Office of Digital Teaching & Learning

2021 Opportunity Assessment Analysis and Conclusions

DIGITAL EQUITY FOR ALL STUDENTS TO ACHIEVE THEIR FULL POTENTIAL.

Arizona Department of Education

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I. ASSESSMENT OVERVIEW AND REPRESENTATION

128 Districts and Charter Systems from all AZ Counties participated in the 2021 Opportunity Assessment

The 2021 Office of Digital Teaching and Learning (ODTL) Opportunity Assessment concluded with participation from 128 Local Education Agencies (LEAs). The aim of the assessment is to determine areas of greatest need for LEAs in addressing the digital divide that limits K-12 students in Arizona from access to digital learning both at home and in the classroom.

The assessment covered 13 subject areas with an average of 9 questions per subject area (see Appendix Section 1). The subject areas served specific areas of interest within the digital learning space ranging from direct goods such as provision of computers, services, and information-based outcomes such as policy production.

Per our respondent LEA's, the areas that present the greatest need for students in relation to digital teaching and learning are: 1) increasing student connectivity, 2) teacher training, and 3) technology support. These areas were identified by using answers to rankings of need provided by LEAs, along with responses to open-ended questions.

Sample Representativeness

Given the large geographic size and diversity within the state of Arizona, we first looked at measures of geographic representation. Responses to the assessment represented all 15 counties within the state. Naturally, the number of responses were greater in population centers within the state as they have more LEAs; however, the response rate was consistent across counties.

The assessment instrument had two sections, the first addressing issues related to technology (access, support etc.) and the second on curriculum (availability of digital curriculum, skills development etc.). Overall, 79 LEAs completed both the technology and the curriculum portions of the assessment, giving a total sample size of 102 and 103 for the curriculum and technology portions respectively.

Table 1: Representation by County

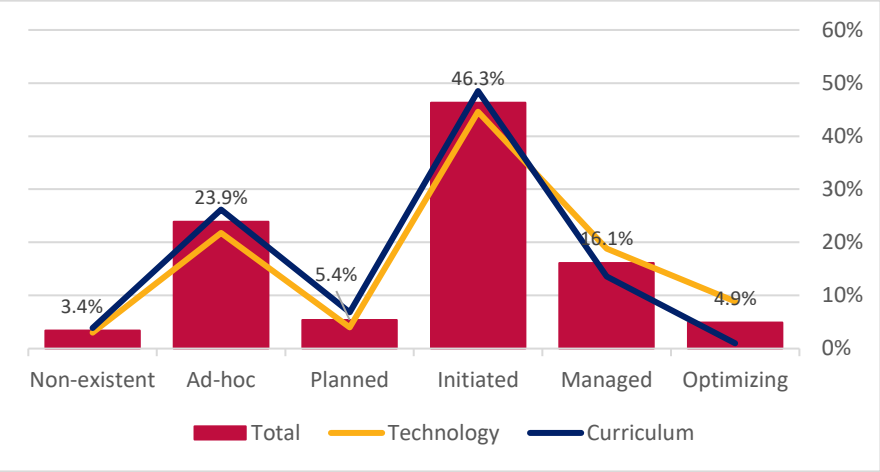
To learn more on sample representativeness, see Appendix section 1.

County	#LEAs	%Coverage
Apache	5	19.2%
Cochise	4	7.1%
Coconino	8	18.2%
Gila	3	11.5%
Graham	3	11.5%
Greenlee	1	10%
La Paz	1	6.3%
Maricopa	49	6.8%
Mohave	10	20.8%
Navajo	8	22.2%
Pima	8	4.8%
Pinal	9	12.2%
Santa Cruz	3	11.5%
Yavapai	9	10.0%
Yuma	7	19.4%

II. PRIORITIES TO ADVANCE DIGITAL TEACHING AND LEARNING

The lead question on the assessment requested that LEAs rate their generalized readiness in respect to digital learning practices. Complete answers provided in the appendix.

Figure 1: How LEAs self-assess their readiness for digital teaching and learning



A majority (67.3% having initiated, managed or optimizing) of LEAs are positively positioned for digital learning, with only 3.4% operating without any plan or operation for digital learning. It is also encouraging to see the number of LEAs that have shifted into the optimizing phase, with demonstrated success and engaging in continuous improvement comparable to conventional learning."

While LEAs shift out of the planned phase, there are significant numbers currently looking to move forward from the initiated phase. The integration of tracking measures is the pivotal transition in transitioning to the management phase and is essential to determining the efficacy of planned practices. In effect, without the transition to a tracking phase, LEAs will face difficulties in growing digital learning programs with improved outcomes.

Digital Roadmap

Optimizing: we have already demonstrated success and have reached some targets. Now we are in continuous improvement.
Managed: we track and measure our digital learning strategies over time and know the targets we aim to achieve.
Initiated: we have started to implement digital learning strategies and are working towards establishing our goals and targets.
Planned: plans for formal digital learning are in place, not yet executed or implemented.
Ad-hoc: improvised and rushed implementation of digital learning with no plan in place.
Non-existent: no interventions for digital learning.

In comparing the responses of curriculum against technology representatives, there is broad alignment. The most apparent point of departure is the higher percentage of technology representatives listing their district at an optimizing state.

Overview of LEA Priorities

We requested LEAs to rate their priorities on next steps, opportunities, or needs. This question was asked separately of curriculum and technology representatives, given their distinct and separate areas of expertise.

Enhancing Digital Skills for Teachers and Staff is a clear Top Priority for Local Education Agencies

Among LEA representatives in charge of curriculum, enhancing digital skills was ranked highest on average. At the same time, it must be noted that one-third of all responding LEAs noted that they had no or little training available for instructional staff on digital teaching and learning practices.

