principals (79%). The remaining administrators reported that they were assistant principals (11%) or held a different role (10%) at their school.

**Table 5. Administrator roles**

Role	n	%*
Principal	100	79.4%
Assistant Principal	14	11.1%
Other	12	9.5%

\*Percentages may not equal 100 due to rounding.

The administrators reported holding their roles at their current school for a mean of four years ( $M=4.10$ ,  $SD=4.38$ ), as shown in Table 6. The respondents' years of experience at their current school ranged from *less than a year* to *22 years*. Administrators also reported that they held an administrator position, on average for a total of seven years ( $M = 7.25$ ,  $SD=6.82$ ).

**Table 6. Experience in administration**

	n	M	SD
Number of Years in Role at Current School	124	4.10	4.38
Total Years in Role	125	7.25	6.82

### Teachers

Teachers were asked to identify which grade level(s) they taught. Participants were given four options for grade spans. They could select all categories that fit their current position (see Table 5). Of the 540 respondents, 222 individuals indicated they taught 9th to 12th grade (41%) and 187 taught 6th to 8th grade (35%). Additionally, 291 teachers selected elementary grade levels (K-5th grade); specifically, 157 respondents taught 3rd to 5th grade (29%) and 134 respondents taught kindergarten to 2nd grade (25%). These responses can be reviewed in Table 7.

**Table 7. Grade level taught**

Grade level	n	%*
Kindergarten – 2 <sup>nd</sup> grade	134	24.8%
3 <sup>rd</sup> – 5 <sup>th</sup> grade	157	29.1%
6 <sup>th</sup> – 8 <sup>th</sup> grade	187	34.6%
9 <sup>th</sup> – 12 <sup>th</sup> grade	222	41.1%

\*Teachers may select all grade levels that apply; therefore, the sum of the percentages will not equal 100.

On average, teachers reported being in their current school between eight and nine years ( $M=8.69$ ,  $SD=7.70$ ), as shown in Table 8. Respondents reported teaching, on average, for more than 14 years ( $M=14.41$ ,  $SD=8.66$ ). The respondents’ total years of teaching experience and experience at their current school ranged from *less than a year* to *more than 25 years*.

**Table 8. Teaching experience**

Average Years Taught	n	M	SD
Number of Years Teaching at Current School	532	8.69	7.70
Total Years Teaching	530	14.41	8.66

Table 9 shows that teacher respondents’ primary content area for instruction varied. The most frequently cited content areas of teachers who participated in the survey were English Language Arts (14%), Special Education (14%), or a combination of the core subjects. Respondents were asked to select one primary content area; however, of the 187 teachers to select *other*, more than half indicated that they taught multiple core content areas equally. Other primary content areas reported by participants included teaching all core content areas within their grade span (19%) or providing instructional coaching across subject areas (1%). Additionally, teachers who selected *other* content areas listed content areas such as library and information skills (3%), music (1%), and technology (1%).

**Table 9. Teachers’ primary content area**

Content area	n	%*
English Language Arts (ELA)	75	14.2%
Mathematics	44	8.3%
Science	37	7.0%
Social Studies	25	4.7%
Foreign Language	9	1.7%
Arts / Humanities	27	5.1%
Physical Education	20	3.8%
Technical / Trade	23	4.4%
Special Education	76	14.4%
English Language Learners (ELL)	~	~
Talented and Gifted	~	~
Other	187	35.4%

Note: “~” indicates cell suppression due to  $n < 4$ . The cell with the next smallest size was also suppressed to maintain confidentiality.

\*Percentages may not equal 100 due to rounding.

Teachers had varying levels of computer skills, ranging from novice to expert (see Table 10). The majority of respondents identified their skill level as being intermediate (39%), advanced (35%), or expert (24%). Based on the descriptions of the ratings provided, intermediate teachers are able to use many computer programs; although, they do not have a lot of experience. Advanced teachers,

however, have a great deal of experience with computer programs, while experts are able to apply their experience and knowledge of computers to teach others how to use some programs. Teachers who are experts can also fix minor problems that occur with their computers.

**Table 10. Teacher-reported computer skills**

Computer Skills	n	Novice	Beginner	Intermediate	Advanced	Expert
How would you rate your overall skill level in the use of computers?	533	~	~	39.2%	34.5%	24.4%

Note: “~” indicates cell suppression due to n < 4. The cell with the next smallest size was also suppressed to maintain confidentiality.

### Listening Tour

Teacher-reported computer skills gleaned from survey responses contradict information from the Listening Tour. In particular, the survey results suggest that 98 percent of survey respondents perceived their computer skills to be “intermediate” or better, whereas findings from the Listening Tour suggested that participants had a lower level of skill in using technology.

Listening Tour participants also indicated that, in situations where technology and material infrastructure was available, they perceived implementation as being either inefficiently or inappropriately integrated into classroom instruction as a result of teachers’ lack of experience with and/or resistance to technology. One respondent explained,

*Technology is available, and teachers who are passionate to discover and experiment with the digital tools can implement. But training is time consuming, and not convenient. Many teachers have not evolved out of traditional teaching methods, or are apprehensive about experimenting with new digital tools.*

Several participants expressed the opinion that teachers were unwilling to learn. Others felt intimidated by students who often have more experiences with technology. As one attendee commented, “It’s got to be frustrating and a struggle because the kids are always a step ahead of you, you know? A lot of teachers don’t feel competent to teach with technology, and so that’s a limiting factor.”

### District and School Strategic Planning for Digital Learning and Technology Use

District staff, administrators, and teachers were asked to rate their level of agreement with items pertaining to their district and school strategic planning for Digital Learning, as shown in Tables 10-14. Six items were used to measure district staff’s and administrators’ perceptions and implementation of their strategic plans for Digital Learning. Teachers were asked to rate nine items pertaining to their school’s implementation and vision, as well as the importance and support for Digital Learning. All items were rated on a six-point Likert-type scale, ranging from (1) *strongly disagree* to (6) *strongly agree*.

District staff

Overall, district staff tended to *somewhat agree* or *agree* with items pertaining to the plans for Digital Learning. Respondents agreed that their district offers professional development opportunities to support teachers in using Digital Learning ( $M=4.96, SD=1.14$ ) and schools within their district have a set of commonly used platforms ( $M=4.87, SD=1.33$ ). Descriptive statistics for each item are presented in Table 11. No statistically significant differences were discovered on questions regarding strategic plans for Digital Learning when comparing years of experience or district size for district staff. For district staff, school size and percent of students eligible for free or reduced-price lunches were not used for comparisons.

**Table 11. District-reported strategic plans for Digital Learning**

Scale Items	n	M	SD
My district has a process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.	99	4.52	1.12
My district has a strategic plan for student digital learning.	99	4.56	1.16
My district has implemented its strategic plan for student digital learning.	98	4.64	1.24
My district offers professional development to school staff to use student digital learning.	99	4.96	1.14
The professional development offered through my district adequately prepares school staff to use student digital learning. (e.g. online and formative assessments, resources, software, assistive technology, learning platforms).	98	4.52	1.24
The schools in my district have a set of commonly used formats and/or platforms (e.g., all use Apple or Microsoft, all use MyMathLab, etc).	97	4.87	1.33

Note: Scale is (1) strongly disagree, (2) somewhat disagree, (3) disagree, (4) somewhat agree, (5) agree, (6) strongly agree.

Administrators

Table 12 displays administrators’ perceptions of the strategic plans at their school. The administrators tended to agree that the classrooms in their schools had a set of commonly used formats and/or platforms ( $M=5.00, SD=1.20$ ). Additionally, respondents believed that school staff are supported by the professional development on student Digital Learning offered through the schools; this is noted by the mean score between *somewhat agree* and *agree* ( $M=4.77, SD=1.25$ ). Administrators’ perception of the quality of professional development opportunities was the lowest rated ( $M=4.26, SD=1.20$ ); even still, the respondents tended to *somewhat agree* training adequately prepared school staff to use Digital Learning.

**Table 12. Administrator-reported strategic plans for Digital Learning**

Scale Items	n	M	SD
My school has a process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.	124	4.35	1.26
My school has a strategic plan for student digital learning.	122	4.32	1.33
My school has implemented its strategic plan for student digital learning.	121	4.30	1.28
My school offers professional development to school staff to use student digital learning.	124	4.77	1.25
The professional development offered through my school adequately prepares school staff to use student digital learning. (e.g., online and formative assessments, resources, software, assistive technology, learning platforms).	122	4.26	1.20
The classrooms in my school have a set of commonly used formats and/or platforms (e.g., all use Apple or Microsoft, all use MyMathLab, etc).	121	5.00	1.20

Note: Scale is (1) strongly disagree, (2) somewhat disagree, (3) disagree, (4) somewhat agree, (5) agree, (6) strongly agree.

Researchers examined the data to determine whether there were differences among administrators with low and high percentages of students eligible for free and reduced-price lunch, years of experience, school size, and district size. Contrasts revealed that administrators at schools with a lower percentage of students eligible for free or reduced-price lunches were more likely to agree to questions about strategic plans for Digital Learning when compared to those administrators at schools with higher percentages of students eligible for free or reduced-price lunches. However, after a correction for family-wise error, this finding was no longer statistically significant. Compared with administrators with 1 to 3 years of experience, 6 to 10 years of experience, or 11 or more years of experience, administrators with 4 to 5 years in their position had a greater likelihood of agreeing to the questions “My school has a strategic plan for student Digital Learning,” “The professional development my school offers adequately prepares school staff to use student Digital Learning” and “The classrooms in my school have a set of commonly used formats and/or platforms.”

Lastly, administrators at larger schools were more likely to agree to the questions “My school has implemented its strategic plan for student Digital Learning” and “My school offers professional development to school staff to use student Digital Learning.” These findings can be reviewed in Table 13.

**Table 13. Differences in administrator-reported strategic plans for Digital Learning**

Question	FRL	n	M	SD	F	p
My school has a process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.	Low	57	4.54	1.26	4.69	0.03*
	High	60	4.12	1.27		
My school has a strategic plan for student digital learning	Low	57	4.53	1.23	8.58	0.00
	High	58	4.10	1.33		
My school has implemented its strategic plan for student digital learning.	Low	57	4.54	1.23	9.73	0.00
	High	57	4.09	1.29		
My school offers professional development to school staff to use student digital learning	Low	57	5.04	1.07	14.66	0.00
	High	60	4.48	1.28		
The professional development offered through my school adequately prepares school staff to use student digital learning.	Low	57	4.48	1.10	6.53	0.01
	High	59	4.05	1.22		
Question	Years of Experience	n	M	SD	F	p
My school has a strategic plan for student digital learning.	1 to 3 Years	50	4.26	1.19	3.84	0.01
	4 to 5 Years	14	4.79	1.11		
	6 to 10 Years	23	3.78	1.57		
	11 or More Years	35	4.57	1.36		
The professional development offered through my school adequately prepares school staff to use student digital learning.	1 to 3 Years	51	4.22	1.17	2.86	0.04*
	4 to 5 Years	14	4.79	0.80		
	6 to 10 Years	22	4.00	1.27		
	11 or More Years	35	4.29	1.30		
The classrooms in my school have a set of commonly used formats and/or platforms (e.g., all use Apple or Microsoft, all use MyMathLab, etc).	1 to 3 Years	50	5.02	0.94	5.37	0.00
	4 to 5 Years	14	5.43	0.51		
	6 to 10 Years	22	4.27	1.72		
	11 or More Years	35	5.26	1.17		
Question	School Size	n	M	SD	F	p
My school has implemented its strategic plan for student digital learning.	Low	48	4.23	1.33	4.29	0.04*
	High	66	4.38	1.27		
My school offers professional development to school staff to use student digital learning.	Low	48	4.62	1.38	6.57	0.01
	High	69	4.84	1.21		

Note: Scale is (1) strongly disagree, (2) somewhat disagree, (3) disagree, (4) somewhat agree, (5) agree, (6) strongly agree.

Note: Using a Bonferroni Correction  $p$  must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

## Teachers

Teachers tended to *somewhat agree* that schools have a strategic plan for Digital Learning and use of technology ( $M=4.10$ ,  $SD=1.28$ ). Teachers reported a strong desire to implement student Digital Learning ( $M=5.17$ ,  $SD=1.09$ ) and felt that Digital Learning is important for student success in the

21st century ( $M=5.40$ ,  $SD=1.01$ ). Descriptive statistics (i.e., mean and standard deviation) by item are presented in Table 14.

**Table 14. Teacher perceptions of strategic planning for Digital Learning**

Scale Items	n	M	SD
I desire to implement student digital learning.	524	5.17	1.09
My school has a process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.	486	4.14	1.29
My school has a strategic plan for student digital learning.	480	4.10	1.28
My school has implemented its strategic plan for student digital learning.	464	4.04	1.28
My school offers professional development to school staff to use student digital learning.	521	4.22	1.33
The professional development offered through my school adequately prepares school staff to use student digital learning.	517	3.75	1.30
The classrooms in my school have a set of commonly used formats and/or platforms (e.g., all use Apple or Microsoft, all use MyMathLab, etc.).	506	4.74	1.29
Use of student digital learning in the K-12 formal school setting is important for student success in the 21st Century	504	5.40	1.01
Pre-service training adequately prepared me to effectively implement education technology in the classroom	508	3.68	1.38

Note: Scale is (1) strongly disagree, (2) somewhat disagree, (3) disagree, (4) somewhat agree, (5) agree, (6) strongly agree.

Teachers from larger districts agreed more strongly with the question “My school has a strategic plan for student Digital Learning” and “The classrooms in my school have a set of commonly used formats and/or platforms” when compared to teachers from smaller districts. With respect to school size, teachers at smaller schools agreed more strongly with several of the planning for Digital Learning questions when compared to teachers at larger schools. These differences can be reviewed in Table 15. No other statistically significant results were found.

**Table 15. Differences in teacher perceptions of strategic planning for Digital Learning**

Scale Items	District Size	n	M	SD	F	p
My school has a strategic plan for student digital learning	Large	202	4.27	1.17	4.99	0.03*
	Small	276	3.97	1.37		
The classrooms in my school have a set of commonly used formats and/or platforms	Large	215	5.01	1.05	20.23	0.00
	Small	289	4.53	1.05		
Scale Items	School Size	n	M	SD	F	p
My school has a process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.	High	251	4.00	1.33	9.76	0.00
	Low	219	4.32	1.19		
My school has a strategic plan for student digital learning.	High	247	3.91	1.28	11.41	0.00
	Low	219	4.32	1.21		
My school has implemented its strategic plan for student digital learning.	High	239	3.83	1.28	13.83	0.00
	Low	211	4.30	1.20		
My school offers professional development to school staff to use student digital learning.	High	273	4.10	1.36	4.71	0.03*
	Low	233	4.35	1.28		
The professional development offered through my school adequately prepares school staff to use student digital learning.	High	269	3.61	1.33	5.13	0.02*
	Low	233	3.92	1.24		
Pre-service training adequately prepared me to effectively implement education technology in the classroom.	High	267	3.56	1.44	4.76	0.03
	Low	226	3.83	1.26		

Note: Scale is (1) strongly disagree, (2) somewhat disagree, (3) disagree, (4) somewhat agree, (5) agree, (6) strongly agree. All results were statistically significant at the  $p < .05$  level.

Note. Using a Bonferroni Correction  $p$  must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

### Teacher Focus Groups

In focus group sessions, teachers explained how their schools defined the technology skills that students should know and be able to do. They also described whether they felt their students came prepared with necessary technology skills to be successful in class. Lastly, teachers provided feedback on how the schools and districts could support student Digital Learning.

Teachers were divided with regard to whether their schools defined the technology skills that students should know and be able to demonstrate. Many teachers explained that their schools do not have a definition in place regarding technology skills for students. As one teacher mentioned, “We don’t have anything like a common core standard or anything that says they have to know how to use Microsoft Word, or PowerPoint, or Excel, any of that.” These participants felt as though they taught students how to use particular pieces of technology as they related to specific class assignments or projects. As one participant described, “The teachers, if they need it for that project, they teach it, and then the students have it after that.” This finding suggests that some teachers perceived technology use as a means to an end, rather than a concept that should be integrated into everyday instruction. Additional supports might help teachers to see beyond using technology for only specific projects, helping them to integrate technology more fully into their classrooms.

Other teachers did, however, explain that their schools had a defined set of skills for students regarding technology use. Standards were either based around a developed set of technology skills for a specific school, or aligned to the Common Core Standards. As one teacher explained, her district developed its own technology plan that integrated the skills students should know and be able to do:

*We have created a tech plan. Each building in our district has a tech plan. We use the standards to define the areas in which we needed to focus for our instruction. Also, just as part of our state standards, some have incorporated them into multimedia projects.*

In other cases, teachers explained that school staff tailored their definitions of what students should know and be able to do around the Common Core Standards:

*We know what the Common Core Standards are, so we developed our own curriculum to meet those. Google Docs, and all that goes with it and that, is something that we thought was important. Because of the middle school and Common Core needing kids to type, typing has been a big push this year.*

Another teacher elaborated upon how the Common Core Standards have influenced the perspectives of school staff regarding what students should know and be able to do,

*Our school has been digging into those [Common Core] standards and looking at what is expected at different grade levels. Students have to be able to type twenty words per minute by the end of the year and then additionally they have to be able to produce and publish writing in a variety of formats.*

Teachers also provided feedback on how prepared they felt their students were to use Digital Learning resources. Participants were divided on this topic, with some feeling that students were very prepared while others felt that students entered the classroom with serious challenges. This divide seemed to hinge around family support and access to technology resources, especially for elementary-level students. One teacher explained, “I think most are prepared. Most are familiar enough with computers that they can just jump right in and do them,” while another mentioned,

*We have a lot of kids who live out of town, where they don't have internet access, or they have limited internet access, and that causes a lot of trouble. There are some kids whose families cannot afford internet, so they don't have it at home.*

These issues seemed to create a digital divide, where some students were very prepared and others had little to no experience with technology. This theme was captured by one teacher who said, “... our digital divide is growing because right now Wyoming is hurting economically, and so that's the first thing that gets cut. So we're finding more and more kids do not have internet access at home.”

While students varied in their individual abilities to use technology, teachers described what types of professional development they would like to receive in order to better address students' Digital Learning needs in the classroom. The most common theme mentioned by teachers was general professional development. That is, teachers wanted a professional development that would expose them to different types of technology they could use in the classroom. For instance, one teacher explained, “I'm always looking for more tools to bring in for students. So, I appreciate when we can have exposure and training on upcoming apps or software.” Another teacher went on to say,

*I have just noticed that sometimes the best professional learning for us is to share out things that are working in other classrooms. So just quick little share outs about a specific App or program that would be applicable to a certain grade level.*

Some teachers, however, felt that professional development should be more specific and tailored to student and school needs, rather than general and unstructured. In this way, teachers could more effectively meet the needs of their students. As one teacher explained,

*I think the biggest thing with doing any professional development – it's got to have a focused plan as to what you are going to be helping. And I'm sitting here thinking, unless we had something in mind that we are going to actually do, and then have professional development on it, I think that would be more effective than just having a general PD on technology in the classroom.*

Other participants simply wanted professional development focused on a program or platform they had planned to use in the future, “Definitely Office 365 because they are going to be using it for education and there are so many exciting things with digital portfolios that can be set up. So, that’s the top of my list, Office 365.”

### Student Focus Groups

In focus groups, students talked about how their schools encouraged the development of technology-based skills. They also discussed whether they felt prepared to use technology skills in class. Finally, students explained how their teachers could improve Digital Learning and instruction.

Students explained that teachers helped them acquire the skills they needed to successfully use technology in the classroom. In many cases, these skills were aligned to the Common Core, such as building writing proficiency. “We practice our typing skills in third grade, on a typing website. And you learn how to type stories and what fingers you use to go to what letter,” one student explained. Another participant went on to say, “...we also set goals for our writing. Our teachers like us to get threes and fours, mostly. We try and set our goals for fours, mostly. And that helps us get better with our writing and stuff on the computers.”

The majority of the participating students felt prepared to use technology devices in the classroom. As one student explained, “We can just get on and do it with no difficulties at all, unless our computer is not working.” Another student went on to say, “A lot of kids in our class know how to use the computers.” This included the use of devices such as iPads, Chromebooks, Dot and Dash Robots, laptops and desktop computers. “We usually use the iPads and lower grade levels they use the iPads for like games and stuff and fifth graders now we use it for games and stuff, but only got the Dash Robots this year,” one student explained.

Many students also talked about how they enjoyed and felt confident in using programs and applications. This included programs such as IXL, PowerPoint, Word, Prodigy, Dragon Dictation, Connect Ed, Khan Academy and others. This theme was captured by the student who said, “We do like a math lesson on our board, and then we go to IXL and practice it.” Another student supported this theme by saying, “We use Compute It. It’s like this game where it’s on the Promethean board and then you answer questions that you not only learn in your classroom but they make it fun.”