The next two items, dealing directly with digital content and delivery, are tightly, and appropriately, connected. The dovetailing of digital solutions to directly operate with students is the next priority for LEAs – building on providing the instructor support listed in the previous priority.

Lowest among the priorities were elevating support for remote learners, and remotely assessing student work. This low ranking may be due to the current immediacy for meting other needs. It may also be attributable to LEAs indicating that only about 7 percent of their students were considered remote or hybrid at the time of the assessment (A boxplot showing the distribution is provided in the Appendix Figure 1).

Support Systems, Policies and Procedures, Connectivity and Digital Devices all are Priority Items for Technology Representatives

The ranking by technology representatives yielded a far less clear picture in terms of overall needs (with on .7 points of separation across all the topics). To parse the comingled picture, we looked at which areas were commonly ranked in the top three positions across LEAs. By this metric, technology support (including staff support and resolution of technology issues) was ranked highest - in the top 3 priorities in 60 percent of all responses. At second place was the need for policies and procedures, including both the creation of policies and training. Rounding out the top three was connectivity, both to schools themselves and to students at home, garnering a top three ranking for 53 percent of respondent LEAs. Both urban and charter groups listed the implementation and improvement of LMS (Learning Management System) systems as their lowest priority.

To address this relative lack of clarity, we turn to the responses from open ended questions, which may provide more nuance and context.

Responses to Open Ended Questions

Within these broad open-ended questions, we asked LEAs their priorities for the next year (if budgets were not a constraint) and whether there were issues important to them that were not addressed within the rest of the assessment.

LEAs Need Support to Make Digital Teaching and Learning a Priority

"We are dealing with [challenges in students'] behavior and learning loss. After we get this under control, we will focus more on technology integration."

The overall picture from open–ended responses from curriculum representatives reaffirmed the conclusions from the more quantitative part of the survey. In order of importance, 33 percent of the LEA's spoke to the need for training capacity; followed by staffing needs at 26 percent (specifically the need for additional staff to reduce increased loads on current instructional staff, technology directors and educational technology coordinators). Following closely (at 22 percent) was an expressed need for materials related to digital learning and curriculum.

LEAs Would Like to Learn Best Practices from Each Other

It would "be beneficial just to know how other districts manage [their devices and digital learning]."

In terms of a challenge that had not be addressed in the quantitative portion of the study was the struggle that LEAs face with shifting in-person dynamics, particularly given the number of students transitioning into and out of the remote environment which reinforced the need for ways to alleviate difficulties in daily transitions from in person to at home schooling. One respondent noted that it would "be beneficial just to know how other districts manage [their devices and overall digital learning]."

At the same time, not all districts are ready to commit to broader digital teaching and learning practices, due to other challenges that need more immediate attention. One LEA noted that they "were hesitant to add [another thing] to teacher's plate at this time"- a nod to both well understood time constraints but also to reticence on the immediate needs for digital learning in the LEA. This comment was reinforced by another LEA noting that "We are dealing with [challenges in students'] behavior and learning loss. After we get this under control, we will focus more on technology integration."

30% of technology representatives agree that, if budget was not a constraint, their priority would be to increase their technical support staff.

The responses from the technology representatives – while more situationally nuanced in some cases- echo the responses of the curriculum representative. Unsurprisingly, technology representatives noted staff as an underlying need in 30 percent of assessments, greater than any other topic rate – with 5 percent noting the specific desire for a technology coach to train teachers on digital practices. The technology representatives voiced a need for updating infrastructure, with

20 percent of the respondents speaking to the need for supplying refreshed servers, wi-fi structure for classrooms, and broadband capacity.

Technology representatives reiterated known concerns in serving a geographically diverse state like Arizona—specifically, almost 30 percent noted concerns with connectivity in that large areas within their district were underserved. The open-ended questions also provided insights into situations that are geographically or community specific, such as the need for "providing Wi-Fi on buses," and a preference for a "microwave internet ...implemented in Utah [that] works very well in rural and rugged terrain."

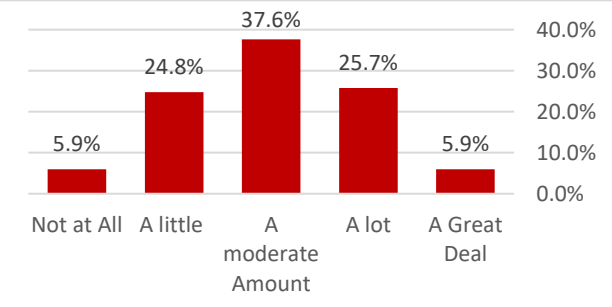
The open-ended questions also allowed respondents to voice clear concerns that are often overlooked. For instance, one respondent noted that the actual cost of running a one-to-one program was often more than purchasing devices, since it overlooked the costs of carts, cases, and additional staff to support the devices. As they said, "assuming a one-to-one program equals just enough money to purchase one device per enrolled student is a completely false assumption."

III. DIGITAL SKILLS

Digital Skills for Instructional Staff

As noted previously, curriculum representatives from LEAs have labeled instructor training as the most pressing component in delivering digital content to students in the state. Almost one-third (31 percent) of all LEAs indicated that they had little or no training for instructional staff to enable them for digital teaching. This lack of training, however, is not endemic to all LEAs, with 37 percent indicating that they had a moderate amount of training available and another 32 percent indicating that they had a lot or a great deal of training on digital teaching and learning. Further discussions with the LEAs and their responses to the open-ended questions that it is often not the availability of training that is as issue; but rather it is the quality of the training, as well as the time and financial resources required for applicable training on digital teaching.

Figure 2: How much training on digital learning LEAs have available for instructional staff.



In the context of instructional staff proficiency, one-quarter (26 percent) of LEAs responded that their instructors have low or no proficiency in delivering digital content for students. While the majority of LEAs noted a moderate proficiency, only 6 percent indicated that they felt their instructional staff had a high level of proficiency. Put

simply, there are clear shortfalls in relation to the training of instructional staff in Arizona on digital teaching and learning practices.

Approximately half of the respondents reported that their instructional staff are not at all familiar with ADE standards related to digital teaching and learning (specifically Arizona Department of Education's Educational Technology Standards and Computer Science Standards). In addition, 30 percent of LEAs indicated that they would be very interested, and another 62 percent somewhat interested in training for instructional staff on those same standards, indicating an important opportunity for needs fulfillment in this area.

Table 2: LEAs familiarity with technology standards

	Comp. Science Standards	Education Tech Standards
Very familiar	3.88%	2.91%
Somewhat familiar	42.72%	54.37%
Not at all familiar	53.40%	42.72%

A critical piece to producing effective outcomes from the use of digital learning materials and practices is evaluating and providing feedback to instructional staff, in particular how the feedback standards compared across digital learning versus traditional learning experiences. Over 70 percent of responding LEAs have some form of feedback or evaluation for instructional staff related to digital materials use though only 4 percent indicated their feedback and evaluation practices are consistent with in person learning.

Digital Skills for Students

To identify student support needs for digital learning, the survey looked at both the broad preparedness for all students, as well as the ability of LEAs to provide specialized supports for students with special needs. This includes Arizona Department of Education's commitment to preparing digitally ready learners broadly, even while focusing on the needs of special populations. Thus the survey also focuses on how LEAs are enabling the use of specialized materials and software to help these same students in achieving success.

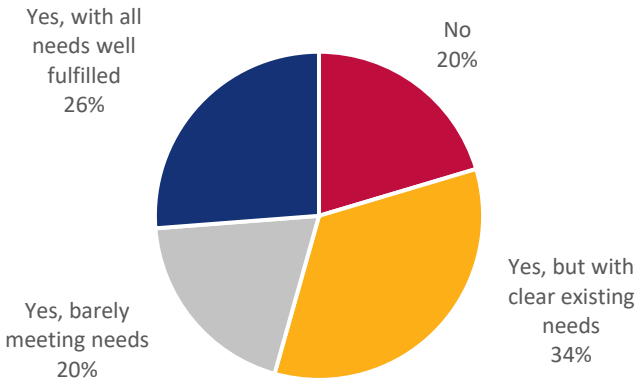
Perhaps one of the best indicators in our assessment was the number of respondents was the availability of student training on basic digital practices. In contrast to the previously noted lack of instructor training on digital teaching and learning practices; student training was widely distributed within LEAs. Only one out of every eight LEAs lacked training on laptops or the responsible use of the internet. Further, two-thirds of LEAs indicate that they provided training on LEA

Figure 3: Availability of student training by type of training

IT policies and procedures and training on digital citizenship. While there is a drop off regarding training on assistive technology, it appears that these are primarily smaller LEAs which may not perceive needs for assistive technology training. That perception may be upheld because our data shows some of these LEAs have limited or no students in specialized learning situations. While the overall results are positive, there are still gains to be made among those LEAs without trainings in any of the above areas.

In contrast to the positive results for student training overall, the LEAs within our respondent pool indicated that students with special education needs could be more strongly supported. Fully one third of our pool noted that they are providing assistive technology to students, but still have needs that are not being met. Additionally, 20 percent marked those needs were barely being met. Again, there is considerable overlap between those LEAs denoting no assistive technology support in their LEA and those smaller districts noted earlier.

Figure 4: Does your LEA provide digital support to students with special needs?

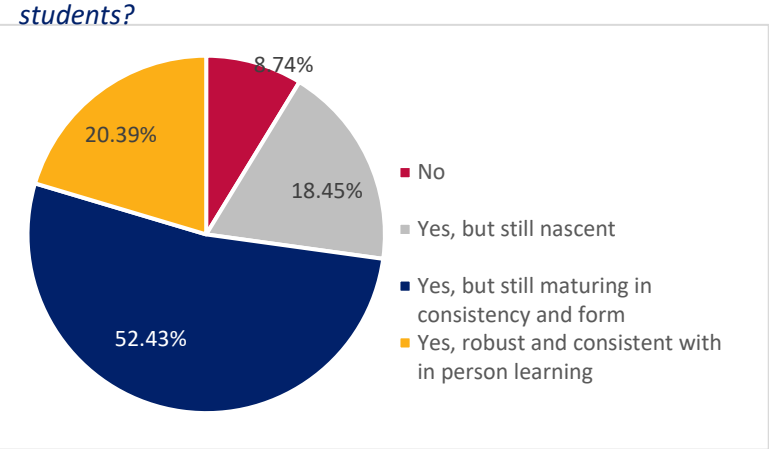


Additionally, Arizona has a significant number of English language learner students who require specialized tools to ensure that they are not being disadvantaged in contrast to native English speakers. Our respondents indicated that they had a variety of tools to aid English language learners in attaining educational goals. Covering a broad range of materials, over 60 percent of our LEAs made use of audio-visual resources, short video material, and peer support for English language learners. Perhaps owing to the repeated concerns about not having enough instructional staff, there was a substantial drop-off on the use of coaches.

Student Assessments

Remote assessment of student learning presents a unique set of challenges across all learning platforms and Arizona's LEAs are not unique in that regard. Measures for remote assessment are often not available to the same extent as they are for monitored in-person classrooms. It is clear, however, that the move to digital learning requires putting into place different practices to address this gap.