With regard to what teachers could do differently, most students wanted additional time with devices, programs, and applications. As one student discussed, “We could do more Kiddle. Our class likes to go on and research animals or different types of animals or anything, really.” Another student commented about whether teachers should use more technology by saying,

*I think that we should – we do pods in Wyoming, and we use handheld books and pencils, I think, we should use technology to do that because it – well, because we get like a whole bunch of pencils from all over the state. And I think if we used technology it cuts down on all the paper we use and like more trees around us for the National Forrest.*

Some students, however, felt like too much time was spent with Digital Learning resources. These students wanted more time with traditional tools (e.g., paper, pencil, or hard copies of books). When too much technology was used, these students zoned out or became bored. As one student mentioned, “I think my class uses technology too much because we usually get on it every hour, and it kind of gets boring after a while.” When asked how learning could be improved, another student explained, “Not using only technology. Like instead of typing everything, we could hand write it.”

### Listening Tour

The above findings appear to conflict with the perspectives conveyed during the Listening Tour. In particular, participants overwhelmingly agreed that technology-centered professional development for teachers and faculty is integral to the successful implementation of Digital Learning. Many respondents shared the perception that teachers are either unable or unwilling to use technology to support instruction effectively, providing reasons such as educators’ lack of experience with technology, instructors feeling intimidated or overwhelmed by technology, and teachers failing to perceive instructional technology as beneficial. One interviewee explained,

*Teachers need to be taught over time to implement online learning. They need professional development about how to manage the devices, how to use them as tools, how to collaborate and communicate with parents, how to collaborate and communicate with students.*

Several respondents reported that they have been surprised to find that newer, younger educators who have recently earned their teaching credentials do not possess the technical knowledge or experience they had anticipated. These respondents expressed the opinion that instructors need to be familiarized with the use of instructional technology during preservice teacher training, and that the ability to effectively use instructional technology should be a prerequisite for all professional educators. One of these respondents commented,

*I worry that technology training for teachers is more of just a check. It's more of a static, “Yes, every teacher has been trained.” It really takes individual focus and returning to what is the purpose of technology, what are we using it in our classroom for, what are we trying to get out of it, and looking at the data coming out to redefine the process and doing that continually over and over and over, and personalizing the professional development for teachers. That needs to be revamped and changed and continually refined in order to be really effective.*

Results from this Listening Tour did, however, suggest that participants perceived the implementation of Digital Learning in schools as an important goal. Survey respondents and

interview participants alike overwhelmingly expressed the belief that technology has become an integral piece of everyday American life, playing a fundamental role in both academia and the workforce. A survey respondent reported,

*I find this question interesting because it almost suggests the old mindset that technology is something aside from the mainstream, when in fact technology should be embedded in the very fabric of everything we do, and is embedded in everything we do.*

Others expressed similar sentiments, with one going so far as to comment, “Technology at this point is so integral to the daily and regular functioning of almost every aspect of society that choosing to ignore it as an educational opportunity would be almost criminal.”

Interview participants and survey respondents also indicated that the implementation of technology provides the potential for additional opportunities for students, both in the classroom and beyond. One interviewee stated,

*Technology is also used for students with disabilities. There is assistive technology. For example, they can have the science book read to them without needing to, like, have a teacher record it. So there are a lot of ways that technology is being used to actually provide access to students, who have traditionally struggled in school.*

Others agreed, with one commenting, “Integration of technology enriches the learning experience and is capable of delivering sophistication and opportunities that would have never been available to a student without technology.” Listening Tour participants also commented on the positive effect that the implementation of instructional technology can have on the community as a whole.

### Interest in Networking with Others Related to Student Digital Learning

District staff, administrators, and teachers reflected on their interest in networking with other educators, specifically related to student Digital Learning. Results by participant group are shown in Table 16. Overall, the majority of the district staff and administrators indicated interest in networking with others (75% and 79%, respectively), while only half of teachers indicated they may be interested in such opportunities (50%). An additional 33 percent of teachers stated they are interested in networking with other educators on Digital Learning topics.

For those interested in networking with other educators, respondents were asked to provide feedback on their preferred method of communication. Many participants identified face-to-face meetings or networking events, online professional learning communities, and webinars on relevant topics (e.g., successes and best practices in Wyoming school districts) as their top preferences. Some participants commented that any form of communication or combination of methods would be effective, while others added that the format would depend on the topic discussed.

The majority of district staff, administrators, and teachers also indicated that Digital Learning guidelines and recommendations would be helpful for their district or school (74%, 69%, and 70%, respectively). Approximately one-quarter of administrators and teachers (27% and 25%, respectively) were unsure whether their school would benefit from such guidelines.

**Table 16. Interest in networking by participant group**

	District		Administrators		Teachers	
	n	%	n	%	n	%
<b>Interest in networking with other educators</b>						
Yes	73	74.5%	99	79.2%	174	32.6%
No	25	25.5%	26	20.8%	92	17.3%
Maybe	N/A		N/A		267	50.1%
<b>Preferred method of communication</b>						
Face-to-face meetings and networking events	23	31.5%	33	33.7%	194	44.1%
Online PLC	17	23.3%	28	28.6%	113	25.7%
Content management system	~	~	~	~	10	2.3%
Webinars hosted by districts	25	34.2%	33	33.7%	109	24.8%
Other	~	~	~	~	14	3.2%
<b>Need for guidelines and recommendations</b>						
Yes	73	74.5%	87	69.0%	370	70.1%
No	~	~	5	4.0%	24	4.5%
Unsure	~	~	34	27.0%	134	25.4%

Note: “~” indicates cell suppression due to n < 4. The cell with the next smallest size was also suppressed to maintain confidentiality.

### Online Learning Needs

Respondents also supplied feedback on interest in distance learning opportunities. Specifically, district staff and administrators reported on whether they believed students would benefit from distance learning courses and, if so, the type(s) of opportunities that would benefit students most. Teachers were asked whether they would be interested in teaching distance learning classes through their schools.

#### District staff

Two-thirds of district staff (67%) believed there are distance education programs that would benefit students in their district, if such opportunities were offered. Respondents interested in distance learning opportunities were then asked about the type of courses that were of interest (see Table 17). The majority of district staff chose courses related to gifted and talented (70%), Advanced Placement (69%), foreign language (59%), and technical training (59%). Additionally, the majority of district staff (63%) stated they may have some interest in learning how to develop online courses, while 29 percent of respondents stated they are, in fact, interested in online course development.

**Table 17. District: Types of distance learning opportunities**

Types of Distance Learning Courses	n	%*
Advanced Placement courses	44	68.8%
Hathaway Success Curriculum	25	39.1%
Gifted and Talented courses	45	70.3%
Foreign language courses	38	59.4%
Technical courses	38	59.4%
Other	5	7.8%

\*Respondent could select all options that apply; therefore, the sum of percentages does not equal 100.

District staff from larger school districts were more likely to believe that the Hathaway Success Curriculum would be of benefit to the students served in their school district. No other statistically significant results were discovered. These results can be reviewed in Table 18.

**Table 18. Differences in types of distance learning opportunities for district staff**

Question	District Size	n	Percent	X <sup>2</sup>	p
Hathaway Success Curriculum	Small	42	12%	8.06	0.01
	Large	47	38%		

Note. Using a Bonferroni Correction p must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

### Administrators

Administrators, on the other hand, did not believe students would benefit from distance learning courses (60%). The 40 percent of respondents who felt that offering distance learning opportunities would benefit their school reported on the specific types of distance learning they want incorporated at their schools. Most administrators were interested in gifted and talented (55%) as well as advanced placement (51%) distance learning opportunities. The majority of administrators (51%) indicated an interest in learning how to develop online courses, while 15 percent of respondents wanted to learn about online course development. All responses related to administrators’ interest in types of distance learning opportunities are presented in Table 19. No statistically significant differences were discovered regarding administrator responses to distance learning opportunity questions.

**Table 19. Administrator: Types of distance learning opportunities**

Types of Distance Learning Courses	n	%*
Advanced Placement courses	25	51.0%
Hathaway Success Curriculum	20	40.8%
Gifted and Talented courses	27	55.1%
Foreign language courses	24	49.0%
Technical courses	24	49.0%
Other	7	14.3%

\*Respondent could select all options that apply; therefore, the sum of percentages does not equal 100.

### Teachers

A little over half of teacher respondents indicated they are not interested in teaching online courses (51%), as shown in Table 20. However, the remaining respondents indicated having some interest (*maybe*, 31%) or full interest in teaching courses online through their school (*yes*, 18%). There were 32 districts represented by the teachers interested in online courses.

**Table 20. Teacher interest in teaching online courses**

Are you interested in teaching online courses at your school?	n	%
Yes	93	17.5%
No	275	51.8%
Maybe	163	30.7%

\*Percentages may not equal 100 due to rounding.

Using an analysis of variance, differences between teacher responses were examined. The only statistically significant differences were by content area; educators who taught foreign language, art/humanities, and physical education had the lowest interest in teaching online courses (see Table 21).

**Table 21. Differences in teacher interest in teaching online courses**

Content Area	n	M	SD	F	p
English language arts	74	2.24	0.79	2.22	.01
Mathematics	43	2.14	0.80		
Science	36	2.03	0.81		
Social studies	25	1.92	0.81		
Foreign language	9	2.56	0.53		
Arts/humanities	27	2.52	0.58		
Physical education	20	2.70	0.57		
Technical/trade	23	2.09	0.79		
Special Education	76	2.55	0.76		
ELL	~	~	~		
Talented and Gifted	~	~	~		
Other	184	2.42	0.70		

Note: Scale is (1) Yes, (2) Maybe, (3) No

Note: “~” indicates cell suppression due to n < 4. The cell with the next smallest size was also suppressed to maintain confidentiality.

Note: Using a Bonferroni Correction p must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

### Teacher Focus Groups

None of the focus group participants indicated that they had taught an online course. Teachers explained that there is little to no opportunity to teach a class conducted entirely online, especially for elementary teachers. Teachers did explain, however, that they incorporate online components in their classroom instruction. In particular, teachers included online components from Edgenuity, My Big Campus, and SchoolView platforms. As one teacher described “For the math courses, we’ve been using an online program called Edgenuity. It allows us to offer twenty different math courses, and you can schedule students in a fall or a spring semester, either semester, depending on what credit needs they have.”

In regard to how these platforms are integrated, some teachers explained that they used online components to provide an additional method of instruction to students. “I like that Edgenuity is video-based, instead of reading so much. And, there were definitely pros and cons with that transition. That style of learning met some learners more, but then, some learners that did well on the old style didn’t want to watch the videos,” one participant stated.

Other participants seemed to only use the online resources provided by these platforms to post class information such as grades or syllabi. This sentiment was captured by a teacher who explained,

*I incorporated for the first couple years My Big Campus, for an online platform for classes, and then, I’ve gone away from that, because we are aiming more towards traditional, hands-on classes. But I*

*only use My Big Campus for support for where to post syllabi, where students can communicate with me, where they can always access projects and information.*

Some teachers felt that they had to be in face-to-face settings in order to best meet the needs of their students. These participants explained that online components of classes have not been extremely successful. As one secondary teacher stated,

*The main reason I switched was because the online courses are usually at your own pace. And that, unfortunately, for our students, was not a very productive thing. So, for online courses, there's obviously still a need for them taking place, but I do believe it's important that they have a more rigid schedule. A rigid schedule, that's the best way to put it.*

### Student Focus Group

Similar to the perspectives described in the teacher focus groups, none of the students indicated that they had taken an online course. Students did explain that some of their classes offered online components, however. Students reported that the teachers used platforms and programs to connect with students to complete assignments or class projects. One student explained that their class used an online component called Connect Ed. Another student stated “we’re able to access IXL using an online platform while at home, “Sometimes, I do IXL at home. If there's a subject that I'm lacking in, they might have something on it.”

### Listening Tour

The findings summarized above appear to conflict with information provided by Listening Tour participants, who communicated strong support for providing online course offerings for remote students. Most Listening Tour respondents reported the perception that these students would be best served through the implementation of telecommunication and online coursework, allowing them to connect with students and educators from across the state of Wyoming. Listening Tour participants also communicated the belief that, when remote students are limited to the traditional model of enrolling in only classes available to them at their physical location, they are missing out on a wide variety of learning opportunities. “We need to make technology available to all students,” commented a Listening Tour participant. Another added,

*We need to bring virtual experiences to students that do not have access to any environment different than their own. You can travel the world! There are other classrooms wanting to connect. They can learn a foreign language, create products, and the sky is the limit!*

Listening Tour participants were asked to explain why they felt it is important for technology to be implemented into classroom instruction. Listening Tour participants overwhelmingly expressed the belief that technology has become an integral piece of everyday American life, playing a fundamental role in both academics and the workforce. Others expressed similar sentiments, with one going so far as to comment,

*Society has functioned through technology for centuries. We leverage technology to simplify tasks, expand our capabilities to process information and make decisions, harness the world around us, and*

*so forth. Even this survey is dependent on technology to maximize responses with minimized expenses. The argument that technology does little to influence education died in the 1990s. With more and more training and education taking place online, technology is becoming an indispensable part of education. High demand careers in medicine, business, and engineering rely on computer systems, advanced machinery, and so forth to meet daily requirements. Even fields like history, library science, and others rely more and more on technology to archive, search, locate, and disseminate information. We do our students a HUGE disservice by not harnessing that technology.*

Participants also indicated that the implementation of technology in instruction provides major benefits in increasing student engagement. “I think it makes the teaching real for kids because technology is their life,” reported one participant. Another added,

*Unless we include [technology] in whatever we're doing, we're just old fashioned in their mind. We're just old, and you know, not really useful because books are old fashioned. So I think it makes it more relevant to them. It speaks in their language, their digital language.*

Another responded,

*Just to think about this, why is it that kids like gaming so much? They get that instant gratification. They know their score. They know what level they're on. They know what badge they've earned. The same thing is true with technology within a classroom. If we're using it correctly and, you know, you might be using this app here, you might be using this digital tool here, all of a sudden students see where they're at. They see their progression. They see how many questions they got right according to this, or they see their level of understanding here and how powerful it is when we start to use that data, when we start to use those reports to continue to encourage students in their learning and in their capacity.*

Other respondents expressed the opinion that technology “is the language the students speak,” and many reported having witnessed positive changes in student engagement as a result of effective implementation. Another Listening Tour participant explained,

*They [students] like it. And you can see the difference. We put in Chromebooks at the high school and you can see the positive impact that it made. Kids are, ‘Oh, I got my little device,’ and you're making education fun for them. It's education but in the language they speak, which is technology. You're making it interesting.*

Listening Tour participants also indicated that the implementation of technology provides the potential for additional opportunities for students, both in the classroom and beyond. One respondent explained,

*It's not just about the kids in our building. We teach students these skills, and I know that a lot of their parents don't have these skills. So these kids come home and can tell their parents, ‘Oh, you shouldn't do that. That's a phishing scam.’ So they can bring down this experience to parents that just either have not had technological opportunities in their lives.*

## Barriers to Implementing Digital Learning

A number of potential barriers to Digital Learning may occur during implementation. Each group of participants were asked about the level of barriers they experienced as a district or school and to expand on the types of barriers that exist. For those who experienced barriers related to professional development, participants identified training needs and information that would benefit teachers. Respondents specified financial needs, barriers that restricted their district or school from having appropriate financial support, and goals they would like to accomplish if sufficient finances were available.

### District staff

The majority of district staff reported that they experienced some barriers (74%), some of which occurred as a result of student cooperation (48%), equipment needs (42%), and availability of or appropriate professional development (39%). Respondents were able to indicate any and all barriers they believe they experienced in their districts, as shown in Table 22. No statistically significant differences were discovered across barriers to implementation questions for district staff.

**Table 22. District: Barriers to Digital Learning implementation**

Amount of Barriers	n	%
No barriers	13	13.5%
Some barriers	71	74.0%
A lot of barriers	8	8.3%
We have not implemented digital learning in my school	4	4.2%
Types of Barriers	n	%*
Equipment needs (e.g., computers, smart boards, etc.)	33	41.7%
Internet connectivity (i.e., connection is problematic)	30	38.0%
Internet Availability (i.e., don't have needed internet)	9	11.4%
Availability of or appropriate professional development (e.g., need assistance with implementation)	31	39.2%
Insufficient technical support staff	21	26.6%
Student cooperation	38	48.1%
Other	11	13.9%

\*Respondents were able to select all topics that apply; therefore, sum of percentages does not equal 100.

There were 31 district staff who indicated that their district experienced barriers related to professional development. The respondents were asked to identify topic areas that would increase school staff's comfort with implementing Digital Learning and the use of technology. District staff reported that their teams would benefit from professional development opportunities on blended learning (87%), differentiated instruction through the use of technology (81%), use technology resources (77%), and manage their classroom while using technology (77%). Findings are displayed in Table 23. No statistically significant differences were discovered among district staff regarding needs for professional development questions.

**Table 23. District staff-reported needs for professional development**

PD Topics	n	%*
Understanding why technology integration in the classroom is important for student 21st century skill development	19	61.3%
Understanding how to use technology resources	24	77.4%
Understanding how technology can be used to differentiate instruction for students	25	80.6%
Understanding effective classroom management strategies when using technology in the classroom	24	77.4%
Understanding how to get access to technology resources for my classroom	14	45.2%
Understanding how to implement blended learning	27	87.1%
Understanding how to design and develop online courses (to be used for either full online courses or course content for blended learning)	17	54.8%
Understanding how to utilize Google Classroom or Office 365 Education	23	74.2%

\*Respondents were able to select all topics that apply; therefore, sum of percentages does not equal 100.

A quarter of the respondents (25%) felt they had enough financial resources to meet district goals. However, others believed they do not have (31%) or only have some (44%) of the financial resources needed to accomplish district goals for Digital Learning. Respondents commented that state-wide reductions in school budgets, as well as the need to allocate funds to maintain current technology and staff, limit their financial resources to implement Digital Learning. Many of the respondents indicated that financial resources have declined and continue to decline over time. Others reported that their current implementation of Digital Learning in classrooms warrants additional monies to support the connectivity, supply technology to teachers and/or students, and obtain the appropriate accessories (e.g., cases, chargers, educational programs and add-ons).

Respondents were asked to identify goals that they would aim to meet given sufficient financial resources. District staff reported that they would expand their technology resources, including updating or obtaining devices, securing a more reliable connection or bandwidth, and purchasing quality programs for instruction. The majority of district staff also focused on professional development and other forms of technological support for their school staff. Some of the respondents indicated that teachers do not have the appropriate support to implement technology or address their needs within the schools. Additional training and knowledge to effectively utilize technology might help with implementation. One respondent suggested that teachers vary in their ability to understand and use Digital Learning, therefore, professional development could be offered to teachers with initially high technology knowledge, with the expectation they would be able to leverage any increases in technology knowledge to support their colleagues.

### Administrators

The majority of administrators felt their schools experienced some barriers when implementing Digital Learning (65%). Most respondents reported the availability of appropriate professional development is a barrier to implementation (51%). Administrators also identified equipment needs (43%), student cooperation (34%), and internet connectivity (31%) as barriers. Refer to Table 24 for administrator responses.

**Table 24. Administrator: Barriers to Digital Learning implementation**

Amount of Barriers	n	%
No barriers	23	18.9%
Some barriers	79	64.8%
A lot of barriers	14	11.5%
We have not implemented digital learning in my school	6	4.9%
Types of Barriers	n	%*
Equipment needs (e.g., computers, smart boards, etc.)	40	43.0%
Internet connectivity (i.e., connection is problematic)	29	31.2%
Internet Availability (i.e., don't have needed internet)	6	6.5%
Availability of or appropriate professional development (e.g., need assistance with implementation)	47	50.5%
Insufficient technical support staff	25	26.9%
Student cooperation	32	34.4%
Other	14	15.1%

\*Respondents were able to select all topics that apply; therefore, sum of percentages does not equal 100.

Administrators at smaller schools were less likely to see insufficient technical support staff as a barrier to Digital Learning implementation, when compared to administrators at larger schools. No other statistically significant differences were discovered. These results can be reviewed in Table 25.

**Table 25. Differences in barriers to Digital Learning implementation for administrators**

Question	School Size	n	Percent	X <sup>2</sup>	p
Insufficient technical support staff	Small	49	6%	9.74	0.002
	Large	72	29%		

Note: Using a Bonferroni Correction  $p$  must be less than 0.01 for statistical significance. Comparisons with an “\*\*” are no longer significant after the Bonferroni Correction.

Table 26 displays administrators' perceptions of knowledge and skills that would address the barriers related to professional development. Respondents ( $n = 47$ ) were able to select multiple professional development topics from which they believed the school staff would increase their ability to implement student Digital Learning. The majority of administrators believed that staff would benefit from understanding how to leverage technology for differentiated instruction (85%), how to use technology resources (70%), and how to implement blended learning (70%). Additionally, more than half of the respondents also identified the importance of integrating technology into the classroom for student skill development (66%) and using effective classroom management strategies during technology implementation (57%) as needed areas of professional development.

**Table 26. Administrator-reported needs for professional development**

PD Topics	n	%*
Understanding why technology integration in the classroom is important for student 21st century skill development	31	66.0%
Understanding how to use technology resources	33	70.2%
Understanding how technology can be used to differentiate instruction for students	40	85.1%
Understanding effective classroom management strategies when using technology in the classroom	27	57.4%
Understanding how to get access to technology resources for my classroom	23	48.9%

PD Topics	n	%*
Understanding how to implement blended learning	33	70.2%
Understanding how to design and develop online courses (to be used for either full online courses or course content for blended learning)	21	44.7%
Understanding how to utilize Google Classroom or Office 365 Education	~	~
Other	~	~

Note: “~” indicates cell suppression due to n < 4. The cell with the next smallest size was also suppressed to maintain confidentiality.