Figure 5: Does your LEA have the ability to remotely assess students?



The wide majority of LEAs (almost 80 percent) in our respondent pool do not currently have practices for remote assessment consistent with practices they employ for assessing in person assessment. Over 20 percent of LEAs report that they have practices for remote assessment that are robust and consistent with in person assessment. Those practices should be investigated in depth to provide an understanding of the practices developed in those locations.

Consistent with the above, only 27 percent of LEAs report that they have an implemented policy related to assessments in a remote learning environment. Unsurprisingly, there is significant correlation between the self-assessed robustness of assessments and having a LEA-wide policy in place for remote assessments. On the other hand, over 60 percent of LEAs with a "Robust assessment system" consistent with in person assessments are still without an assessment policy in place (crosstab in Appendix Table 11).

IV. CONNECTIVITY

Broadband

The need for increased broadband capacity was widely discussed in open comments referring to needs, both at the LEA-level and at the student level. The diverse nature of Arizona leads to a range of challenges to connectivity: such as limited broadband infrastructure in rural areas as well as individual and community-level income constraints to pay for broadband internet.

Without the capacity for broadband, the aims of increasing student learning outcomes in Arizona through the use of digital technologies becomes increasingly difficult. Home broadband connectivity is a concern for several dovetailing reasons. For instance, the "homework gap" is recognized to be associated with lack of access to broadband connectivity, preventing students from taking advantage of the benefits of digital learning practices at home. Establishing broadband connectivity has additional value in that it increases household capacity for economic benefit, helping not only student-learning, but also family economic outcomes. Education Superhighways estimates that 23 percent of students in Arizona lack broadband at home. More

23% of K12 students in Arizona lack broadband at home.

Source: Education Superhighways

specifically from our survey indicated that over 72,000 students lack a broadband (non-hotspot) connection to access digital learning ((based on the 90 LEAs who responded to the question).

Additionally complicating the picture, only 36 percent of our respondent pool indicated that they are collecting student connectivity data on an ongoing basis, potentially leaving LEAs without knowledge of ongoing struggles with student connectivity. Further, a geographic divide – even in just collecting connectivity data – exacerbates the situation. Whereas population center counties such as Maricopa and Pima make up the predominant number of counties collecting data on an ongoing basis, the lower population density counties only have 31 percent of their LEAs doing so. (Appendix Table 4). Within those LEAs that are not collecting connectivity data, the average estimate for unconnected students was 38 percent of all their students, with several LEAs noting that they believed that almost 75 percent of students were not connected.

Some LEAs estimate that almost 75% of their students lack connectivity at home.

Hotspots

While the standard for achieving the best possible broadband connection is through a physical line to the students' home, hot spots serve as an important steppingstone, often providing an internet connection where timely supply of a fiber or cable line is not feasible. As a result, many LEAs use hot spots as an intermediary towards achieving increased connection parity. Within our respondents, 70 percent provide hot spots either for students or instructional staff. However, 13 percent of respondent LEAs answered that they were unable to provide hot spots for students and staff at the level that meets their needs.

To provide hotpots for students and instructors LEAs employ a wide variety of funding mechanisms. The top three funding mechanisms were CARES Act, ECF (Emergency Connectivity Funds) and internal LEA funds.

Measures that LEAs have taken thus far are often ad hoc and less than desirable, such as several LEAs directed students to LEA parking lots, community centers, and other locations for to access the internet. To shift beyond ad hoc measures almost 75 percent of LEAs described a need for sustained long-term funding (rather than temporary funding) to help with connectivity. Second, LEAs noted connectivity concerns within the district at a rate of almost 20 percent, that LEAs even with hotspots, are unable to provide reliable internet to students because of lack of coverage in specific areas.

Table 3: Connectivity Funding Mechanisms

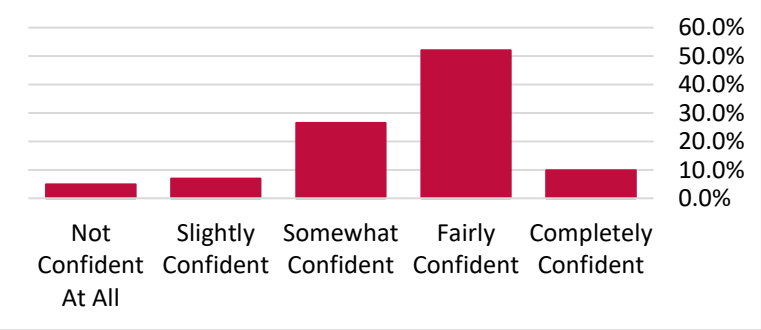
General Funds	37.7%
ECF	36.2%
CAREs Act	36.2%
ESSER	24.6%
Grant Funding	10.1%
T-Mobile Project 10 Million	7.2%

Numbers do not add to 100% as LEAs may have more than one funding source for hotspots.

V. DATA AND SECURITY

Preparation for cybersecurity emerged as being a key area of opportunity. Most LEAs indicate that they are confident of their cybersecurity measures. However, self-evaluation of cybersecurity threats and readiness consistently understates many of the concerns that cybersecurity experts portray. It should be noted that we broke out responses on cybersecurity sentiment by rural/urban divides, county, and between charter systems and school districts – with most breakouts remaining remarkably similar.

Figure 6: Respondents rate the level of confidence in their cybersecurity



On the positive side of things, 26 percent of LEAs had conducted a professional risk assessment within the past year – a number that rises to 45 percent when self-assessments are included. This considerable number indicates that LEAs are being made aware of potential cybersecurity shortcomings. The confidence relayed by these statistics, however, is undermined somewhat at the other end of the scale, which indicates that 41 percent have not risk assessed or are unsure of their last risk assessment.