\*Respondents were able to select all topics that apply; therefore, sum of percentages does not equal 100.

Administrators at smaller schools were less likely to want professional development related to accessing technology resources. However, after correcting for the family-wise error rate, these results were no longer statistically significant. No other statistically significant differences were discovered. These results can be reviewed in Table 27.

**Table 27. Differences in administrator-reported needs for professional development**

Question	School Size	n	Percent	X <sup>2</sup>	p
Understanding how to get access to technology resources for my classroom	Small	49	10%	4.15	0.04*
	Large	72	25%		

Note: Using a Bonferroni Correction p must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

Administrators indicated they did not have financial resources (22%) or only had some of the necessary financial resources (40%) to accomplish goals for Digital Learning. They added that there are state-wide budget reductions that create barriers to implementing desired technology for classrooms. Additionally, some administrators stated that their district determines the allocation of such funds, which do not focus on technology or supports for technology. Others stated that their schools have a set amount of financial resources, based on student population, which can be used toward integrating Digital Learning; however, they expressed that their school can afford a limited amount of technology. Administrators specifically stated that they would like to obtain enough devices for a one-to-one ratio of tablets or computers per student, while others simply want to provide a mobile computer lab for teachers and students. Respondents stated that they experience difficulties in maintaining their current technology should anything need repaired or replaced in their buildings. Some technology in their schools is outdated and lacks compatibility with necessary programs; those administrators have aimed to develop a strategic plan to replace the devices and tools over time.

The respondents provided a variety of goals they would achieve with sufficient financial resources. Many aim to supply teachers with devices for all of their students or provide a bank of extra tablets or computers when technological difficulties arise. Administrators believed the state or districts should develop a one-to-one initiative for technology integration in classrooms. They also added that technology could support communication with and needs of parents and students outside of the classroom. In addition to equipment needs, administrators felt they could increase the amount and quality of professional development opportunities specific to digital learning strategies. They

reported that school staff would benefit from training on integrating technology to differentiate instruction and further meet student needs in the classroom.

### Teachers

Most teachers experienced some barriers in implementing student Digital Learning (64%). Teachers reported that they experienced barriers based on equipment needs (56%), availability of and appropriate professional development (51%), and problematic internet connectivity (40%). In addition to the barriers shown in Table 28, teachers stated that time is a barrier for them and students. They felt they do not have enough time to research technology resources, learn about and practice with technology for lesson planning, and use the technology with students effectively. Teachers also stated that while they have equipment, the devices or software is often outdated, which can negatively affect students’ digital experience or impede the lesson altogether.

**Table 28. Teacher: Barriers to Digital Learning implementation**

Amount of Barriers	n	%
No barriers	50	9.9%
Some barriers	324	64.4%
A lot of barriers	129	25.6%
Types of Barriers	n	%*
Equipment needs (e.g., computers, smart boards, etc.)	252	55.6%
Internet connectivity (i.e., connection is problematic)	179	39.5%
Internet Availability (i.e., don’t have needed internet)	28	6.2%
Availability of or appropriate professional development (e.g., need assistance with implementation)	232	51.2%
Insufficient technical support staff	122	26.9%
Student cooperation	63	13.9%
Other	80	17.7%

\*Respondents were able to select all topics that apply; therefore, sum of percentages will not equal 100.

Statistically significant differences were discovered regarding the number of barriers experienced by teachers. In particular, teachers at larger districts experienced fewer barriers overall (these results can be reviewed in Table 29). However, after controlling for spurious findings, these results were no longer significant. No other statistically significant differences were discovered.

**Table 29. Differences in barriers to Digital Learning implementation for teachers**

Question	District Size	n	M	SD	F	p
Barriers to digital learning implementation	Small	52	2.15	0.83	4.23	0.04*
	Large	70	1.93	0.60		

Note: Using a Bonferroni Correction p must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

As previously mentioned, teachers identified the need for professional development as a barrier to Digital Learning implementation. Table 30 displays teachers’ identified needs for professional development topic areas, including methods for increasing teachers’ knowledge and use of technology in the classroom. Respondents were able to select all interest areas in which they felt they would benefit from information and/or training. More than two-thirds of the teachers felt they would benefit from understanding how to use technology for differentiated instruction and how to

use technology resources in general (67% and 66%, respectively). Some participants also took the opportunity to provide feedback on additional topics, as shown in the *other* responses.

**Table 30. Teacher needs for professional development**

PD Topics	n	%*
Understanding why technology integration in the classroom is important for student 21st century skill development	42	18.1%
Understanding how to use technology resources	152	65.5%
Understanding how technology can be used to differentiate instruction for students	155	66.8%
Understanding effective classroom management strategies when using technology in the classroom	91	39.2%
Understanding how to get access to technology resources for my classroom	121	52.2%
Understanding how to implement blended learning	126	54.3%
Understanding how to design and develop online courses (to be used for either full online courses or course content for blended learning)	80	34.5%
Understanding how to utilize Google Classroom or Office 365 Education	129	55.6%
Other	10	4.3%
<b>If other, please specify: (n=10)</b>		
<ul style="list-style-type: none"> <li>• Access to help after professional development</li> <li>• Understanding the technological resources available to me related to my discipline</li> <li>• Time to learn and implement</li> <li>• Each student should have the device<sup>4</sup></li> <li>• Understanding how to utilize tools like Twitter that are blocked more effectively.</li> <li>• How to use technology for interdisciplinary</li> <li>• Being informed of what is available in district and then trained to utilize available resources</li> <li>• What to do with kindergarten</li> <li>• Knowledge of the technology that is available to schools</li> <li>• Funding for technology that is pertinent to my subject area</li> </ul>		

\*Respondents were able to select all topics that apply; therefore, sum of percentages will not equal 100.

Statistically significant differences were found between teachers at smaller and larger districts, with those from smaller districts wanting help in “Understanding how to utilize Google Classroom or Office 365 Education.” Additionally, teachers at schools with a high percentage of students eligible for free or reduced-price lunch wanted more professional development to help in “Understanding how technology can be used to differentiate instruction for students.” After correcting for the number of analyses conducted, however, these results were no longer statistically significant. These results can be reviewed in Table 31.

**Table 31. Differences in teacher needs for professional development**

Question	District Size	n	Percent	X2	p
Understanding how to utilize Google Classroom or Office 365 Education	Small	304	28%	5.83	0.02*
	Large	232	19%		
Question	FRL	n	Percent	X2	p
Understanding how technology can be used to differentiate instruction for students	Low	312	0.25	4.42	0.04*
	High	310	0.34		

Note: Using a Bonferroni Correction p must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

Approximately half of the respondents had completed professional development on integrating technology for student Digital Learning ( $n = 263$ ). Teachers rated outcomes of the professional development including their confidence, use of technology resources, and understanding of differentiated instruction using technology. On average, teachers indicated that they *somewhat agree* that the professional development gave them confidence to implement students Digital Learning ( $M=4.42, SD=1.01$ ) and helped them understand how to use technology for differentiated instruction ( $M=4.40, SD=1.05$ ). With a mean score of 4.49, teachers also tended to *somewhat agree* that they increased their use of technology resources in the classroom as a result of the professional development they attended. Descriptive statistics are presented in Table 32. Using an analysis of variance, no statistically significant differences between teachers were found regarding professional development outcomes.

**Table 32. Teacher perceptions of professional development**

PD Outcomes	M	SD
The professional development gave me confidence to implement digital student learning.	4.42	1.01
The professional development increased my use of technology resources in the classroom.	4.49	1.03
The professional development helped me understand how to use technology to differentiate instruction for students.	4.40	1.05

Note: Scale is (1) *strongly disagree*, (2) *somewhat disagree*, (3) *disagree*, (4) *somewhat agree*, (5) *agree*, (6) *strongly agree*

A third of the teachers (33%) indicated that their school had the financial resources to meet their goals around Digital Learning. Approximately 38% of respondents felt their schools had some of the resources to meet their goals, whereas 29% reported their school does not have adequate financial resources. These participants were asked to identify the barriers to obtaining the necessary financial resources and the goals in which they believe they could meet with such sufficient funds. Most of the teachers attributed these barriers to insufficient monies allocated to technology and Digital Learning advancements. Respondents frequently added that the state made budget reductions; in some cases, due to a decrease in student enrollment. Teachers believed the budgets are “tight” and do not allow for them to purchase the desired technology or maintain current resources. Many respondents added that their financial resources are often used for other necessities in the school building and there is not enough money to improve Digital Learning software and strategies. Some teachers reported that other aspects of the school budget (e.g., personnel, facilities, school services, etc.) would suffer if they had to use current funds to resolve their technological needs.

Teachers identified specific areas where financial resources could improve Digital Learning implementation. Respondents indicated that their school or district did not have sufficient funds to provide computer labs or provide tablets to all students, nor did their school or district have funds to support specific programs they would like to implement in their classrooms. Teachers reported that schools lack technology altogether or that updates or additional devices are needed to fully meet their implementation goals. Some teachers noted that the state does not support the schools in maintaining current technology due to the expensive nature of products and restrictions on financial

distributions. Respondents reported that students would benefit from exposure to multiple platforms and online resources to develop content and technical skills.

As previously discussed, teachers identified equipment needs as a barrier to Digital Learning implementation. The respondents stated that additional financial resources could support schools and districts in improving the ratio of computers or tablets per student. Additionally, they would aim to enhance in-school connectivity (i.e., network bandwidth), the use of differentiated learning strategies, and improved classroom management through the acquisition of technology services. Teachers also stated that they would like to develop a long-term strategic plan for sustainability, district and administrative support, and ongoing professional development. Respondents believed that additional financial resources would support teachers to attend more training on integrating technology into their classrooms. This could also help to create a blended learning environment for students.

### Teacher Focus Groups

During focus group sessions, teachers expanded on the barriers they faced in meeting their goals for Digital Learning. Participants mentioned that a lack of devices, issues with connectivity, limited professional development, and funding were the most salient barriers. In regard to devices, teachers wanted more devices for students and educators. While all schools provided students and teachers access to devices like iPads, Chromebooks, desktop computers, and other tools, not all schools had a one-to-one ratio. As one teacher explained, “we have a lot of great technology at our fingertips, but everybody has to check it in and check it out and try not to overlap with other people.” Another teacher went on to say “Even a few classroom computers would be nice. If each classroom had a couple of their own desktops or laptops that just stayed in your room that would be something that would be helpful.”

Teachers also explained, however, that just getting additional devices is not enough. Because devices break, or have intermittent issues, district support is key in making sure that devices are actually working properly. As one teacher elaborated, “I feel that’s part of the state and the district’s responsibility to make sure that teachers are prepared and the resources are available and situated.” Participants believed that, in the past, educators and other school staff have been held responsible for updating and maintaining the classroom technology; “it’s our responsibility to manage and maintain technology and upgrade and maintain everything,” as one teacher described. Teachers felt that they were not always up to meeting this challenge because professional development on technology maintenance has not typically been provided. This sentiment was captured by a teacher who said, “If they want us using technology, then they’re going to need to provide us with access and training in order to do that. Not just encourage us to implement it.”

More professional development for implementation, troubleshooting problems, and technology integration would help teachers to meet their Digital Learning goals, participants explained. Without the proper professional development, teachers felt that they could not utilize the technology available to them to its greatest potential. As one teacher described, “It would be great to have even like a one-stop shop, that the WDE provides, that allows educators to understand how certain technologies work, and how they can be successfully implemented into the classroom.” Such professional development opportunities would greatly enhance technology integration.

Teachers also explained that the internet access at schools prevents greater implementation of technology resources. Many of the participants talked about how school Wi-Fi is slow. This causes problems when teachers attempt to integrate online components into their instruction. For instance, one teacher explained, “We need better Wi-Fi, it's building per building. This building has Wi-Fi down spots that aren't powerful enough for the classroom. In this building we need better equipment. We need some kind of equality for equipment.” To integrate Digital Learning into the classroom, better internet access is a must, teachers believed.

Finally, teachers also felt that funding was a barrier they faced in meeting their goals for Digital Learning. Participants felt that without the proper funding, one-to-one technology, maintenance, professional development, and connectivity issues would be difficult to resolve. As one participant explained,

*It all comes down to funding this initiative. Unless you go into it saying that yes, we're going to do this technology initiative, knowing that you're going to be throwing some serious money at it. Going into it thinking: okay, let's do this, but we are not going to try to save a little money here, it never works with technology to try to cut corners. You have to either go all in or not do it.*

### Student Focus Groups

Students' explanations of barriers they faced in using technology focused on the need for more devices, connectivity, and troubleshooting technology. In regard to more devices, students explained that they would like access to one-to-one technology. Students felt that there were not enough devices to go around, which impacted their learning. Students also felt that their computers and other devices were out of date. As one student explained,

*There's also some problems we're having. Like kids are messing with their computers and they're shutting down, and their computers are getting really old so they aren't working. So I think we should get newer computers because these are getting so old. They just die and their battery doesn't last the whole day; we have to charge it during the day, like at recess and stuff. So that sometimes takes away stuff from our class.*

Students talked about how the internet access at their schools sometimes got in the way of learning. Low internet speeds and a lack of ability to connect were cited as the main issues for connectivity problems. One student stated, “And sometimes – this happens a lot to me – whenever I'm on my school laptop, it's not connected to the internet and then I have to go through a couple of minutes of waiting for it to connect. And then I just wish that we had a constant connection with the internet – with the router.” Students felt that if the internet was faster and more reliable in their schools, learning would be improved as they could use the technology as it was intended to be used. This would lead to better use of technology for class assignments, connecting with students, and meeting learning objectives.

Students did explain, however, that their teachers and other students could help if problems arose with their classroom technology. As one student explained, “I would just go to my teacher or, if there's a substitute that doesn't know what to do, I would go to another teacher that would know what to do.” When teachers could not help, students felt as though they could ask their peers for help. For instance, one student participant said, “Sometimes, another student can help another

student that's not good with technology.” These supports helped students feel as if they could troubleshoot problems when necessary.

### Listening Tour

While the findings summarized above resonate with descriptions of barriers to the implementation of Digital Learning offered by Listening Tour participants, Listening Tour participants identified equipment needs, internet connectivity, and internet availability as far more significant and pervasive barriers than student cooperation. They also expressed the opinion that a lack of material infrastructure poses the greatest obstacle to the implementation of Digital Learning in Wyoming classrooms.

“Technology is expensive,” commented a respondent, “and so not everybody is able to upgrade Wi-Fi systems around all the iPads, not everybody is able to buy iPads for all the kids. There are definitely limits.” Another responded,

*If you look across the state, we are so far behind on this. Where we live, in the middle of nowhere, having access to an internet connection sometimes is hard to do. I mean unless you know somebody that knows somebody. Where I live, and I live a mile from the end of the pavement, it took, geez, ten years before I was able to finally get fast internet access.*

Participants indicated that many students attend small schools situated in remote locations, often resulting in the schools being overlooked and not receiving the supports they need. “We don't get much Digital Learning at my kids' school,” revealed a Listening Tour respondent, who continued by noting, “They go to a rural school in the mountains with only nine kids, one teacher, and an administrator.” Others communicated frustration due to their schools even lacking the ability to connect to the internet, with one commenting, “Our students have technology requirements in their curriculum that they are missing out on.”

Respondents communicated that the quality of programs offered through Digital Learning is irrelevant if students lack the ability to access the internet and utilize online resources. “Some areas barely have internet,” reported a participant, “They have to be able to access the internet. We need better infrastructure throughout the state.” Listening Tour participants expressed the opinion that additional funding is essential in securing accessibility to Digital Learning opportunities for remote students, indicating that rural schools often go financially unsupported as a result of their small enrollment numbers:

*We've got some elementary schools in town that even struggle to do maintenance and upkeep on the machines they have, schools that have ten or twelve kids and don't have any funding to go towards that. We used to have some distance classes and we had to shut them down because of the rules about who's going to pay for what.*

Related to funding, several Listening Tour participants communicated that they believe some of the current regulations and policies across the state are hindering the implementation of Digital Learning. One of these participants explained,

*In our district, we had kids that were alternative high school students taking classes from our teacher at a regular high school. And so many rules came into play there, just, "Oh, nope; they can't do that. Nope, we don't count that as a class. No, that's not ADM." It's not my student then. It's just ridiculous so they stopped doing it. And they were doing it at a time when we didn't have the broadband and the access to the internet that we do now. And now there's more than ever, and it's not used at all. Regulations have become a very big hindrance.*

Respondents suggested that the state could play a significant role in alleviating the burdens of overregulation that many Digital Learning educators are experiencing. Another participant commented,

*If the state plan could get rid of that red tape in there, I mean the network is there, the schools are there, the colleges are all on the network. Kids could be taking college classes in high school. The network that is there between all the school districts is ready to go. It's the red legislative tape that is in the way of learning taking place. Why do we have to have X number of minutes of seat time for a kid to get a credit? And, again, that's back to the regulations that tell us that we have to have certain things that we [have] to do in order for a kid to get a credit.*

Additionally, Listening Tour participants indicated that, in situations where technology and material infrastructure was available, they perceive it as being either inefficiently or inappropriately incorporated into classroom instruction as a result of teachers' lack of experience with and/or resistance to technology. As previously mentioned, Listening Tour participants reported that technology is available, but training can be time consuming. Additionally, some teachers may be resistant to experimenting with Digital Learning implementation due to an unwillingness to learn new tools or frustration with technological barriers.

### Current and Desired Technology Integration

Respondents also indicated whether their districts or schools were currently implementing, planned to implement, or would like to implement various types of technology for student Digital Learning. The 12-item Digital Learning implementation scale consists of devices, software, and programs to support their school staff's professional practices. Each group could select the option to best describe their implementation practices or plans, including (1) *no interest in and no plans for implementing*, (2) *would like to be implemented but no plans in the next year*, (3) *plan to be implemented in the next year*, or (4) *already implemented*. If selected, each group was also asked to identify their current, planned, or preferred software for learning management. A Learning Management systems (LMS) is a software application utilized in administration tasks, such as tracking, documenting, reporting, and delivering technology courses for educational purposes. Administrators and teachers were also asked to rate their experiences with various technology resources based on their professional practices.

#### District staff

Table 33 displays the findings for district-reported implementation status of Digital Learning opportunities. Overall, district staff reported that they have varied interest and plans for

implementing technology tools for Digital Learning. Smartboards ( $M=3.82$ ,  $SD=0.65$ ) and student computer labs ( $M=3.80$ ,  $SD=0.73$ ) received the highest ratings, in which district staff have plans to implement or have already implemented the technology. District staff tended to be interested or have plans to implement individual student laptop computers ( $M=2.50$ ,  $SD=1.19$ ) and LMSs ( $M=2.54$ ,  $SD=1.17$ ). They also expressed interest in implementing operating system tablets ( $M=2.26$ ,  $SD=1.16$ ) and desktop computers ( $M=2.16$ ,  $SD=1.39$ ), though plans are not in place for the next year. More than half of the participants reported that students may take district-supplied equipment home (54%).

**Table 33. District-reported Digital Learning implementation**

Technology for Digital Learning	n	M	SD
Smartboards	97	3.82	0.65
Software to support curriculum and instruction (e.g., Google Apps, MyMathLab, Edgenuity, etc)	95	3.72	0.60
Student computer lab	97	3.80	0.73
Web conferencing	85	3.14	1.11
Desktop computers in classrooms	87	2.84	1.39
Limited supply of student laptop computers	93	3.54	0.95
Limited supply of student iPad tablets	93	3.39	1.08
Limited supply of student other operating system tablets	89	3.01	1.26
Individual student laptop computers (1:1)	90	2.50	1.19
iPad tablets or other operating system tablets (e.g. Chromebook) (1:1)	90	2.74	1.16
Learning Management System	87	2.54	1.17

Note: Scale is (1) no interest in and no plans for implementing, (2) would like to be implemented but no plans in the next year, (3) plan to be implemented in the next year, (4) already implemented

Staff from smaller school districts were more likely to report that they had plans to implement a limited supply of student laptop computers. When controlling for family-wise error, however, these differences were no longer significant. Yet, district staff with 6 to 10 years of experience were most likely to report that they had plans to implement a limited supply of student laptop computers. These results can be reviewed in Table 34.

**Table 34. Differences in district-reported Digital Learning implementation**

Question	District Size	n	M	SD	F	p
Limited supply of student laptop computers	Small	38	1.63	1.10	4.62	0.04*
	Large	45	1.31	0.76		
Question	Years of Experience	n	M	SD	F	p
Limited supply of student laptop computers	1 to 3 Years	33	1.36	0.82	3.94	0.01
	4 to 5 Years	10	1.60	1.27		
	6 to 10 Years	23	1.74	1.14		
	11 or More Years	27	1.30	0.78		

Note: Using a Bonferroni Correction p must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

Of the 78 respondents, 28 district staff (45.2%) reported they do not know what they are currently implementing, plan to implement, or prefer among LMSs. These individuals were excluded from the percentage calculation in Table 35. District staff reported varied LMSs used in their districts. Schools utilize Schoology (27%) and Canvas (21%) for learning management, and some added that Google Classroom is their current or preferred LMS software used for their schools ( $n = 6$ ).