Although overall self-evaluation portrays confidence and readiness, further review lends itself to disconcerting conclusions. While we expected those LEAs ranking themselves highly on the overall roadmap to have robust cybersecurity measures that is far from universally the case.

Relating overall cybersecurity confidence to risk assessments, we found that 38 percent of LEAs that are fairly or completely confident in their cybersecurity had not completed a professional risk assessment. Similarly, within that same confidence grouping, 28 percent of responding LEAs noted that they have never risk assessed or were unsure when their last assessment was. The situation described by these breakouts intones that a portion of the LEAs in our assessment, while confident in their situation, may be unaware of their cybersecurity risks. Further, we found that the roadmap is negatively correlated both with the time since their last risk assessment and their confidence in cybersecurity specifically.

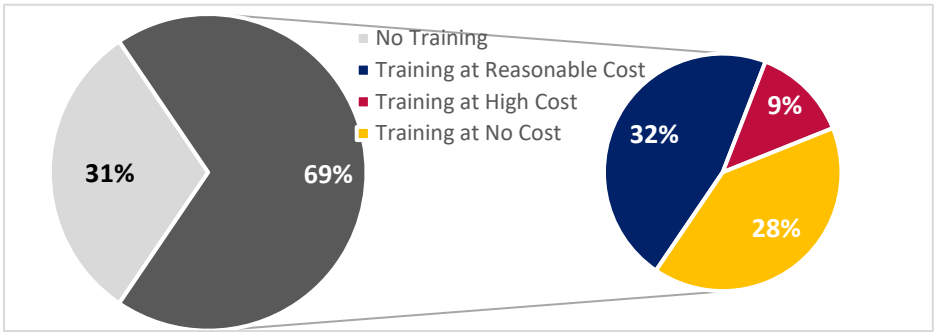
Assessments indicated that most LEAs are operating with measures intended to provide for compliance with the Children's Internet Protection Act (CIPA). CIPA compliance is potentially integral to making student internet connections safe and secure. Almost three quarters of LEAs (74 percent) have measures to reinforce compliance with CIPA, make use of filtering while at home and on campus, and coordinate use allow/deny lists for any student

devices. There are, however, significant opportunities surrounding the remaining 26 percent of LEAs that are not currently employing all these practices.

Cybersecurity Awareness Training

Owing to the need for cybersecurity training, LEAs were asked about the availability of cybersecurity trainings for instructional staff. Two-thirds (69 percent) of LEAs indicated that they currently provide cybersecurity training for their instructional staff, leaving 31 percent without any cybersecurity training for instructional staff. From the group that does provide training, one quarter (28 percent) of LEAs indicated that they were able to conduct cybersecurity training at no cost to the LEA. However, on the other hand 9 percent of indicated that the cost of cybersecurity training is too high, indicating that solutions are needed for those LEAs as well the ones without any training.

Figure 7: Access to Cybersecurity Awareness Training

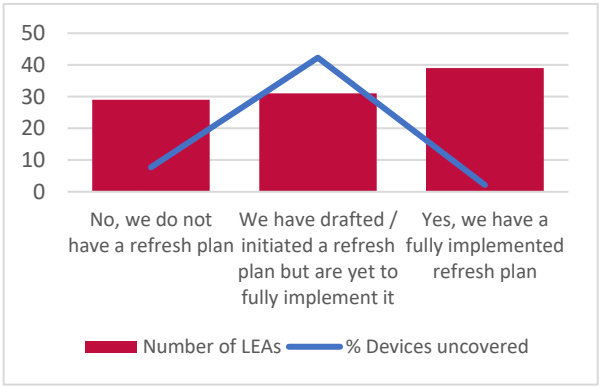


VI. DEVICES

Instructional Staff Devices:

Over two-thirds (39 percent) of LEAs in our assessment noted that they have a fully implemented refresh plan for instructor devices. Another third (31 percent) have drafted refresh plans for instructor devices though these have not been fully implemented. An important red flag for potential roadblocks down the road -LEAs with refresh plans that are drafted, but not fully implemented, is the fact that 42 percent of their instructional staff devices are no longer supported by the manufacturer. It may be assumed that plan implementation is possibly restricted by the ability to pay for devices within a refresh schedule.[1] It is also important to note that 29 percent of LEAs are without even a drafted plan.

Figure 8: Refresh Plans on Instructional Staff Devices



[1] The low percentage of devices off coverage is a suspected result of a lack of knowledge surrounding manufacturer support.

Of the devices allotted for instructor use within our respondents, Windows laptops were by far the most predominant category, making up 45 percent of all instructor devices. Second was the use of Chromebooks, which made up 28 percent of all devices. iPads and other Apple products made up 26 percent of the devices, evenly split between the two types.

Student Devices

Refresh plans for student devices carry a similar outlook with 38 percent having a fully implemented plan, 33 percent have a drafted, but unimplemented plan, and 29 percent of LEAs lacking any refresh plan for student devices. Among those LEAs with some type of refresh plan (whether implemented or not), half (49 percent) have designated five years as the time for replacement. Fortunately, this would place most student devices under continued manufacturer support in these LEAs. However, manufacturer support may be lacking where the refresh plan is longer or non-existent.

62% of LEAs do not have a fully implemented refresh plan for student devices.

Chromebooks made up most student allotted devices, making up 68 percent of all the devices in our respondent pool. At a distant second place Windows laptops made up 17 percent of student devices. Although there were other devices carrying 2 percent of the total amount, iPads made up the last of any significant quantities with 12 percent of the total.