**Table 35. Districts’ current, planned, or preferred Learning Management system**

Learning Management Systems	n	%
Schoology	9	26.5%
Canvas	7	20.6%
Moodle	~	~
Blackboard	~	~
Other	12	35.3%

Note: “~” indicates cell suppression due to  $n < 4$ . The cell with the next smallest size was also suppressed to maintain confidentiality.

### Administrators

Based on mean scores, administrators appeared to have a high interest in implementing individual laptop computers ( $M=2.25$ ,  $SD=1.17$ ), a limited supply of operating system tablets ( $M=2.30$ ,  $SD=1.32$ ), web conferencing ( $M=2.28$ ,  $SD=1.18$ ), and LMSs ( $M=2.35$ ,  $SD=1.21$ ). Administrators indicated they had plans to implement or are already implementing smartboards ( $M=3.85$ ,  $SD=0.58$ ), software to support curriculum and instruction ( $M=3.69$ ,  $SD=0.65$ ), and student computer labs ( $M=3.69$ ,  $SD=0.88$ ). All findings are shown in Table 36.

For administrators who indicated that they already implement iPads or other operating system tablets, the majority of the respondents reported that students are permitted to take the school-supplied equipment home (55%). Similarly, administrators who plan to implement or would like to implement such technology were asked whether students would be able to take the equipment home. Of the 65 administrators who responded to this item, 74 percent reported that the school-supplied equipment would not be taken home by students.

**Table 36. Administrator-reported Digital Learning implementation**

Technology for Digital Learning	n	M	SD
Smartboards	124	3.85	0.58
Software to support curriculum and instruction (e.g., Google Apps, MyMathLab, Edgenuity, etc)	123	3.69	0.65
Student computer lab	121	3.69	0.88
Web conferencing	118	2.28	1.18
Desktop computers in classrooms	118	2.62	1.41
Limited supply of student laptop computers	119	3.43	1.02
Limited supply of student ipad tablets	119	3.07	1.22
Limited supply of student other operating system tablets	115	2.30	1.32

Technology for Digital Learning	n	M	SD
Individual student laptop computers (1:1)	119	2.25	1.17
iPad tablets or other operating system tablets (e.g. Chromebook) (1:1)	118	2.59	1.20
Learning Management System	115	2.35	1.21

Note: Scale is (1) no interest in and no plans for implementing, (2) would like to be implemented but no plans in the next year, (3) plan to be implemented in the next year, or (4) already implemented

School administrators in larger districts were more likely to report that their plans for implementing Digital Learning included a student computer lab. However, those administrators in smaller school districts were more likely to report that their plans for implementing Digital Learning include, individual student iPad tablets or other operating systems e.g. Chromebook. Those administrators with 11 or more years of experience were more likely to report that their Digital Learning plans included a limited supply of student laptop computers when compared to other administrators. Lastly, participants at schools with a high percentage of students eligible for free or reduced-price lunch were more likely to report that their plans for Digital Learning implementation included a learning management system. However, after a correction for family-wise error, only one comparison was statistically significant (iPad tablets or other operating systems e.g. Chromebook (1:1) for administrators in small school districts). These results can be reviewed in Table 37.

**Table 37. Differences in administrator-reported Digital Learning implementation**

Question	District Size	n	M	SD	F	p
Student computer lab	Small	50	1.22	0.76	5.22	0.03*
	Large	71	1.37	0.96		
iPad tablets or other operating systems e.g. Chromebook (1:1)	Small	49	2.53	1.24	7.44	0.01
	Large	69	2.32	1.17		
Question	Years of Experience	n	M	SD	F	p
Limited supply of student laptop computers	1 to 3 Years	50	1.52	1.00	3.02	0.04*
	4 to 5 Years	13	1.46	0.97		
	6 to 10 Years	24	1.50	0.98		
	11 or More Years	32	1.75	1.14		
Question	FRL	n	M	SD	F	p
Learning Management System	Low	55	2.31	1.25	4.51	0.04*
	High	53	2.94	1.21		

Note: Using a Bonferroni Correction p must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*\*” are no longer significant after the Bonferroni Correction.

Administrators were asked about the availability of individual laptop computers and operating system tablets for individual students. The majority of administrators indicated that laptops (68%) and iPads or other operating system tablets (74%) are available at a one-to-one ratio (i.e., device to student) for all classes and grade levels.

Of the 78 respondents, 27 administrators (45.2%) reported they do not know what they are currently implementing, plan to implement, or prefer among the LMSs. These individuals were not included

in the percentage calculated in Table 38. Some respondents indicated that Canvas (24%) or Schoology (20%) is their current, planned, or preferred LMS. Nearly half indicated they use a software other than those provided.

**Table 38. Administrators current, planned, or preferred Learning Management system**

Learning Management Systems	n	%
Schoology	10	19.6%
Canvas	12	23.5%
Moodle	4	7.8%
Other	25	49.0%

Based on administrators’ experience, respondents were asked to rate the frequency at which they use a variety of technology resources (see Table 39). The 13-item scale ranged from (1) *not at all* to (4) *a great deal*. The overall average for all scale items resulted in a mean score of 2.54 ( $SD=0.50$ ), which indicates that administrators’ *occasionally* or *often* implement technology resources. Administrators *often* used technology to communicate with parents ( $M=3.01, SD=0.78$ ). They also tended to advocate for adequate, timely, and high quality technology support services ( $M=2.86, SD=0.75$ ).

**Table 39. Frequency of administrators’ use of technology resources**

Given your experience as an administrator experience, do you...	n	M	SD
Participate in inclusive district process through which stakeholders formulate a shared vision that clearly defines expectations for technology use?	123	2.19	0.79
Develop a collaborative, technology-rich school improvement plan, grounded in research and aligned with the district strategic plan?	122	2.29	0.84
Promote highly effective practices in technology integration among faculty and other staff?	122	2.61	0.71
Collaboratively design, implement, support, and/or participate in professional development for all instructional staff that institutionalizes effective integration of technology for improved student learning?	122	2.43	0.81
Provide campus-wide staff development for sharing work and resources across commonly used formats and platforms?	122	2.34	0.74
Allocate campus discretionary funds and other resources to advance implementation of the school/district technology plan?	122	2.61	0.80
Advocate for adequate, timely, and high quality technology support services?	121	2.86	0.75
Promote and model the use of technology to access, analyze, and interpret campus data to focus efforts for improving student learning and productivity?	121	2.79	0.74
Implement evaluation procedures for teachers that assess individual growth toward established technology standards and guide professional development planning?	121	2.31	0.79

Given your experience as an administrator experience, do you...	n	M	SD
Include effectiveness of technology use in the learning and teaching process as one criteria in assessing performance of instructional staff?	121	2.43	0.76
Secure and allocate technology resources to enable teachers to better meet the needs of all learners on campus?	121	2.67	0.75
Use technology (e.g. email, Blackboard, text) as a tool for communication with parents?	121	3.01	0.78
Use technology (e.g. email, Blackboard, text) as a tool for communication with students?	120	2.50	0.94
<b>Total</b>	<b>117</b>	<b>2.54</b>	<b>0.50</b>

Note: (1) not at all, (2) occasionally, (3) often, (4) to a great extent

Administrators at larger school districts were more likely to report that they used technology as a tool for communication with parents, when compared to those administrators in smaller school districts. However, after controlling for family-wise error rates, these differences were no longer significant. These results are presented in Table 40. No other statistically significant differences were discovered.

**Table 40. Differences in administrators’ use of technology resources**

Question	District Size	n	M	SD	F	p
In your experience as an administrator, do you use technology (e.g. email, Blackboard, text) as a tool for communication with parents?	Small	53	2.89	0.87	5.83	0.02*
	Large	68	3.10	0.69		

Note: Using a Bonferroni Correction p must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

### Teachers

Teachers indicated that they are currently implementing, plan to implement, or would like to implement various types of technology for student Digital Learning. Overall, teachers tended to either want the technology to be implemented, though plans have not been established, or they plan to implement the Digital Learning strategy in the next year. Table 41 shows the descriptive statistics (i.e., means and standard deviations) for each type of technology. Respondents indicated that Smartboards ( $M=3.67, SD=0.87$ ) and student computer labs ( $M=3.61, SD=0.90$ ) will be implemented next year or are already implemented in their schools. Web conferencing had the lowest score among the technology resources ( $M=1.94, SD=1.07$ ), with the majority of participants stating they do not have interest or do not have plans to implement even if they would like to use the platform.

For teachers who indicated that they already implement iPads or other operating system tablets, the majority of the respondents reported that students may not take the school-supplied equipment home (59%). Similarly, teachers who planned to implement or would like to implement such technology were asked whether students would be able to take the equipment home; the vast

majority also indicated that the school-supplied equipment would not be taken home by students (89%).

**Table 41. Teacher-reported Digital Learning implementation**

Technology for Digital Learning	n	M	SD
Smartboards	514	3.67	0.87
Software to support curriculum and instruction (e.g., Google Apps, MyMathLab, Edgenuity, etc)	492	3.26	1.02
Student computer lab	510	3.61	0.90
Web conferencing	465	1.94	1.07
Desktop computers in classrooms	487	2.36	1.32
Limited supply of student laptop computers	495	3.09	1.16
Limited supply of student iPad tablets	490	2.90	1.24
Limited supply of student other operating system tablets	473	2.12	1.18
Individual student laptop computers (1:1)	484	2.08	1.02
iPad tablets or other operating system tablets (e.g. Chromebook) (1:1)	488	2.53	1.16
Learning Management System	458	2.96	1.05

Note: Scale is (1) no interest in and no plans for implementing, (2) would like to be implemented but no plans in the next year, (3) plan to be implemented in the next year, (4) already implemented

Results showed that teachers in smaller districts had greater self-reported planned use/implementation of the school computer lab in their instruction while teachers at larger schools had greater planned use/implementation of one-to-one computers. In regard to years of experience, teachers with less than one to three years of experience had greater planned use/implementation of iPads and other tablets in the classroom when compared to teachers with more than three years of experience (after a correction for family-wise error, the question about implementing a limited supply of other operating system tablets was no longer significant). In regard to content area, special education teachers had greater self-reported planned use/implementation of iPad tablets when compared to other teachers in other content areas (after a correction for family-wise error this was no longer significant). These results are presented in Table 42.

**Table 42. Differences in teacher-reported Digital Learning implementation**

Question	District Size	n	M	SD	F	p
Student computer lab	Large	222	3.50	1.05	4.95	0.03*
	Small	288	3.70	0.79		
Individual student laptop computers (1:1)	Large	212	2.28	1.10	5.32	0.02*
	Small	271	1.92	0.92		
Question	Years of Experience	n	M	SD	F	p
Limited supply of student iPad tablets	1 to 3 Years	74	3.30	1.00	3.80	0.01
	4 to 5 Years	28	2.82	1.31		

	6 to 10 Years	80	2.98	1.27		
	11 or More Years	304	2.79	1.27		
Limited supply of student other operating system tablets	1 to 3 Years	70	2.36	1.12	2.70	0.05*
	4 to 5 Years	27	2.41	1.92		
	6 to 10 Years	76	1.92	1.13		
	11 or More Years	296	2.08	1.18		
Question	Content Area	n	M	SD	F	p
Limited supply of student iPad tablets	English language arts	67	2.96	1.24	1.92	0.05*
	Mathematics	39	2.62	1.31		
	Science	34	2.44	1.24		
	Social studies	25	2.60	1.32		
	Foreign language	9	2.33	1.32		
	Arts/humanities	24	2.75	1.33		
	Physical education	18	2.67	1.28		
	Technical/trade	22	2.45	1.30		
	Special Education	64	3.09	1.18		
	ELL	~	~	~		
	Talented and Gifted	~	~	~		
	Other (please specify)	177	3.10	1.18		

Note: Scale is (1) no interest in and no plans for implementing, (2) would like to be implemented but no plans in the next year, (3) plan to be implemented in the next year, (4) already implemented

Note: “~” indicates cell suppression due to  $n < 4$ . The cell with the next smallest size was also suppressed to maintain confidentiality.

Note: Using a Bonferroni Correction  $p$  must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

On average, teachers indicated that they planned to implement a LMS software next year ( $M=2.96$ ,  $SD=1.05$ ). The teacher survey aimed to identify which software system(s) teachers are using, plan to use, or prefer for their professional use. Of the 281 respondents, the majority of teachers indicated that they do not know which LMS they prefer to use (51%). Those who are aware of their system(s) ( $n=134^3$ ) selected one of the options shown in Table 43. For the options provided, Schoology was the most common or preferred LMS software. Many of the respondents who selected *other* indicated that Google Classroom and/or Midas are their current or preferred systems for learning management. Other software used by teachers for learning management included Edmodo, PowerSchool, and Whiteboard, though these were less common among respondents.

**Table 43. Teachers’ current, planned, or preferred Learning Management system**

Learning Management Systems	n	%
Schoology	39	29.1%
Canvas	17	6.0%

<sup>3</sup> Some participants ( $n=6$ ) selected *other* but reported that their school is in the process of adopting an LMS software or do not have such technology for implementation. These respondents were excluded from the findings and not counted toward the  $n$  used to calculate the percentages in Table 29.

Learning Management Systems	n	%
Moodle	15	5.3%
Blackboard	6	2.1%
Sakai	~	~
BrainHoney	~	~
Other	54	45.0%

Note: “~” indicates cell suppression due to  $n < 4$ . The cell with the next smallest size was also suppressed to maintain confidentiality.

Teachers were also asked to report the frequency with which they planned, implemented, and evaluated components of their classroom with technology resources. The four-item scale ranged from (1) *not at all* to (4) *a great deal*. The overall average for all scale items resulted in a mean score of 2.70 ( $SD=0.68$ ), which indicates that teachers’ average use of technology resources falls between (2) *occasionally* and (3) *often*. Results by item (see Table 44) show that teachers most frequently felt comfortable choosing technology resources to support instruction ( $M=2.83, SD=0.76$ ), planned for classroom management when students use technology resources ( $M=2.82, SD=0.84$ ), and arrange equal use of technology resources for all students ( $M=2.81, SD=0.85$ ).

**Table 44. Frequency of teachers’ use of technology resources**

In your teaching experience, do you...	n	M	SD
Feel comfortable in your ability to choose technology resources to support instruction?	530	2.83	0.76
Arrange equal use of technology resources for all students?	529	2.81	0.85
Use technology resources in learning activities that are interdisciplinary?	528	2.49	0.85
Plan lessons that effectively integrate technology resources?	523	2.60	0.82
Plan for classroom management when students are to use technology resources?	527	2.82	0.84
Evaluate classroom management when students use technology resources in activities?	527	2.72	0.87
Implement technology resources to facilitate digital learning in your classroom?	528	2.58	0.83
<b>Total</b>	<b>520</b>	<b>2.70</b>	<b>0.68</b>

Note: Scale is (1) *not at all*, (2) *occasionally*, (3) *often*, (4) *to a great extent*

Results from an analysis of variance demonstrated that teachers from schools with a higher percentage of students eligible for free or reduced-price lunches were less likely to arrange equal use of technology resources for all students (these results were no longer significant after controlling for family-wise error). Teachers with self-reported content areas in talented and gifted, social studies, and foreign language were more likely to feel comfortable in their ability to choose technology resources to support instruction and arrange equal use of technology resources for all students, however, these results were no longer significant after controlling for family-wise error. Talented and gifted, social studies, and those who selected “other” as their content area were more likely to use technology resources in learning activities that were interdisciplinary and plan lessons that

effectively integrate technology resources. These differences were statistically significant and can be reviewed in Table 45.

**Table 45. Differences in teachers' use of technology resources**

In your teaching experience, do you...	FRL Percent	n	M	SD	F	p
...arrange equal use of technology resources for all students?	Large	208	2.72	0.85	4.03	0.05*
	Small	307	2.89	0.86		
Question	Content Area	n	M	SD	F	p
...feel comfortable in your ability to choose technology resources to support instruction?	English language arts	74	2.84	0.74	1.89	0.04*
	Mathematics	43	2.79	0.83		
	Science	36	2.86	0.72		
	Social studies	25	3.16	0.75		
	Foreign language	9	3.11	0.60		
	Arts/humanities	27	2.78	0.64		
	Physical education	20	2.35	0.75		
	Technical/trade	23	3.09	0.79		
	Special Education	74	2.50	0.75		
	ELL	~	~	~		
	Talented and Gifted	~	~	~		
	Other (please specify)	185	2.94	0.73		
Question	Content Area	n	M	SD	F	p
...arrange equal use of technology resources for all students?	English language arts	74	2.89	0.77	2.17	0.02*
	Mathematics	42	2.90	0.93		
	Science	36	3.06	0.83		
	Social studies	25	3.12	0.78		
	Foreign language	9	3.11	0.60		
	Arts/humanities	27	2.44	0.85		
	Physical education	20	2.20	0.77		
	Technical/trade	23	3.09	0.67		
	Special Education	74	2.41	0.84		
	ELL	~	~	~		
	Talented and Gifted	~	~	~		
	Other (please specify)	185	2.92	0.84		
Question	Content Area	n	M	SD	F	p
...use technology resources in learning activities that are interdisciplinary?	English language arts	74	2.45	0.86	3.16	0.00
	Mathematics	43	2.28	0.80		
	Science	36	2.25	0.87		
	Social studies	25	2.68	0.90		
	Foreign language	9	2.67	0.71		
	Arts/humanities	27	2.19	0.74		

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	Physical education	19	2.16	0.83		
	Technical/trade	23	2.52	0.90		
	Special Education	73	2.22	0.75		
	ELL	~	~	~		
	Talented and Gifted	~	~	~		
	Other (please specify)	185	2.74	0.83		
<b>Question</b>	<b>Content Area</b>	<b>n</b>	<b>M</b>	<b>SD</b>	<b>F</b>	<b>p</b>
...plan lessons that effectively integrate technology resources?	English language arts	73	2.70	0.78	2.87	0.00
	Mathematics	42	2.50	0.67		
	Science	36	2.58	0.73		
	Social studies	25	3.08	0.70		
	Foreign language	9	2.33	0.71		
	Arts/humanities	27	2.44	0.70		
	Physical education	20	2.10	0.79		
	Technical/trade	23	3.04	0.93		
	Special Education	72	2.28	0.74		
	ELL	~	~	~		
	Talented and Gifted	~	~	~		
	Other (please specify)	182	2.70	0.85		

Note: “~” indicates cell suppression due to  $n < 4$ . The cell with the next smallest size was also suppressed to maintain confidentiality.

Note: Using a Bonferroni Correction  $p$  must be equal to or less than 0.01 for statistical significance. Comparisons with an “\*” are no longer significant after the Bonferroni Correction.

### Teacher Focus Groups

Teachers described a variety of technologies they integrated into their classroom instruction. In particular, teachers focused on technology for Digital Learning (e.g., iPads, Smart Boards, 3D printers, computers, etc.), learning management systems and programs (e.g., Kahoot!, ClassDojo, Edgenuity, My Big Campus, Schoology, etc.). In addition to classroom instruction, teachers also explained how these tools can be used to communicate with parents.

In regard to technology for Digital Learning, teachers explained that they used an assortment of tools in their classroom instruction. Teachers explained that tools such as iPads, Smart Boards, computers, and other devices are regularly integrated into daily activities. One teacher even explained how he had worked with school partners to enhance student opportunities to use technology for class projects,

*I've worked the last year-and-a-half with our local Makers' Space, and I've taken students down there, and to use their laser cutter, vinyl cutter, 3-D printer, and we actually just got a grant to get all of that equipment in our school, so we demolished the old darkroom.*

While not all teachers explained that they had partnered with a community member to integrate more technology, most teachers integrated tools such as tablets regularly, as one teacher explained,

*Our students use the computers or their iPads for different computer programs like Lexia or IXL, Reading A to Z. A lot of our Apps that we use are very interactive for them. They use Handwriting Without Tears so they can practice their letter formations. Reading and sounding out words building letter sound fluency.*

Teachers also talked about the learning management systems and programs they integrated into their classroom practices. Teachers talked about a variety of platforms they used such as Infinite Campus, Dojo, Edgenuity, My Big Campus, and Schoology. As one teacher explained “I’m going to add to that, the Edgenuity, it’s highly differentiated with the math classes, where for every lesson, a student has the option of pre-testing out, if they can demonstrate mastery of that topic.” Another participant explained “so we actually use a lot of a SchoolView program, where all their assignments and everything are on there.” Another teacher explained,

*We use the technology we have available in the best way we can. And we use different programs like Kahoot! and ClassDojo for behavior, but Kahoot is also for formative assessments. And then we always can use our computer lab for our research projects we do, and we use a kid’s based search engine calls Kiddle. Students use Google Docs to create their documents or their research projects. And that’s pretty much what we do in second grade.*

Teachers also talked about how these resources can be used to keep parents and guardians updated. One respondent in particular explained,

*With our Infinite Campus system, we have several parents that are logging in and viewing their students’ grades. They have access to teacher emails. But, the other thing that we’re able to do with the Infinite Campus system is, push out text messages, emails that we have going on here in the school, so that allows us to mass communicate with parents, if we’ve got certain issues.*

Teachers also explained that ClassDojo is used with parents:

*“I know on the ClassDojo there is a written record where parents do communicate back asking questions, or clarifying, or saying thank you, or letting the teacher know what they might need to know with their child the next day.” These platforms helped teachers better engage parents on a regular basis.*

## Student Focus Groups

Students described a variety of technologies their teachers integrated in classroom instruction. Students focused on technology for Digital Learning in the form of devices (e.g., iPads, Chromebook, Smart Boards, 3D printers, Robots, computers, etc.), learning management systems, and programs (e.g., Kahoot!, Dragon Dictation, Connect Me, Prodigy, Schoology, etc.). Students also explained how this technology impacted their learning. In regard to devices, students talked about a variety of devices their teachers used in the classroom. As one student explained “We use iPads to do research and Accelerated Reader.” Another student mentioned, “So, we got to program robots and measure for it and stuff.”