Turning to allocation of student devices, our assessment indicates that every single LEA purchased at least some digital devices for student use. Further, 66 percent of respondents indicated that they have a one-to-one program for the grade levels that they serve. We should add that this is possibly an instance where small sample size within grade level may inhibit the accuracy of our data.

66% of responding LEAs have a one-to-one program for student digital devices.

Looking to the future of one-to-one programs, only 72 percent of LEAs had sufficient devices to allot on a one-to-one basis, at the same time, while only 68 percent of LEAs believe they would be able to have sufficient devices in the future. The drop from several LEAs being able to provide devices on a one-to-one basis is troubling.

To maintain operability of those student devices, thirty percent of LEAs offered extended warranties. The same number LEAs offer accidental damage protection in the case that a device is damaged after allocation. Additionally, 14 percent benefited from white glove services, such as asset tagging or enrollment. Owing to the difficulties surrounding such a program, only 11 percent provided any protection for lost or stolen devices.

14% of responding LEAs make use of the benefits from white glove services for technology devices.

VII. POLICIES AND PROCEDURES

Appropriate procedures and policies surrounding the use of digital teaching and learning are integral to providing consistent and effective material for Arizona's students. With the implementation of board-approved policies including an action plan, the LEA can more effectively judge the next steps in digital strategies and inform technical and instructional staff with accepted and effective practices.

At the positive end, 44 percent of LEAs within our pool have fully adopted and implemented policies at the board-level. Yet another 23 percent have adopted and partially implemented policies at the board-level and recognizing they still have some effort needed to fully codify plans.

Table 4: Percentage of LEAs by level of adoption of policies and procedures

Our district has adopted and completely implemented board-approved policies for digital learning	44.1%
Our district has adopted and partially implemented board-approved policies for digital learning	22.5%
Our district has adopted board-approved policies for digital learning but has not developed an action plan	8.8%
Our district has drafted board policies, but we have not received approval yet	4.9%
Our district has not started the work on drafting or documenting policies for digital learning	19.6%

In contrast, almost 20 percent of LEAs are starting effectively at ground-zero. While these LEAs are at the entry point for creating digital learning policies, they also have the most opportunity to learn best practices from LEAs with fully implemented plans.

Of those LEAs with technology policies currently implemented, 65 percent indicated that they had student technology acceptable use policies. Of those policies provided, only student laptop loan agreements and FERPA compliance policies were above 50 percent of implementation. While these rates are good signs, it is concerning that there are still a high number of LEAs without these policies in place. Rounding out the lower end of the scale, auditing policies and security controls review policies were only in place in roughly one-fifth of LEAs, especially discouraging as these policies enforce up to date practices for cybersecurity.

Over **33%** of LEAs have not yet implemented board-approved policies around digital teaching and learning.

VIII. CLASSROOM SOLUTIONS

Digital Content

While technological capacity and instructor expertise provide the backbone for digital learning practices, the availability of quality digital content is critical to providing effective and value added learning for students. Over 80 percent of our respondent group indicated that they provide digital content either for classroom use or available for use at home. (Digital Content Breakouts by Grade Level in Appendix Table 3)

Over **80%** of LEAs provide digital content either for classroom use or home use.

Within our respondent LEAs that provide digital content to students for use both in the classroom and at home, 17 percent are providing that content without any board approved policies in place. The key concern with LEAs is whether content being provided to students is in alignment with standards. Without direction or clear policies, instructors without policies relating to digital content may be out of alignment with other instructors or collaborative efforts within an LEA.

17% of LEAs that do use digital content do so without digital specific board approved policies for selecting content.

One-third of respondents have indicated that they are employing extended reality in their classrooms. The LEAs integrating extended reality into the classroom shows the extent to which some LEAs are pushing the current bounds of digital materials for the benefit of students.

Technology in the Classroom

The benefits of digital learning go well beyond pandemic readiness. Thoughtful digital teaching practices have the potential to increase teaching effectiveness by capitalizing on technology's ability to cater to different learning styles and expose students to new perspectives on curriculum. If LEAs want to capitalize on the benefits of digital teaching and learning the practices extend well past those temporarily imposed during the pandemic.

A wealth of educational digital tools are now being produced for classroom use, yet only 32 percent of the LEAs responding to our assessment indicated that they were using the tools that we asked about. Traditional document cams and projectors made up the largest portions of use with 26 and 23 percent of LEA, respectively. Interactive flat panel screens were only used in 12 percent of LEAs that responded.

Conclusions from this portion of the assessment are two-fold. First, many of the digital teaching aids are not as used as well as we would expect. Potential roadblocks could be ever-present funding constraints, since many of these devices can be expensive when used across multiple classrooms. Moreover, the additional expense of

training instructional staff on these devices is another consistent concern for LEAs. We expect to further investigate this lack of use of digital technologies in classroom contexts.

IX. LEARNING MANAGEMENT SYSTEMS

Learning Management Systems (LMS) provide instructional staff with an online tool with a wide array of functions such as delivering online resources, assessing student performance, and more. Per student costs range from approximately $0 per student (freeware LMS) to $190 per student to with an average of $41 per student for those LEAs that budgeted for service. The wide range of per-student costs may be attributable to both the wide range of LMS definitions, but also the wide variety of purchasing options available. While the most common option for LMS is as a software-as-a-service, other options such as license purchase and setup may exaggerate budgeted price during the first year of service (see Appendix Figure 3).