Students also explained that their teachers used a number of different programs and platforms in classroom instruction. This ranged from programs that were used to build skills and practice what was learned in class, to those used to connect with other students and parents such as discussion

boards and data platforms. As one student explained, “Sometimes we go down there and do stuff like IXL and math games and typing things.” Another student reported,

*Mobile Math is like where you have math, reading, and all the stuff, and you can click on one and you can do any one of those. And ActiveExpression, there's ABC or D, and you can click one and it will go up on the screen and then it will show up on the ActivBoard and say if you got it right or not.*

In regard to whether these devices and programs improved classroom learning, most students felt that it had a positive impact. For instance, one student stated, “I think that it's kind of helping us learn more because it kind of like shows us how to do it, like on ActivBoard. I like that it shows us how to do the problem.” Another student went on to explain “I-Excel program helps us with our math or our language arts to kind of learn, like how to divide or in language arts like what's a pronoun...” These quotes highlight the fact that most students did enjoy technology in the classroom. As one participant explained, students wanted “to go on IXL longer, so we can all get smarter and better at using technology.”

Not all students, however, wanted to use more technology in the classroom. Some felt that less technology would actually be better for classroom instruction. This theme was captured by a student who explained that she wanted less technology in the classroom, “Not using only technology. Like instead of typing everything, we could handwrite it.” When talking about his classmates, one student went on to say,

*They're addicted to it [technology] so that's what they sometimes change to and it's hard to get them off of it sometimes. And some people stay in for recess to play it, and that takes away their time to get fresh air and to get all their energy out. And they also play it a lot at home so it's like taking their homework time away and stuff. So I kind of think we should narrow down on the games or something.*

## Listening Tour

Information provided by Listening Tour respondents, for the most part, aligns with findings summarized above. Those who reported that progress has been made with implementation primarily cited specific pieces of technology infrastructure and equipment that have been installed, such as iPads, laptops, Promethean boards, and desktop computers, as well as educational software used in support of curriculum (e.g., Google Apps, MyMathLab, Mathematica, Edgenuity, Education City, etc.). For the most part, technology and equipment implemented varied widely across schools, leading respondents to indicate that they would like to see greater uniformity in the implementation of instructional technology across the state. One respondent explained,

*We need common tools, along with collaboration. There's so much limitation, because my piece of software does something that your piece of software doesn't, and you want it to do mine, the way that we did it. Having a common guidance in the tool set is important.*

Other participants primarily agreed, with one commenting, “Different school districts could definitely back each other up. It's a lot easier said than done, but clear vision and a uniform approach to it all, that is standardized on some things, would go a long way.”

Listening Tour participants were also asked to describe any innovative successes they may have experienced to date in regard to the implementation of Digital Learning and instructional technology. Respondents reported increased success when teachers and faculty were provided the ability to access databases of tools and activities, providing opportunities to exchange best practices with other educators. Participants also reported greater success when the interactivity of students' Digital Learning experience was increased, allowing them to work collaboratively with peers. Several respondents expressed a sense of strong appreciation for the ability to provide rapid-response and comprehensive feedback to students afforded to them by instructional technology and software, such as Google Docs:

*Teachers can look at students' work and the feedback is almost instant, whereas when it was paper and pencil students turned assignments in and had to wait a week. So I think the application has increased the feedback loop, and made it faster, and has allowed kids to apply the feedback to the problem at hand, versus waiting until it's too late.*

“Students are doing a lot more collaborative work,” reported another participant in the Digital Learning Listening Tour, “They're spending a lot less time just sitting there in class writing on a piece of paper. They're working together across classrooms on all kinds of things in just about every subject area.” Several respondents also indicated that students' access to online programs, courses, and resources has allowed for them to connect and collaborate with one another from across the state, receiving opportunities to participate in classes and trainings that would not otherwise be available, particularly for remote students. One participant commented on the benefits of allowing students from different locations to take advantage of different schools' offerings and the potential that it bears for students moving forward: “My student, your student, they're taking classes together. And it could be – you know, it's infinite. You could be learning French from a teacher in France. You know, I think those opportunities are endless for kids.”

### Conclusion

Based on survey responses, teachers felt that Digital Learning is important for student success. District staff, administrators, and teachers felt that the professional development offered through their respective districts prepared school staff to use student Digital Learning. Teachers noted that professional development increased the use of technology resources, gave them confidence to implement student Digital Learning, and helped them understand differentiated instruction strategies through the use of technology. However, district staff, administrators, and teachers reported that more training should be offered on Digital Learning strategies for differentiated instruction. Other recommended topics for professional development included strategies for integrating technology resources, implementing blended learning, and understanding the importance of Digital Learning implementation.

Survey results also revealed that district staff, administrators, and teachers are interested in networking with other educators on Digital Learning implementation. Face-to-face meetings or networking events, online professional learning communities, and district-hosted webinars were among the preferred methods for networking communication. Participants also felt their district and schools would benefit from Digital Learning guidelines and recommendations. The barriers

Wyoming educators experience when implementing Digital Learning strategies should be considered when developing appropriate guidelines and recommendations. Barriers to Digital Learning implementation include equipment needs, problematic LMS connections, and availability of professional development opportunities. Financial barriers also exist for districts and schools. Administrators and teachers felt that the financial barriers they faced were due to state-wide budget cuts or limited availability of funding specific to technology.

In focus groups, teachers explained that they integrated a number of devices and programs for Digital Learning into their classroom practices. This included the use of tablets, laptops, smart boards, 3-D printers and other devices. In terms of programs and applications, participants use IXL, PowerPoint, Google Docs and Kahoot! (among many others). Teachers also explained that they regularly used learning management systems such as SchoolView, Infinite Campus, Blackboard, Edgenuity, and My Big Campus. Although many teachers felt comfortable using these devices, programs, and systems, they explained that more professional development on general technology integration would be helpful. This could include general information on what technology resources are available for a specific program or application such as Office 365.

Teachers' perspectives on how their schools defined technology skills for students differed, ranging from no definition or policy at all to school-wide definitions about technology skills for students aligned to the Common Core State Standards. Regardless of how schools defined technology skills for students, teachers were divided on whether students came prepared with the necessary skills to be successful in a Digital Learning environment. Participants explained that schools serving underprivileged populations often had fewer students prepared to be successful in a Digital Learning environment; in the words of the teachers, a "digital divide" for students. Over the years, this divide has widened, causing difficulties in using Digital Learning approaches in the classroom, especially for those students with little to no internet access or mobile devices available outside school.

Teachers also spent time detailing the major barriers they faced in implementing Digital Learning resources. Connectivity issues—with slow Wi-Fi—was one of the biggest barriers teachers faced on a regular basis. Often, the unreliable internet made technology integration difficult. Outdated devices were also cited as another common issue. Also, a lack of one-to-one technology for all students was cited as a major barrier in implementing Digital Learning. These issues made technology integration unnecessarily difficult for teachers.

Students explained that they used a variety of devices and programs at school, aligning with what was described by teachers. Students enjoy using tablets, smart boards, laptops and computers. Students use different programs and applications in the classroom—and noted that these Digital Learning tools enhanced their experiences in school. However, some students did want breaks from technology, explaining that it is sometimes nice to work with hands-on activities that do not involve devices.

Overall, students felt confident in their abilities to use technology to complete assignments, work with other students, and learn new content. This did not completely align with what teachers said during focus groups, as teachers believed that students were not always prepared. Students explained that their teachers frequently worked with them to improve their typing speed, mathematical proficiency and use of programs for class such as Power Point or Word. Students didn't believe,

however, that their schools or teachers defined what skills students should know in regard to Digital Learning. Instead, students felt that teachers taught them skills related to a program or device they needed to use for a specific class assignment or task, rather than working with students to develop a set of general skills.

Similar to teachers, students also explained that the biggest issues they faced in using technology were connectivity issues, trying to use outdated devices and not enough devices to go around. Students explained that the Wi-Fi connection at their schools was too slow, or failed randomly throughout the day. These circumstances reportedly made it difficult to use programs or devices that require an internet connection. Older and outdated devices also caused problems. Students talked about how computers would crash or freeze. Lastly, students wanted more access to tablets and similar devices. In some schools, the limited supplies of laptops, tablets, and other devices caused scheduling conflicts with other classes and students.

In regard to Listening Tour findings, significant supports are still necessary in the implementation of Digital Learning—interview participants and survey respondents demonstrated strong investment in project goals and a desire to see the Digital Learning implemented. Moving forward, many interview and survey participants stressed the importance of securing the necessary infrastructure to support effective Digital Learning initiatives. Additionally, in instances where infrastructure is available, there appear to be numerous problems with personnel, such as a lack of technical support and/or implementation staff; a hesitance, fear, and/or reluctance from teachers toward using technology in the classroom; and teachers not knowing how to effectively use technology in the classroom. Many Listening Tour participants emphasized the need for professional development opportunities so that teachers can become accustomed to their changing role within Digital Learning environments. Digital Learning has led to a deviation from the traditional instructional model with teachers acting more as facilitators of peer-to-peer collaboration and individualized learning than as lecturers leading whole class instruction.

For the most part, Listening Tour participants expressed a belief that it is essential to integrate technology into classroom instruction in order to prepare students for college and careers, particularly for students in high school who are determining their next steps. Many explained that technology is the major driving force of today's economy, and that many colleges now employ online coursework. As such, failing to expose K-12 students to technology can have significant consequences, as it has become a fundamental component of the "American way" of life. In addition, many interview participants also indicated that the implementation of technology in classrooms provides beneficial supports in teaching students, as well as in engaging students to actively participate in their learning, as many are already invested and interested in technology and related areas (e.g., cell phones, gaming, social media, etc.). Interview participants and survey respondents indicated that, with the necessary infrastructure in place, the provision of online coursework and resources for remote students will be a significant benefit and will connect individuals from across the state to myriad opportunities for learning that would not otherwise be available.

## Appendix A. Survey Items

### District Staff

Dear Wyoming Staff Member,

The purpose of this survey is to gather your perspectives on current practices, attitudes, and beliefs regarding the implementation of digital learning in Wyoming. Your feedback will be used to make informed decisions regarding state policy and procedures for ensuring equitable access to digital learning supports, and how the state will support the implementation of digital learning across districts and schools. Hearing directly from the stakeholders most impacted will ensure the plan directly addresses the real needs of these groups. The survey will take you approximately 15 minutes to complete.

McREL's policy for the protection of participants follows federal rules and regulations. The reports prepared will summarize findings and will not associate responses with a specific individual; direct quotes will not be included in the reports. Your participation in completing this survey is voluntary, and because it is anonymous and questions are not of a sensitive nature, no known risks are associated with completing this survey. You may choose to stop completing the survey at any time. Should you have any questions about this survey, you may call Dr. Adena Miller, McREL Consultant, at 303-632-5530. For information on your rights as a participant, you may call Karen Bumgardner, Managing Researcher and Institutional Review Board Chair at McREL, at 304-347-1841.

Your participation in this survey will help us to continuously improve our schools! Your responses are completely anonymous. Therefore, please be as honest as possible. Thank you for your time and valued feedback.

By clicking the forward arrows and completing this survey, you are consenting to complete the survey as part of the Wyoming Department of Education's with McREL International.

School District (select from the following)

My role is...

- Superintendent
- Assistant Superintendent
- Technology Director

- Director of Curriculum and Instruction  
Special Education Director  
Career and Technical Education Director  
Assessment Coordinator
- Other: \_\_\_\_\_

I have been in my current role for <insert dropdown> years.

I have been in my current role at this district for <insert dropdown> years.

To what extent do you agree with the following statements? (choices: strongly disagree, somewhat disagree, disagree, somewhat agree, agree, strongly agree, does not apply/do not know)

- My district has a process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.
- My district has a strategic plan for student digital learning.
- My district is implementing its strategic plan for student digital learning.
- My district offers professional development to school staff to use student digital learning.
- The professional development my district offers adequately prepares school staff to use student digital learning (e.g. online and formative assessments, resources, software, assistive technology, learning platforms).
- The schools in my district have a set of commonly used formats and/or platforms (e.g., all use Apple or Microsoft, all use MyMathLab, etc).

Are you interested in networking with other educators in Wyoming regarding student digital learning?

- Yes
- Maybe
- No

<If yes or maybe> Which would be your preferred method of communication?

- Face-to-face meetings, networking events
- Online PLC (e.g., via Edmodo)
- Content management system (e.g., Campus Suite, dotCMS)

- Webinars hosted by districts sharing their success stories, best practices, etc.
- Other \_\_\_\_\_

Would identified digital learning guidelines and recommendations be helpful to your district?

- Yes
- No
- Unsure

Are there distance education courses that are not already offered from which students in your district would benefit?

- Yes
- No

<If yes>What types of distance education courses would be of interest? (select all that apply)

- Advanced Placement courses
- Hathaway Success Curriculum
- Gifted and Talented courses
- Foreign language courses
- Technical courses
- Other: \_\_\_\_\_

Does your district have an interest in learning how to develop online courses?

- Yes
- Maybe
- No

To what extent does your district experience barriers to implementing digital learning in your district?

- No barriers
- Some barriers
- A lot of barriers
- We have not implemented digital learning in my district

<If some or a lot of barriers> *Other than financial limitations*, what are current barriers to implementing digital learning in your district?

- Equipment needs (e.g., computers, smart boards)
- Internet connectivity (We have internet, but the connectivity is problematic)
- Internet availability (We don't have the internet we need)
- Availability of or appropriate professional development for district or school staff
- School buy-in
- Other \_\_\_\_\_

<If availability of or appropriate professional development selected> What type of professional development would help district or school staff feel more effective or comfortable with implementing digital learning in the classroom? (check all that apply)

- Understanding why technology integration in the classroom is important for student 21<sup>st</sup> century skill development
- Understanding how to use technology resources
- Understanding how technology can be used to differentiate instruction for students
- Understanding classroom management strategies when using technology in the classroom
- Understanding how to get access to technology resources for my classroom
- Understanding how to implement blended learning
- Understanding how to design and develop online courses (to be used for either full online courses or course content for blended learning)
- Understanding how to utilize Google Classroom or Office 365 Education
- Other \_\_\_\_\_

Given the district's goals around digital learning, does your district have enough financial resources to meet those goals?

- Yes
- Somewhat
- No

<If somewhat or no> What are the barriers to having financial resources? (open ended response)

<If somewhat or no> What goals would you like to meet for which you do not have sufficient financial resources? (Open ended response)

Please indicate which of the following are *already implemented*, *plan to be implemented in the next year*, *would like to be implemented (but no plans in the next year)*, or *no interest in and no plans for implementing* in the schools in your district.

- Smartboards
- Software to support curriculum and instruction (e.g., Google Apps, MyMathLab, Edgenuity, etc)
- Web conferencing
- Student computer lab
- Desktop computers in classrooms
- Limited supply of student laptop computers
- Limited supply of student ipad tablets
- Limited supply of student other operating system tablets
- Individual student laptop computers (1:1)
- Individual student ipad tablets (1:1)
- Individual student other operating system tablets (e.g., Chromebook)
- Learning Management System
- None of the above

<If Learning Management System is selected as already implemented, plan to be implemented, or would like to be implemented> What is your current, planned, or preferred Learning Management system?

- Canvas
- Schoology
- Blackboard
- Moodle
- Brightspace
- BrainHoney
- Sakai
- Do not know
- Other: \_\_\_\_\_

May students take district-supplied equipment home?

- Yes
- No
- Does not apply

## Administrators

Dear Wyoming Staff Member,

The purpose of this survey is to gather your perspectives on current practices, attitudes, and beliefs regarding the implementation of digital learning in Wyoming. Your feedback will be used to make informed decisions regarding state policy and procedures for ensuring equitable access to digital learning supports, and how the state will support the implementation of digital learning across districts and schools. Hearing directly from the stakeholders most impacted will ensure the plan directly addresses the real needs of these groups. The survey will take you approximately 15 minutes to complete.

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Your participation in this survey will help us to continuously improve our schools! Your responses are completely anonymous. Therefore, please be as honest as possible. Thank you for your time and valued feedback.

By clicking the forward arrows and completing this survey, you are consenting to complete the survey as part of the Wyoming Department of Education's work with McREL International.

School District (select from the following)

<Based on district> School (select from the following)

My role is...

- Principal
- Assistant Principal
- Technology Facilitator
- Media Coordinator/Assistant

- Instructional Coach
- Other:

I have been in my current role for <insert dropdown> years.

I have been in my current role at this school for <insert dropdown> years.

To what extent do you agree with the following statements? (choices: strongly disagree, somewhat disagree, disagree, somewhat agree, agree, strongly agree, does not apply/do not know)

- My school has a process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.
- My school has a strategic plan for student digital learning.
- My school is implementing its strategic plan for student digital learning.
- My school offers professional development to school staff to use student digital learning.
- The professional development my school offers adequately prepares school staff to use student digital learning.
- The classrooms in my school have a set of commonly used formats and/or platforms (e.g., all use Apple or Microsoft, all use MyMathLab, etc).

Are you interested in networking with other educators in Wyoming regarding student digital learning?

- Yes
- No

<If yes> Which would be your preferred method of communication?

- Face-to-face meetings, networking events
- Online PLC (e.g., via Edmodo)
- Content management system (e.g., Campus Suite, dotCMS)
- Webinars hosted by districts
- Other \_\_\_\_\_

Would identified digital learning guidelines and recommendations be helpful to your school?

- Yes
- No
- Unsure

[From the NC State University Profile for Administrators NETS\*A]\*

In your experience as an administrator, do you... (choices: not at all, occasionally, often, to a great extent)

...participate in inclusive district process through which stakeholders formulate a shared vision that clearly defines expectations for technology use?

...develop a collaborative, technology-rich school improvement plan, grounded in research and aligned with the district strategic plan?

...promote highly effective practices in technology integration among faculty and other staff?

...collaboratively design, implement, support, and/or participate in professional development for all instructional staff that institutionalizes effective integration of technology for improved student learning?

...provide campus-wide staff development for sharing work and resources across commonly used formats and platforms?

...allocate campus discretionary funds and other resources to advance implementation of the school/district technology plan?

...advocate for adequate, timely, and high quality technology support services?

...promote and model the use of technology to access, analyze, and interpret campus data to focus efforts for improving student learning and productivity?

...implement evaluation procedures for teachers that assess individual growth toward established technology standards and guide professional development planning?

...include effectiveness of technology use in the learning and teaching process as one criteria in assessing performance of instructional staff?

...secure and allocate technology resources to enable teachers to better meet the needs of all learners on campus?

...use technology (e.g. email, Blackboard, text) as a tool for communication with parents?

...use technology (e.g. email, Blackboard, text) as a tool for communication with students?

Are there distance education courses that are not already offered from which students in your school would benefit?

- Yes
- No

<If yes>What types of distance education courses would be of interest? (select all that apply)

- Advanced Placement courses

- Hathaway Success Curriculum
- Gifted and Talented courses
- Foreign language courses
- Technical courses
- Other: \_\_\_\_\_

Does your school have an interest in learning how to develop online courses?

- Yes
- Maybe
- No

To what extent does your school experience barriers to implementing digital learning in your school?

- No barriers
- Some barriers
- A lot of barriers
- We have not implemented digital learning in my school

<If some or a lot of barriers> *Other than financial limitations*, what are current barriers to implementing digital learning in your school?

- Equipment needs (e.g., computers, smart boards)
- Internet connectivity (We have internet, but the connectivity is problematic)
- Internet availability (We don't have the internet we need)
- Availability of or appropriate professional development for school staff
- Insufficient technical support staff
- Teacher/staff buy-in
- Other \_\_\_\_\_

<If availability of or appropriate professional development selected> What type of professional development would help school staff feel more effective or comfortable with implementing digital learning in the classroom? (check all that apply)

- Understanding why technology integration in the classroom is important for student 21<sup>st</sup> century skill development
- Understanding how to use technology resources
- Understanding how technology can be used to differentiate instruction for students
- Understanding classroom management strategies when using technology in the classroom
- Understanding how to get access to technology resources for my classroom

- Understanding how to implement blended learning
- Understanding how to design and develop online courses (to be used for either full online courses or course content for blended learning)
- Understanding how to utilize Google Classroom or Office 365 Education
- Other \_\_\_\_\_

Given your school's goals around digital learning, does your school have enough financial resources to meet those goals?

- Yes
- Somewhat
- No

<If somewhat or no> What are the barriers to having financial resources? (open ended response)

<If somewhat or no> What goals would you like to meet for which you do not have sufficient financial resources? (Open ended response)

Please indicate which of the following are *already implemented*, *plan to be implemented in the next year*, *would like to be implemented (but no plans in the next year)*, or *no interest in and no plans for implementing* in the classrooms in your school.

Smartboards

Software to support curriculum and instruction (e.g., Google Apps, MyMathLab, Edgenuity, etc)

- Smartboards
- Software to support curriculum and instruction (e.g., Google Apps, MyMathLab, Edgenuity, etc)
- Student computer lab
- Web conferencing
- Student computer lab
- Desktop computers in classrooms
- Limited supply of student laptop computers
- Limited supply of student ipad tablets
- Limited supply of student other operating system tablets
- Individual student laptop computers (1:1)
- Individual student ipad or operating system tablets (e.g., Chromebook) (1:1)

- Individual student other
- Learning Management System
- None of the above

<If Learning Management System is selected as already implemented, plan to be implemented, or would like to be implemented> What is your current, planned, or preferred Learning Management system?

- Canvas
- Schoology
- Blackboard
- Moodle
- Brightspace
- BrainHoney
- Sakai
- Do not know
- Other: \_\_\_\_\_

<If 1:1 program selected> Indicate the extent to which 1:1 are implemented

- All classes, all grades
- At least one course or one grade

<If 1:1 program selected> May students take school-supplied equipment home?

- Yes
- No

<If 1:1 program not selected> May students take school-supplied equipment home?

- Yes
- No
- Does not apply

## Teachers

Dear Wyoming Staff Member,

The purpose of this survey is to gather your perspectives on current practices, attitudes, and beliefs regarding the implementation of digital learning in Wyoming. Your feedback will be used to make informed decisions regarding state policy and procedures for ensuring equitable access to digital learning supports, and how the state will support the implementation of digital learning across districts and schools. Hearing directly from the stakeholders most impacted will ensure the plan directly addresses the real needs of these groups. The survey will take you approximately 15 minutes to complete.

McREL's policy for the protection of participants follows federal rules and regulations. The reports prepared will summarize findings and will not associate responses with a specific individual; direct quotes will not be included in the reports. Your participation in completing this survey is voluntary, and because it is anonymous and questions are not of a sensitive nature, no known risks are associated with completing this survey. You may choose to stop completing the survey at any time. Should you have any questions about this survey, you may call Dr. Adena Miller, McREL Consultant, at 303-632-5530. For information on your rights as a participant, you may call Karen Bumgardner, Managing Researcher and Institutional Review Board Chair at McREL, at 304-347-1841.

Your participation in this survey will help us to continuously improve our schools! Your responses are completely anonymous. Therefore, please be as honest as possible. Thank you for your time and valued feedback.

By clicking the forward arrows and completing this survey, you are consenting to complete the survey as part of the Wyoming Department of Education's work with McREL International.

School District (select from the following)

<Based on district> School (select from the following)

At what grade level do you teach? (select all that apply)

- K-2
- 3-5
- 6-8
- 9-12

My primary content area is...

- English language arts
- Mathematics
- Science
- Social studies
- Foreign language
- Arts/humanities
- Physical education
- Technical/trade
- Special Education
- ELL
- Talented and Gifted
- Other (please specify) \_\_\_\_\_

I have been teaching for <insert dropdown> years.

I have been teaching at this school for <insert dropdown> years.

How would you rate your overall skill level in the use of a computer?\*

- Novice:** I can turn the computer on, but I don't really know how to use many programs.
- Beginner:** I am able to use some basic functions such as word processing and the Internet.
- Intermediate:** I am able to use many of the programs, but I don't have a lot of experience with them.
- Advanced:** I am able to use many of the programs and have a great deal of experience with them.
- Expert:** I am able to teach others how to use some programs and am able to fix minor problems with my computer when they happen.

To what extent do you agree with the following statements?

(choices: strongly disagree, somewhat disagree, disagree, somewhat agree, agree, strongly agree; does not apply/do not know)

- I desire to implement student digital learning.
- My school has a process through which stakeholders formulate a shared vision that clearly defines expectations for technology use.
- My school has a strategic plan for student digital learning.
- My school is implementing its strategic plan for student digital learning.
- My school offers professional development to school staff to use student digital learning.
- The professional development my school offers adequately prepares school staff to use student digital learning.
- The classrooms in my school have a set of commonly used formats and/or platforms (e.g., all use Apple or Microsoft, all use MyMathLab, etc).
- Use of student digital learning in the K-12 formal school setting is important for student success in the 21<sup>st</sup> Century
- Pre-service training adequately prepared me to effectively implement education technology in the classroom

Are you interested in networking with other educators in Wyoming regarding student digital learning?

- Yes
- No

<If yes> Which would be your preferred method of communication?

- Face-to-face meetings, networking events
- Online PLC (e.g., via Edmodo)
- Content management system (e.g., Campus Suite, dotCMS)
- Webinars hosted by districts
- Other \_\_\_\_\_

Would identified digital learning guidelines and recommendations be helpful to your school?

- Yes
- No
- Unsure

Are you interested in teaching online courses at your school?

- Yes
- Maybe
- No

[From the NC State University Performance Standards for In-service Teachers NETS-T]

*Technology resources are calculators, data collection probes, videos, educational software, web conferencing, email, the Internet, or hardware/equipment.*

In your experience as teacher, do you... (choices: not at all, occasionally, often, to a great extent)

...feel comfortable in your ability to choose technology resources to support instruction?

...arrange equal use of technology resources for all students?

...use technology resources in learning activities that are interdisciplinary?

...plan lessons that effectively integrate technology resources?

...plan for classroom management when students are to use technology resources?

...evaluate classroom management when students use technology resources in activities?

...implement technology resources to facilitate digital learning in your classroom? [not from NC State]

Have you taken any professional development on technology resource integration to implement student digital learning?

- Yes
- No

<If yes>

Please rate the extent to which you agree following statements about the professional development. (choices: strongly disagree, somewhat disagree, disagree, somewhat agree, agree, strongly agree)

The professional development...

...gave me confidence to implement digital student learning.

...increased my use of technology resources in the classroom.

...helped me understand how to use technology to differentiate instruction for students.

To what extent do you experience barriers to implementing digital learning in your classroom?

- No barriers
- Some barriers
- A lot of barriers
- I have not tried implement digital learning in my classroom

<If some or a lot of barriers> *Other than financial limitations*, what are current barriers to implementing digital learning in your classroom?

- Equipment needs (e.g., computers, smart boards)
- Internet connectivity (We have internet, but the connectivity is problematic)
- Internet availability (We don't have the internet we need)
- Availability of or appropriate professional development (i.e., "I need to understand how to implement digital learning effectively")
- Insufficient technical support staff
- Student cooperation
- Other \_\_\_\_\_

<If availability of or appropriate professional development selected> What type of professional development would help you feel more effective or comfortable with implementing digital learning in the classroom? (check all that apply)

- Understanding why technology integration in the classroom is important for student 21<sup>st</sup> century skill development
- Understanding how to use technology resources
- Understanding how technology can be used to differentiate instruction for students
- Understanding effective classroom management strategies when using technology in the classroom
- Understanding how to get access to technology resources for my classroom
- Understanding how to implement blended learning
- Understanding how to design and develop online courses (to be used for either full online courses or course content for blended learning)
- Understanding how to utilize Google Classroom or Office 365 Education
- Other \_\_\_\_\_

Given your school's goals around digital learning, does your school have enough financial resources to meet those goals?

- Yes

- Somewhat
- No

<If somewhat or no> What are the barriers to having financial resources? (open ended response)

<If somewhat or no> What goals would you like to meet for which you do not have sufficient financial resources? (Open ended response)

Please indicate which of the following are *already implemented*, *plan to be implemented in the next year*, *would like to be implemented (but no plans in the next year)*, or *no interest in and no plans for implementing* in your classroom.

- Smartboards
- Software to support curriculum and instruction (e.g., Google Apps, MyMathLab, Edgenuity, etc)
- Web conferencing
- Student computer lab
- Desktop computers in classrooms
- Limited supply of student laptop computers
- Limited supply of student ipad tablets
- Limited supply of student other operating system tablets
- Individual student laptop computers (1:1)
- Individual student ipad or other operating system tablets (e.g., Chromebook) (1:1)
- Learning Management System

<If Learning Management System is selected as already implemented, plan to be implemented, or would like to be implemented> What is your current, planned, or preferred Learning Management system?

- Canvas
- Schoology
- Blackboard
- Moodle
- Brightspace
- BrainHoney
- Sakai
- Other: \_\_\_\_\_

<If 1:1 program selected> Indicate the extent to which 1:1 are implemented

- All classes, all grades
- At least one course or one grade

<If 1:1 program selected> May students take school-supplied equipment home?

- Yes
- No

<If 1:1 program not selected> May students take school-supplied equipment home?

- Yes
- No
- Does not apply

## Appendix B. Focus Group Interview Protocols

### WDE Teacher Focus Group Questions

1. In what ways do you use and integrate technology in your classroom practices?
2. How do you use technology for communication with students and parents?
3. How does your school define the technology skills that students should know and be able to do? In what ways do you teach you these things?
4. Does your school offer online courses? Have you taught any online courses? In what subjects?
5. For those of you who have taught online courses, could the online courses be improved? In what ways?
6. How prepared do you believe your students are to use digital learning resources (e.g. Google Classroom, Office 365 Education, online learning platforms such as Blackboard, Moodle, or Canvas; research tools; conferencing platforms like Adobe Connect, Google Hangouts, Skype, FaceTime, etc.)?
7. What types of professional learning would be helpful for you to improve your use of digital learning tools in the classroom?
8. If you have questions or problems related to technology support, what do you do?
9. What is needed in order for your school to provide students with better access to high quality digital learning experiences (examples may be better access to Wi-Fi and devices, more tech support, or training for teachers)?
10. What is the role of the state and district in ensuring effective digital learning practices are implemented in classrooms?
11. Is there anything we missed you would like to discuss related to digital learning or use of technology in your classrooms?

## WDE Student Focus Group Questions

1. In what ways do your teachers use technology in your school?
2. When you think about your teachers who use technology the best, what kinds of things do they do?
3. What do you wish your school did better with the use of technology?
4. How does your school define the technology skills students should know and be able to do? In what ways do they teach you these things?
5. Does your school offer online courses? Have you taken any of the online courses? In what subjects?
6. For those of you who have taken online courses, could they be improved? In what ways?
7. How prepared do you feel to use digital learning resources (e.g., online learning platforms such as Blackboard, Moodle, or Canvas; research tools; conferencing platforms like Adobe Connect, Google Hangouts, Skype, FaceTime, etc.)?
8. If you have questions or problems when the technology doesn't work as you think it should, what do you do?
9. What is needed in order for your school to provide you with better access to high quality digital learning experiences (examples may be better access to Wi-Fi and devices, more tech support, or training for teachers)?
10. How does learning change when technology is used in your learning?
11. Is there anything we missed you would like to discuss related to digital learning or use of technology in your classrooms?

## Appendix C. Disaggregated Survey Results

### Administrators

**Table C-1. Administrators disaggregated by school size, grade level and FRL**

Group	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	15	12.4%	15	12.4%
2	9	7.4%	24	19.8%
3	28	23.1%	52	42.9%
4	14	11.6%	66	54.5%
5	8	6.6%	74	61.1%
6	14	11.6%	88	72.7%
7	17	14.0%	105	86.7%
8	16	13.2%	121	99.9%*

Group 1 = large school, high FRL, primary; Group 2 = large school, high FRL, secondary; Group 3 = large school, low FRL, secondary; Group 4 = large school, low FRL, primary; Group 5 = small school, low FRL, primary; Group 6 = small school, high FRL, primary; Group 7 = small school, low FRL, secondary; Group 8 = small school, high FRL, secondary

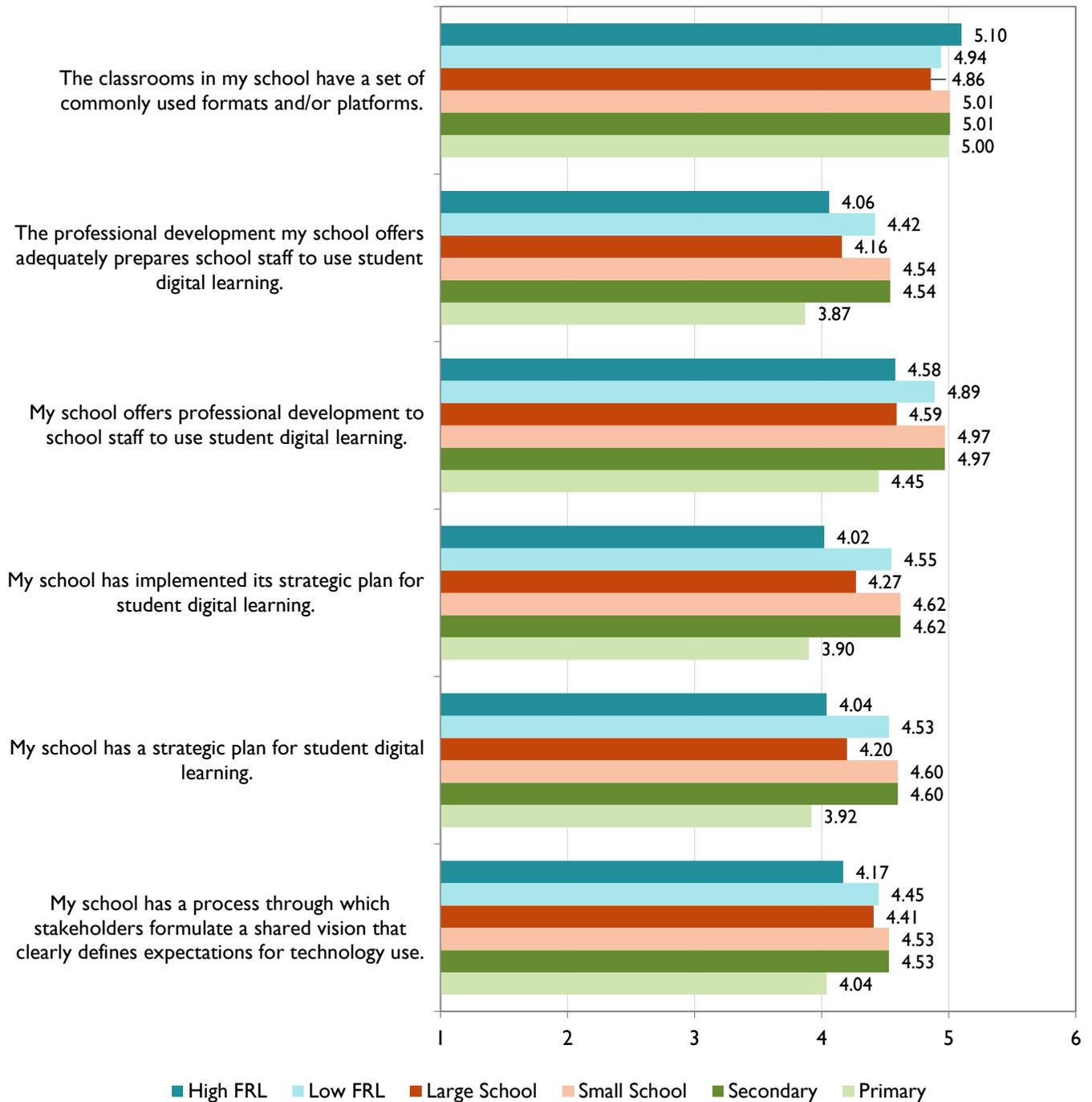
\*Sum of percentages does not equal 100 due to rounding.

Note: There are 7 missing cases.

**Table C-2. Teachers disaggregated by school size, grade level and FRL**

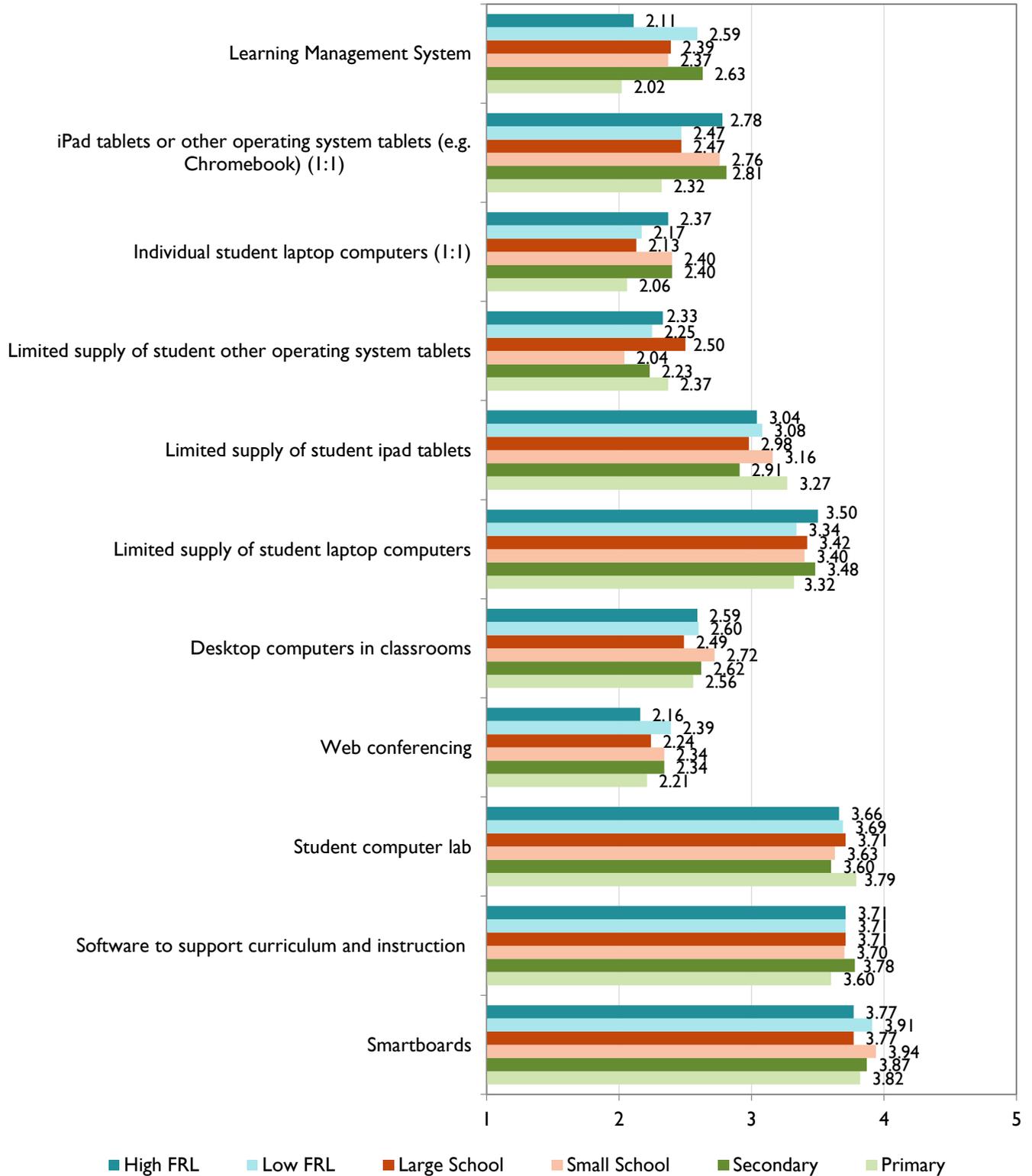
	Primary	Secondary	Small School	Large School	Low FRL	High FRL
Sample size (n)	51	70	55	66	67	54