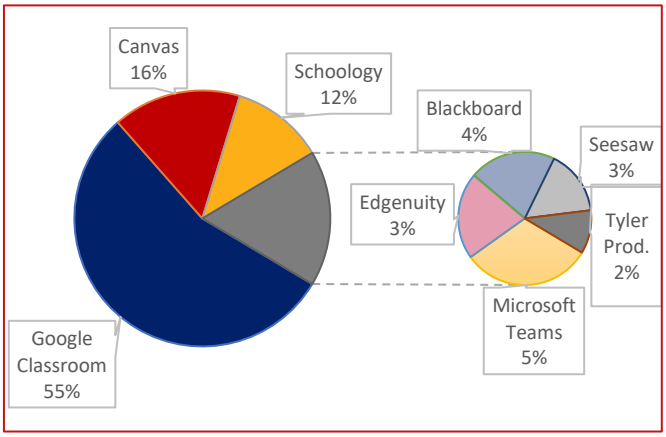
81% of LEAs have an LMS system in place.

Within our respondent pool, 81 percent of LEAs are currently making use of an LMS system, and 8 percent have plans for an LMS system. While significant variation exists between use of LMS systems by county, no clearly discernable trend exists. The same applies to the use of LMS systems in rural LEAs taken against urban LEAs.

LMS systems are employed for a wide range of tasks and much of the value in an LMS system is to provide multiple functions within one environment. While LEAs often use these functions simultaneously, all LEAs do not make universal use of all functionalities within their LMS beyond the distribution of content. In our sample 54 percent of LMS users reported to be using their system to record student grades, with 42 percent using the system to share grades with those students. The last two uses were for tracking and reporting students' attendance, which was done by 28 percent and 25 percent of LEAs, respectively. (Provided in Appendix Table 8).

By far the most used system was Google Classroom, being used by 55 percent of our responding LEAs. Next were Canvas and Schoology which were used by 16 and 12 percent of the LEAs, respectively. Finally, were a variety of products such as Blackboard and borderline LMSs like Edgenuity while some LEAs, lacking an LMS solution, use Microsoft Teams in lieu of an LMS.

Figure 9: Learning Management Systems by Use



X. IT HELP DESK

The purpose of an IT Helpdesk is to provide a service to instructional staff and students to alleviate technical problems in access to digital solutions. Almost seven out of every eight responding LEAs (85.3 percent) indicated that they make use of a help desk for technical aid; however, almost one quarter (24 percent) of technology representatives with a helpdesk indicated that their helpdesk does not fully meet their needs. Asking a similar question from the curriculum representatives, we received remarkably similar responses both as a whole and within LEAs. While there is lower use in charter districts, there are no clear trends either between district type or counties in the use of helpdesk solutions. (Additional detail provided in Appendix Tables 9 and 10).

85% of LEAs have an IT Help Desk system and, from them, **24%** believe that their help desk system does not meet their needs.

Although 85 percent of LEAs indicated that they do have a help desk available for instructional staff, the remaining 15 percent said that instructional staff reach out to IT, instructional coaches, or other instructional staff in equal amounts. For those LEAs providing additional options, they indicated that they call their technology vendors and additionally indicate that principals fill in as a technology helpdesk when needed.

Principals sometimes fill in as technology helpdesk for their instructional staff.

For the student population, (allowing for multiple responses) 73 percent of LEAs indicated that students reach out to their teacher for technology support, increasing the already noted onus on teachers at LEAs. After their teachers, students were then most likely to contact the LEA's technology department directly whenever that option existed. Most notable were some of the open-ended answers, with the students from several LEAs needing to contact front office staff, counselors - and on one occasion – the school principal.

73% of LEAs indicate that their teachers serve as primary technology support to their students.

XI. CONCLUSION

Analysis of the data gathered by the 2021 Office of Digital Teaching and Learning (ODTL) Opportunity Assessment indicated three substantive areas of focus: student connectivity, teacher training, and technology support. These substantive areas were notable for both the breadth and the severity of need. Many LEAs noted the strain that was already on them, and that these were far from the only needs that they had, merely the most pressing and dominant needs that they are currently experiencing.

A deeper read of the data indicates that student connectivity is both a cost and availability concern (consistent with previous understanding). Connectivity costs are near a universal challenge for LEAs, where many LEAs noted not only limited funding overall, but also the ability to continue funding connectivity after one-time COVID related funding runs out. However, connectivity presents additional issues for some LEAs with no options available to purchase due to as a lack of broadband service to portions of their district.

Instructional staff training also emerged as a key concern. While instructor training is often available, training that meets the needs of LEAs is not as readily available. Through discussions and assessment responses, LEAs expressed a need for (and a lack of) instructional staff training where time and value is paramount. Key areas identified within the training needs went beyond digital instruction on the whole, but also pointed to specific needs such as trainings related to Arizona's Educational Technology and Computer Science Standards.

Technology support, the final key concern, was seen quite broadly. These included LEA's consistently the importance of staff, and the need for resources to hire technology coaches, increase their IT department capacity, and simultaneously reduce the current burden on instructional and administrative staff to handle IT concerns.

We believe that, this first pass at the Opportunity Assessment provides a snap-shot of the current context for supporting and developing digital teaching learning within Arizona. That said, assessing the current state and continuing needs of digital teaching and learning within the state is an ongoing process. As constraints are remedied or supplanted by other demands, the assessment process will evolve and continually provide feedback on the digital teaching and learning needs of Arizona's students.

XII. ABOUT THIS STUDY

This study was released in March 2022 and produced as part of the recommendation from the ADE Technology Task Force to proceed with the formation of the Office of Digital Teaching and Learning at the Arizona Department of Education. The study sets the baseline against which the Office of Digital Teaching and Learning, together with a community of educators and solution experts, will implement programmatic activities oriented to the provision of diverse technology solutions for K12, including devices, adequate connectivity, and digital skills so students can achieve their full potential. This document was researched, analyzed, and authored by Jason Shumberger, PhD, Data Analyst for the Office of Digital Teaching and Learning. Contributors and editors from the Assessment Board, staff from the Office of Digital Teaching and Learning, ASU Mary Lou Fulton Teachers College and the communications team at the Arizona Department of Education.