**Figure C-1. Administrator means for digital learning strategic planning**



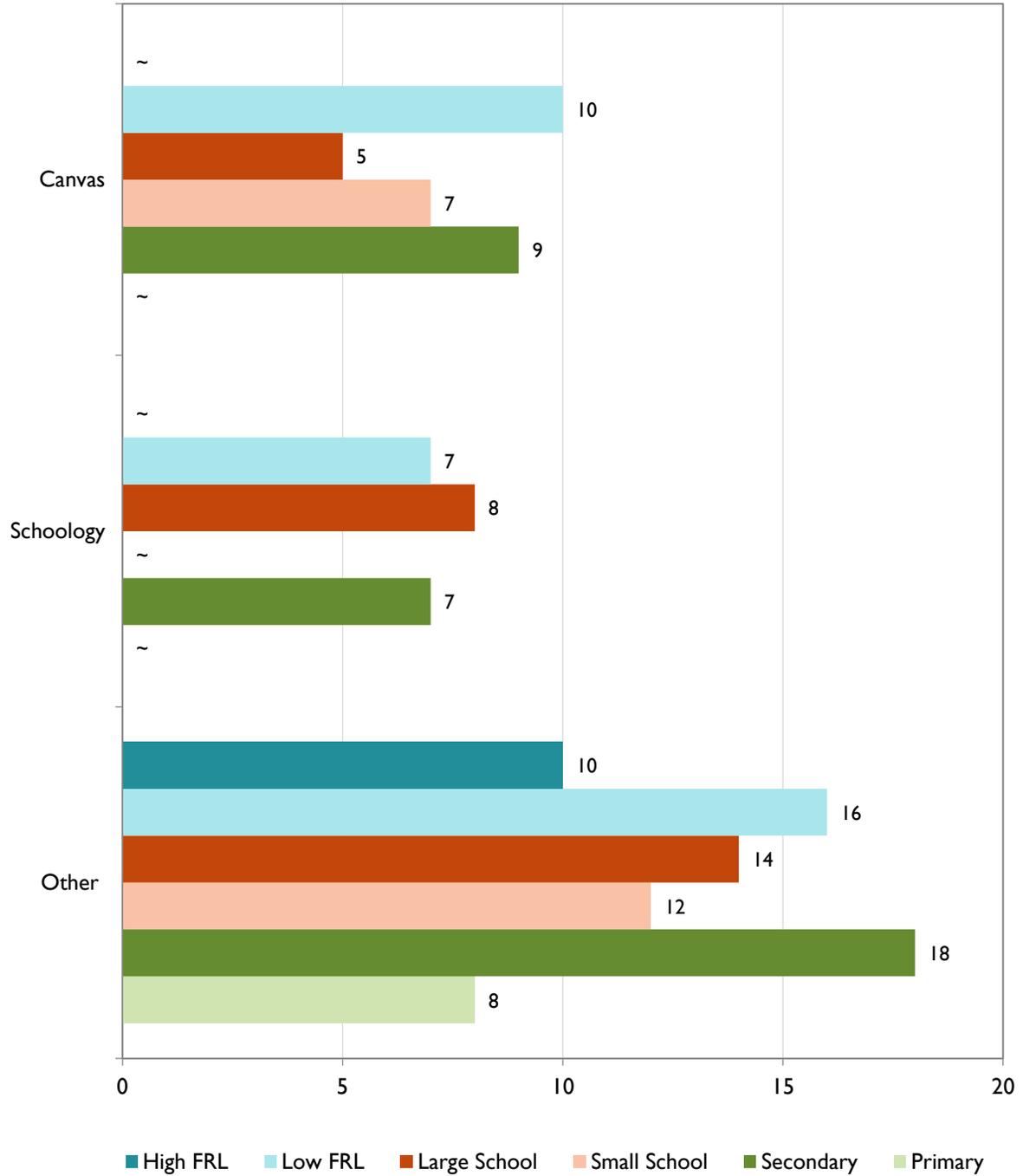
Note: Scale is (1) strongly disagree, (2) somewhat disagree, (3) disagree, (4) somewhat agree, (5) agree, (6) strongly agree

Figure C-2. Administrator means for digital learning implementation



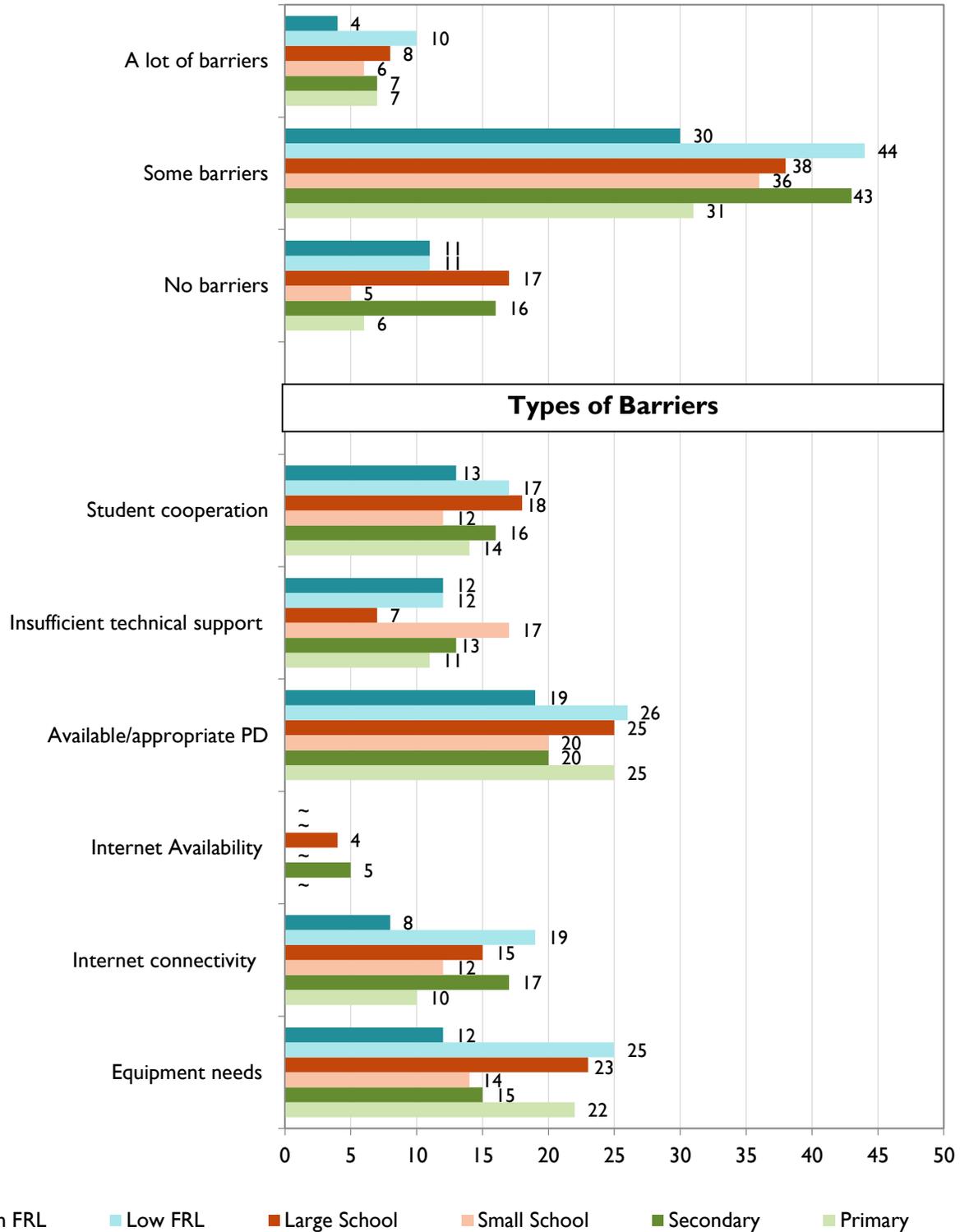
Note: Scale is (1) no interest in and no plans for implementing, (2) would like to be implemented but no plans in the next year, (3) plan to be implemented in the next year, or (4) already implemented

Figure C-3. Administrators' preferred or implemented learning management system



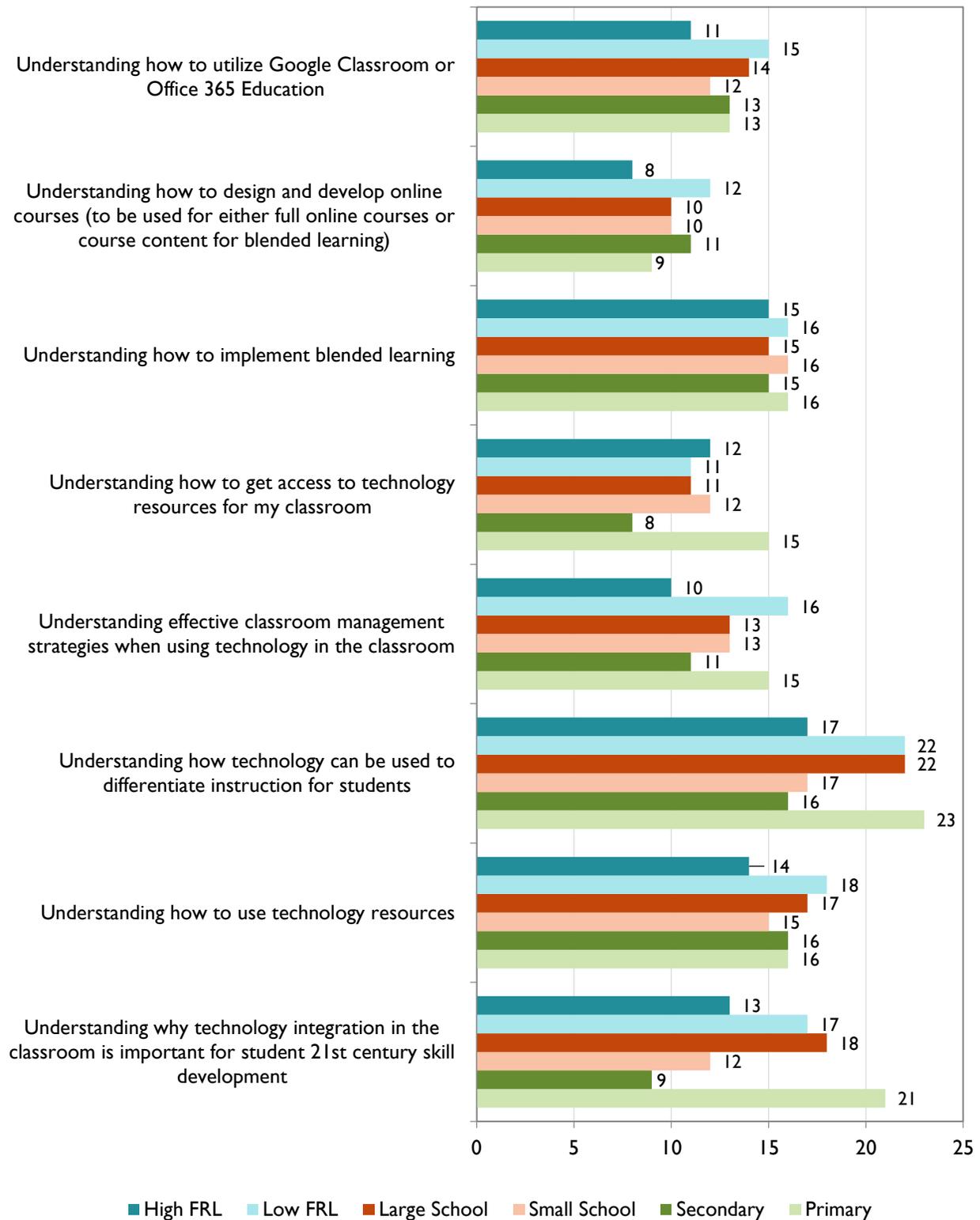
Note: “~” indicates cell suppression due to n < 4. The cell with the next smallest size was also suppressed to maintain confidentiality.

Figure C-4. Administrators' perceived barriers to digital learning

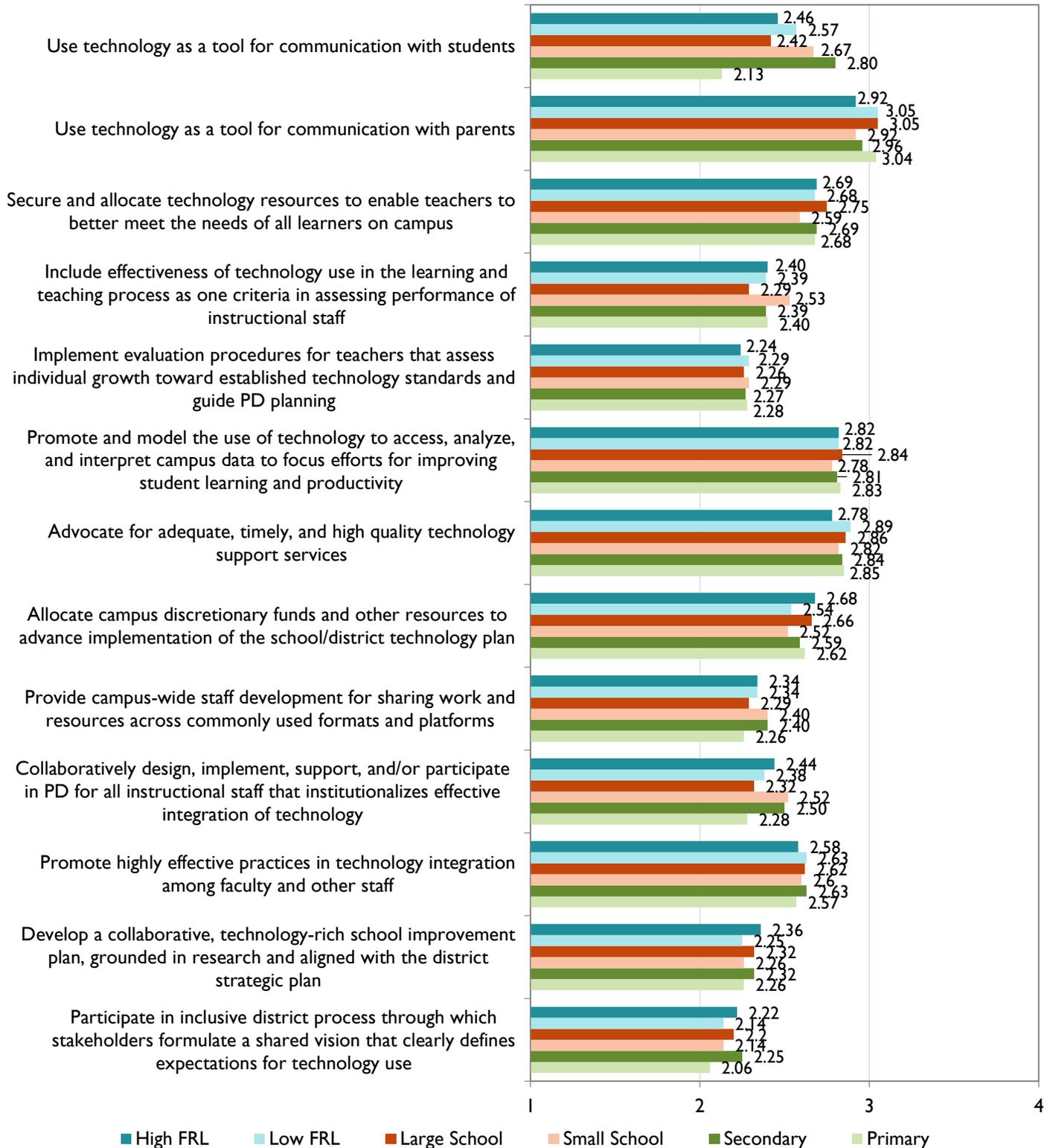


Note: “~” indicates cell suppression due to n < 4. The cell with the next smallest size was also suppressed to maintain confidentiality.

**Figure C-5. Administrator professional development needs**



**Figure C-6. Administrator means for use of technology**



Note: Scale is (1) not at all, (2) occasionally, (3) often, (4) to a great extent

## Teachers

**Table C-3. Teachers disaggregated by groups (school size, grade level and FRL)**

Group	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	78	14.9%	78	14.9%
2	45	8.6%	123	23.5%
3	181	34.7%	304	58.2%
4	61	11.7%	365	69.9%
5	25	4.8%	390	74.7%
6	42	8.0%	432	82.7%
7	56	10.7%	488	93.4%
8	34	6.5%	522	99.9%*

Group 1 = large school, high FRL, primary; Group 2 = large school, high FRL, secondary; Group 3 = large school, low FRL, secondary; Group 4 = large school, low FRL, primary; Group 5 = small school, low FRL, primary; Group 6 = small school, high FRL, primary; Group 7 = small school, low FRL, secondary; Group 8 = small school, high FRL, secondary

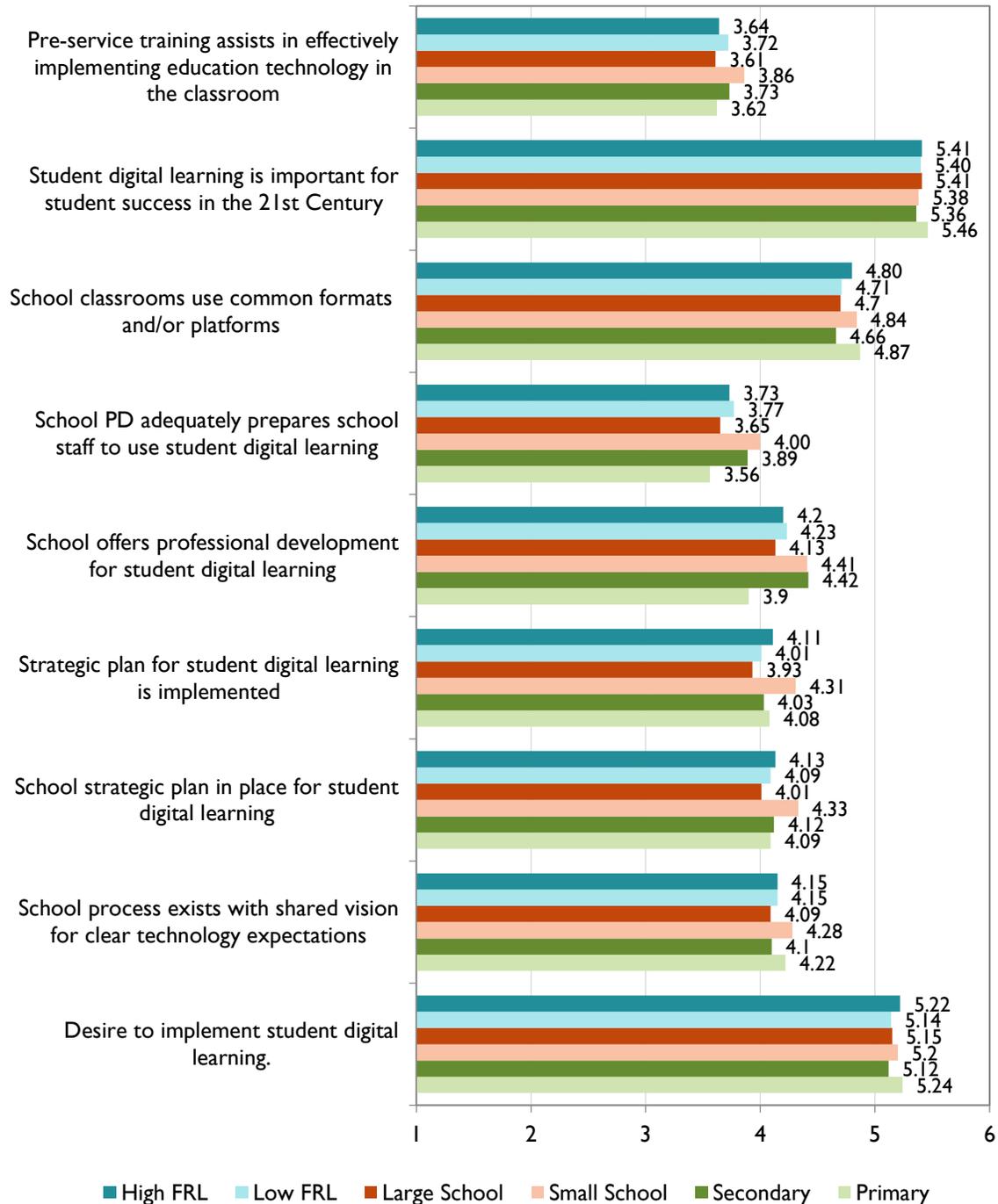
\*Sum of percentages does not equal 100 due to rounding.

Note: There are 18 missing cases.

**Table C-4. Teachers disaggregated by school size, grade level and FRL**

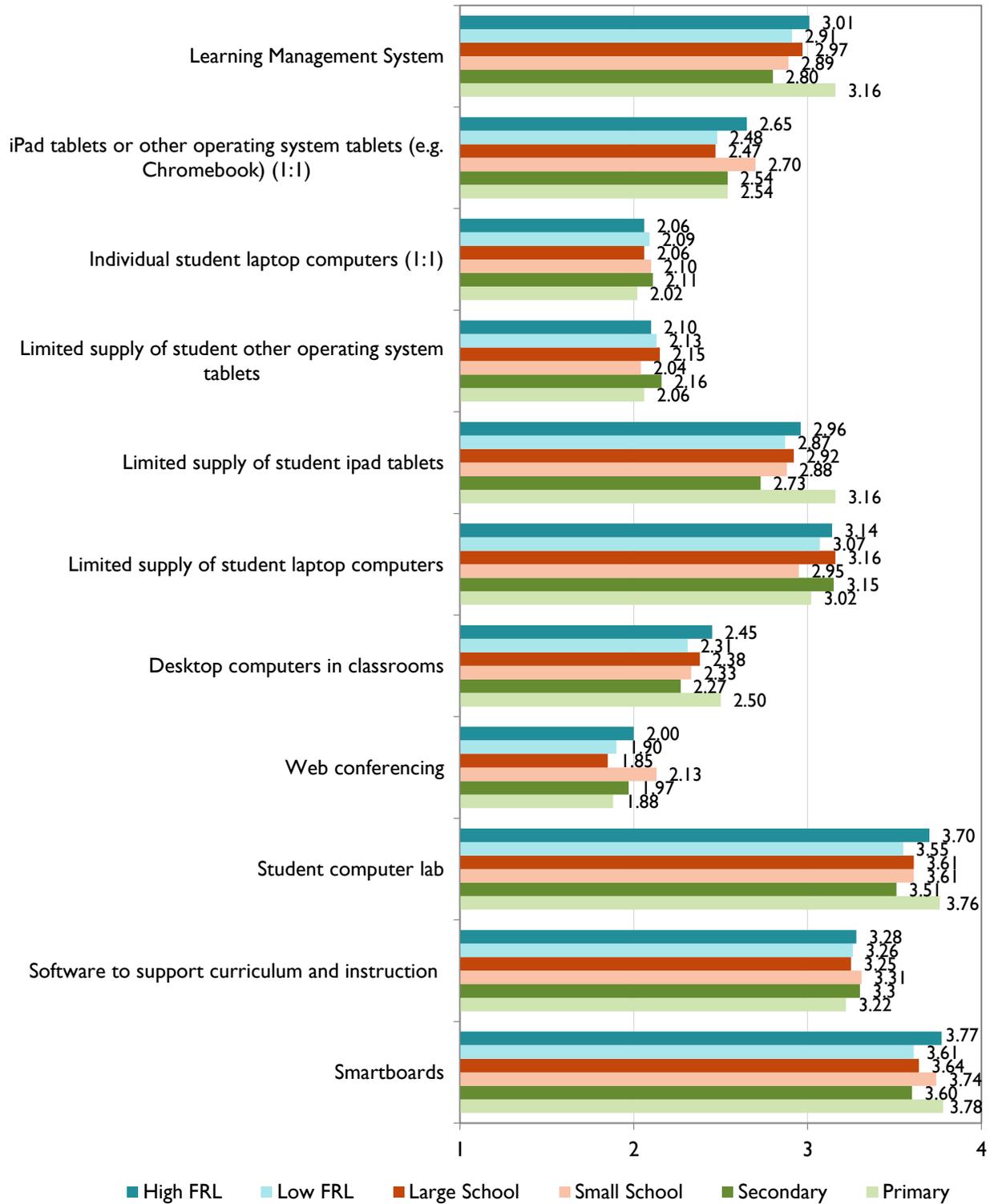
	Primary	Secondary	Small School	Large School	Low FRL	High FRL
Sample size (n)	206	316	157	365	323	199

**Figure C-7. Teacher means for digital learning strategic planning**



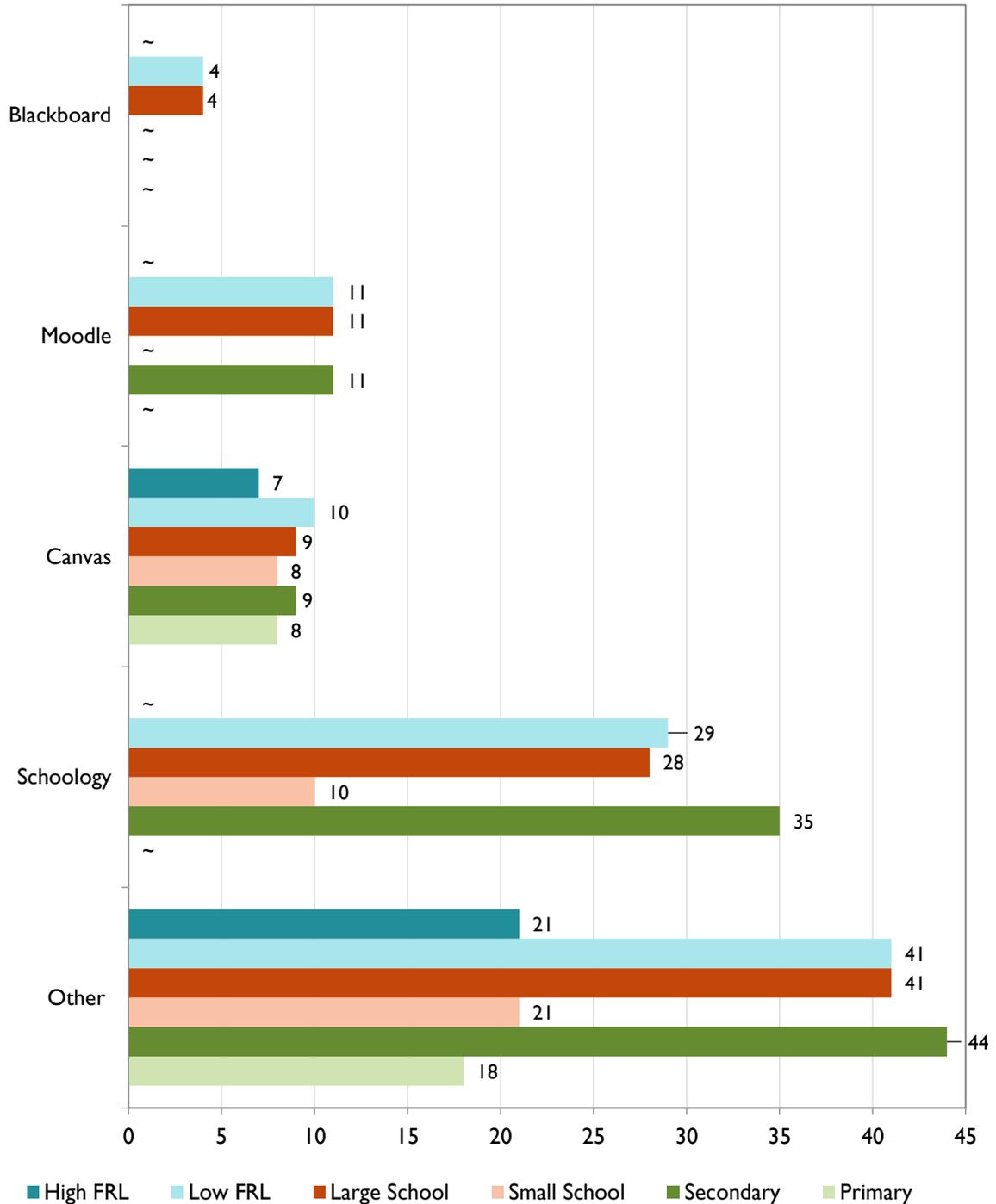
Note: Scale is (1) strongly disagree, (2) somewhat disagree, (3) disagree, (4) somewhat agree, (5) agree, (6) strongly agree

Figure C-8. Teacher means for digital learning implementation



Note: Scale is (1) no interest in and no plans for implementing, (2) would like to be implemented but no plans in the next year, (3) plan to be implemented in the next year, or (4) already implemented

Figure C-9. Teachers' preferred or implemented learning management system



Note: “~” indicates cell suppression due to n < 4. The cell with the next smallest size was also suppressed to maintain confidentiality.

Figure C-10. Teachers' perceived barriers to digital learning

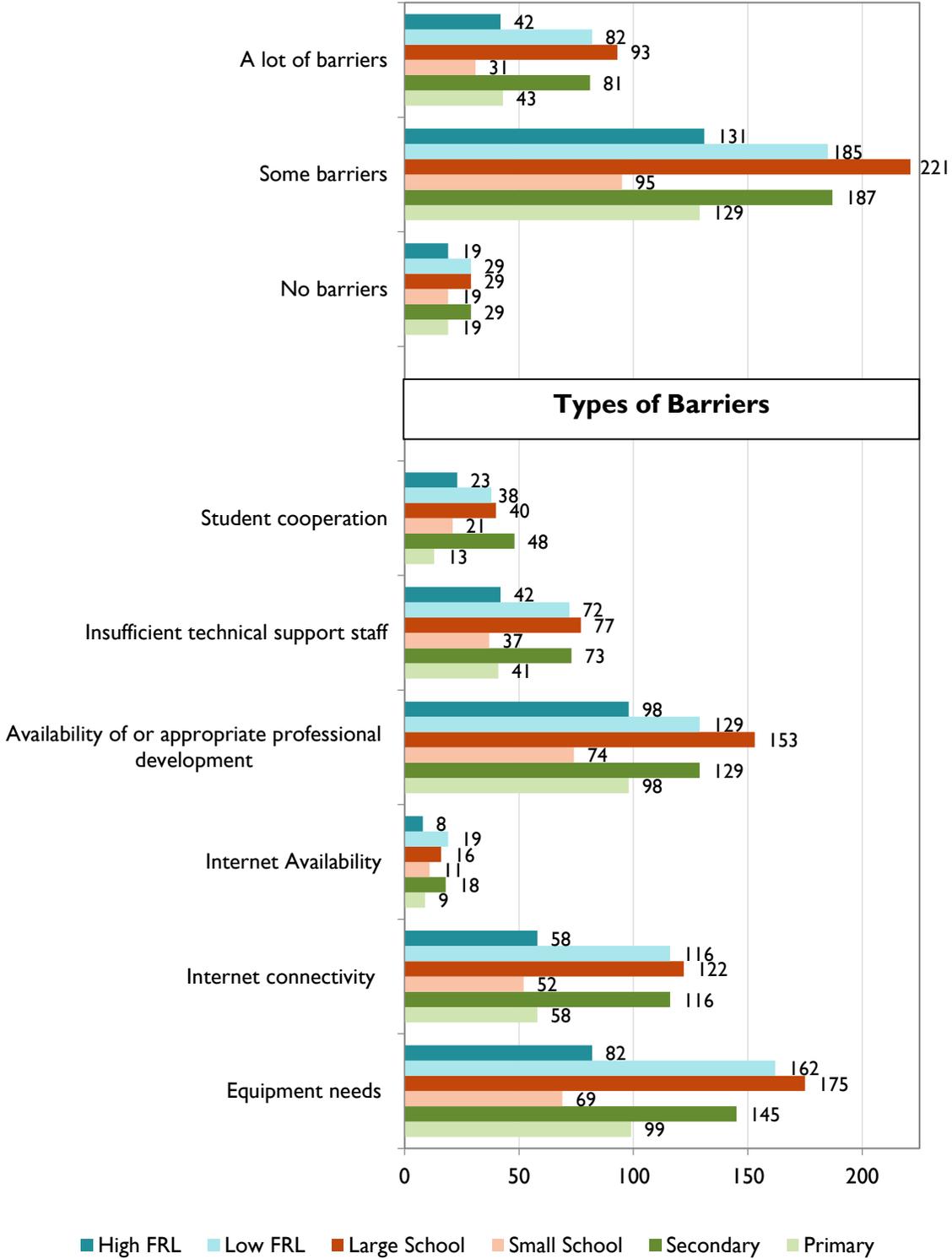
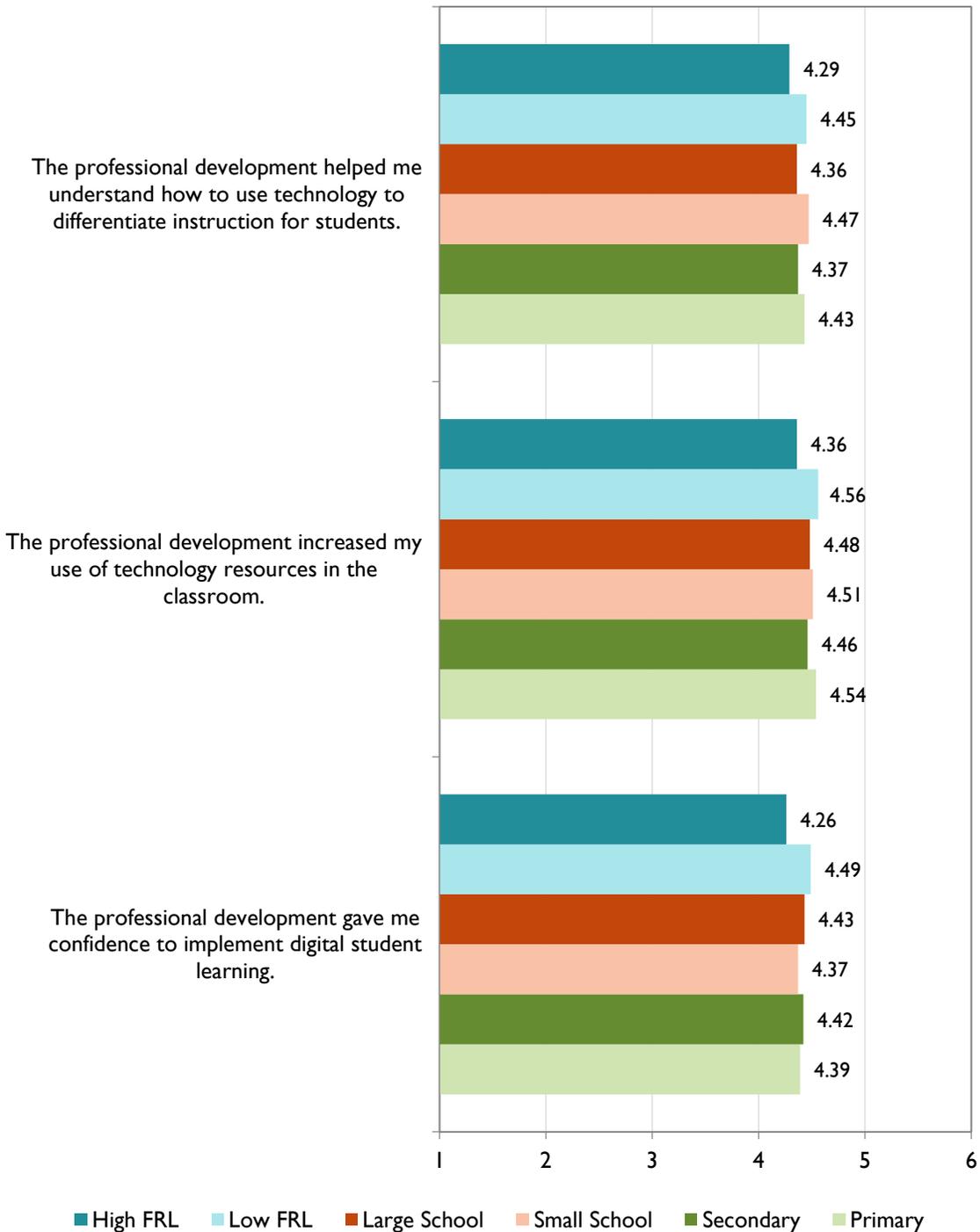
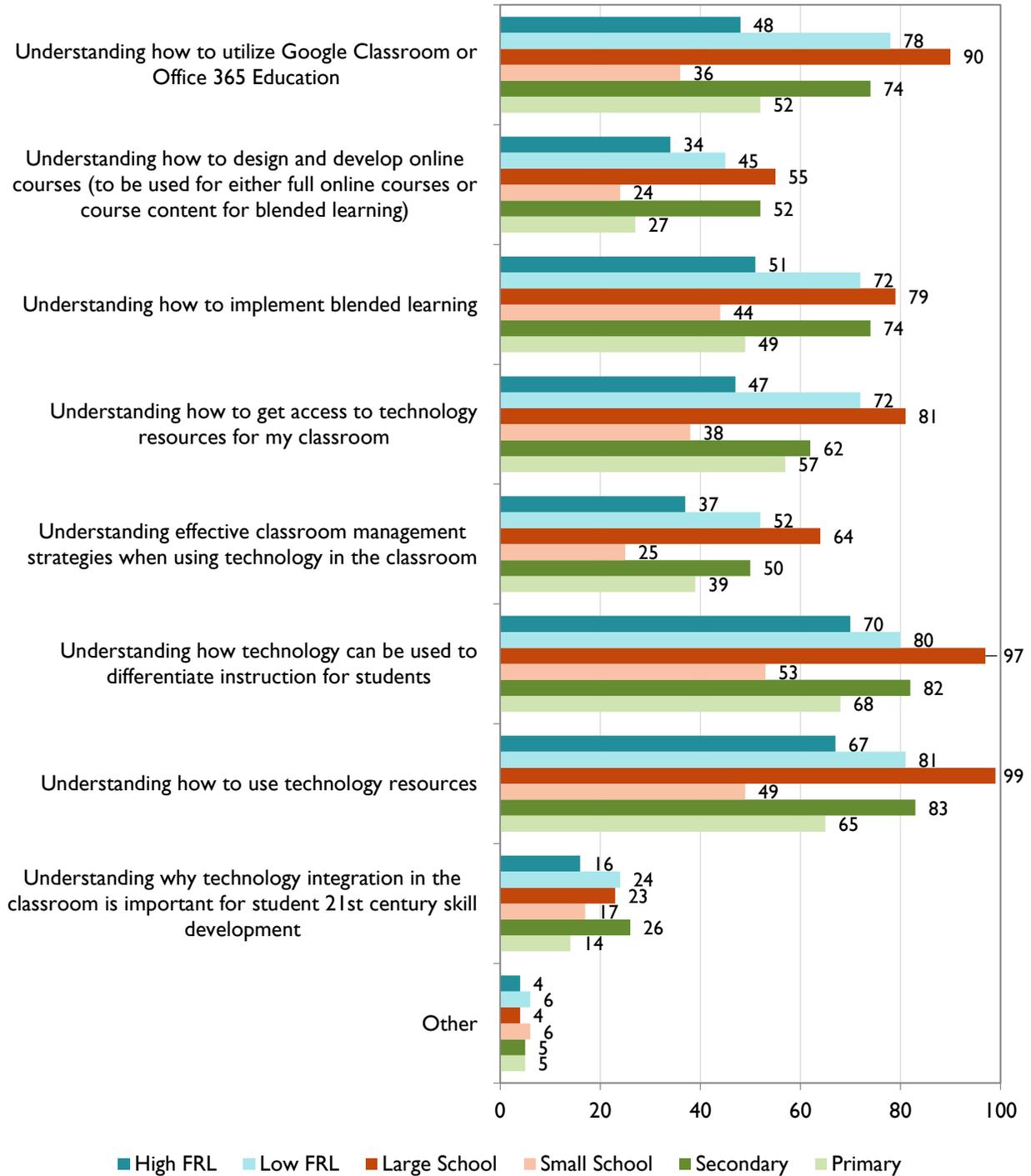


Figure C-11. Teacher means for perceptions of professional development



**Figure C-12. Teacher professional development needs**



**Figure C-13. Teacher means for use of technology**

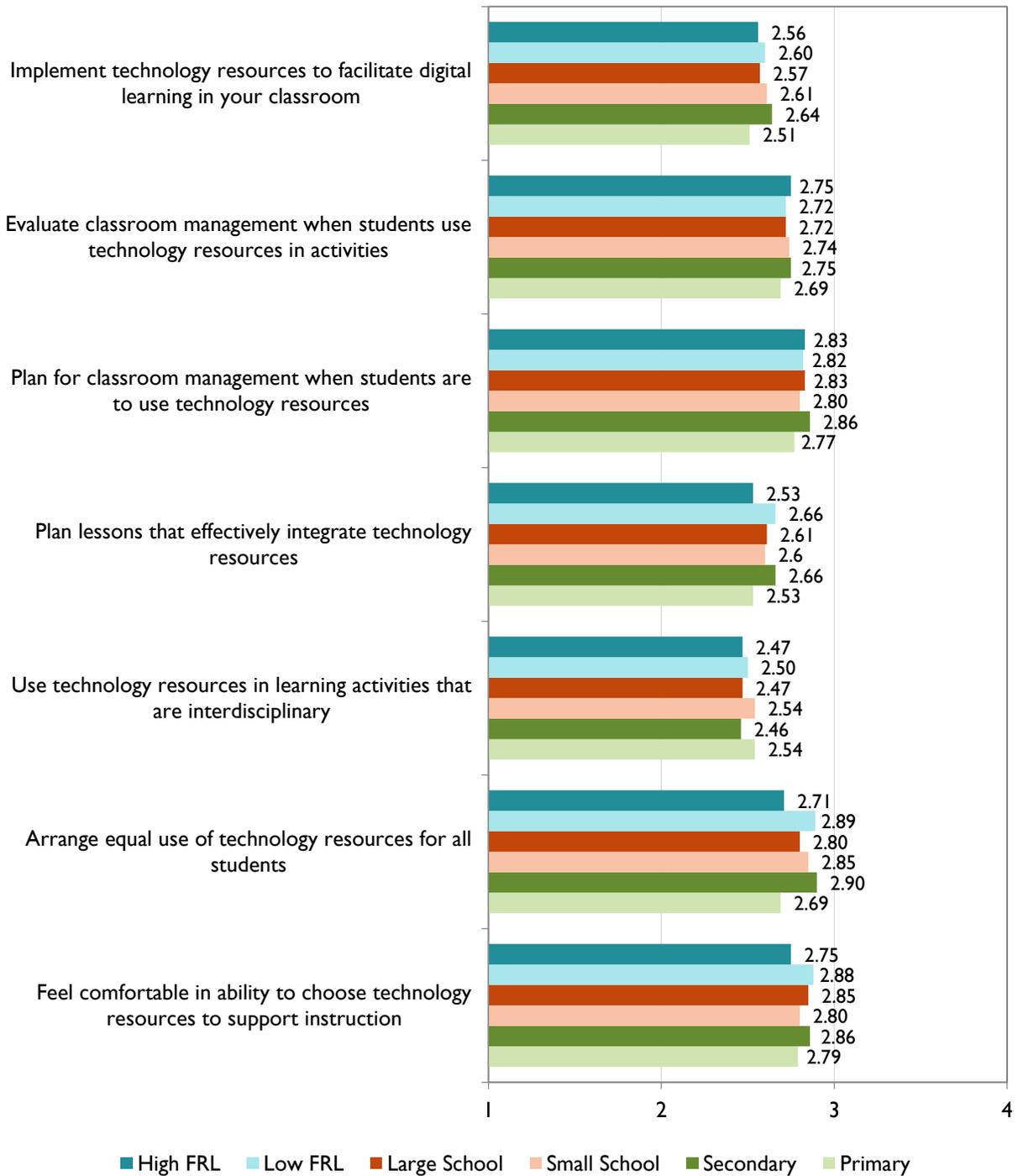


Figure C-14. Teacher interest in teaching online