XIII. APPENDIX

Appendix Section 1: More Information About Sample Representativeness:

The respondent pool was further evaluated across several additional attributes to determine appropriateness of generalizing to the broader population of LEAs in the state of Arizona. Most attributes showed a strong agreement between the broader state and the respondent pool, indicating that extrapolation is not unwarranted. However, several attributes such as charter vs district and rate of grade service differ by enough that caution should be urged for breakouts with those attributes.

Diving further into the question of geographic representativeness, we looked more directly at the completion rates for LEAs classified as serving urban and rural areas. Sixty-nine percent of our responses came from Urban classified LEAs, while 31 percent came from rural classified LEAs. While numbers indicate greater representation of urban classified LEAs, urban classified LEAs compose 85 percent of all LEAs across the state. As a result, our sample provides for greater percentage representation of rural LEAs against the population of LEAs in the state.

As income levels and English language learner percentages impact LEA resources and needs, we evaluated our sample for representativeness against the broader state. The average income eligibility rates within LEAs across the state is 38.8 percent, while our sample population had an average rate of 38.4 percent.[2] The average English language learner rate within LEAs across the state is 6.1 percent, while ODTL's respondent pool averaged 7.1 percent. Both rates indicate that respondent pool LEAs are representative of state-wide LEA rates.

Additionally, we considered diversity across Arizona school types – both Charter Districts and School Districts. By these measures, both Charter and Public Districts were well represented with 68 percent of the responses from Public Districts and 31 percent of the responses arriving from Charter Districts. Public district responses represented 30 percent of all public districts across the state. While only 9 percent of charter districts were represented in assessment responses, ODTL is allayed by the fact that a wide variety of charter districts by size and geography are well represented.

Appendix Table 1: Subject Categories included in the Assessment

Section Number (As conducted)	Subject Area
3	Teacher Support
4	Assessment and Grading
5	Digital Content
6	Classroom Solutions
7	Student Support
8	Digital Roadmap
9	Teacher and Staff Devices
10	Student Devices
11	Connectivity at Home
12	Learning Management Systems
13	IT Help Desks
14	IT Policies and Procedures
15	IT Roadmap

[2] The rates explained in this section are not weighted to account for school size, and instead are averaged as LEA rates. In addition, as we used masked data, these rates likely underestimate rates in LEAs with smaller student populations. These numbers are not to be construed as student population averages in the state.

Appendix Table 2: Sample Representativeness Table

	Sample Mean	Population Mean
Percent Charter	31%	60%
Percent Urban	68%	85%
% Meeting Income Eligibility Level 1 or 2	38.4%	38.8%
English Language Learner Rates	7.1%	6.1%

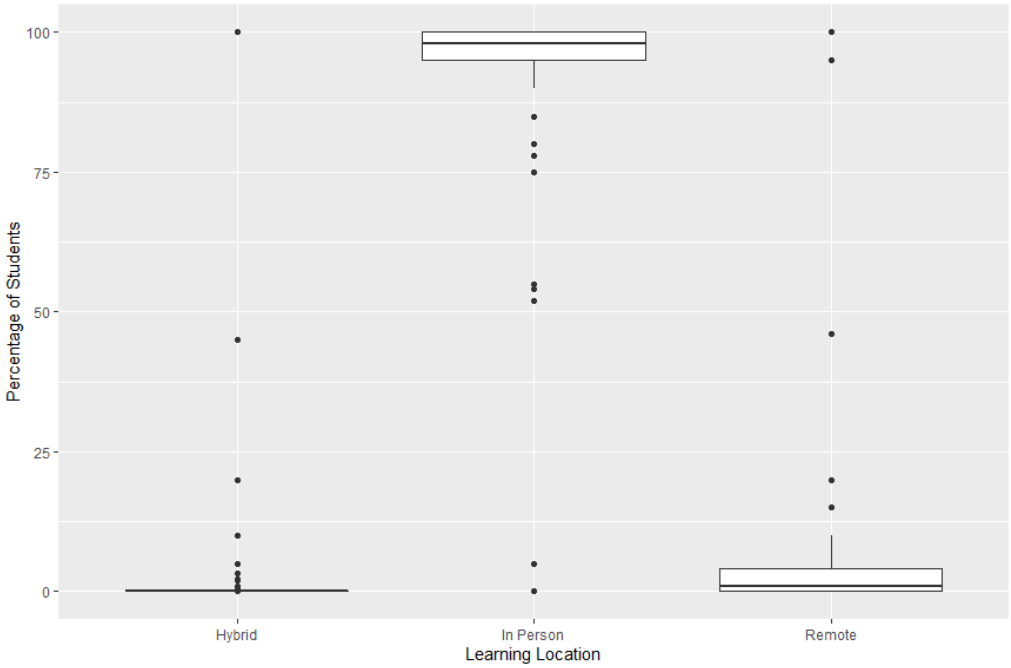
Appendix Table 3: Percent Grade Coverage

	Percent Servicing (Self Reported Sample)	Percent Servicing (All Arizona LEA Population)	Mean Number of Students Serviced (Sample)	Mean Number of Students Serviced (Population)
Grade K through 2	84.4%	61.9%	837	322
Grades 3 through 6	85.4%	69.1%	1224	455
Grades 6 through 8	85.4%	64.6%	1012	369
Grades 9 through 12	60.2%	47.3%	1137	490
Total Size			3951	1544

Appendix Section 2: Additional Figures and Tables

Appendix Figure 1 Percentage of Students by Learning Location

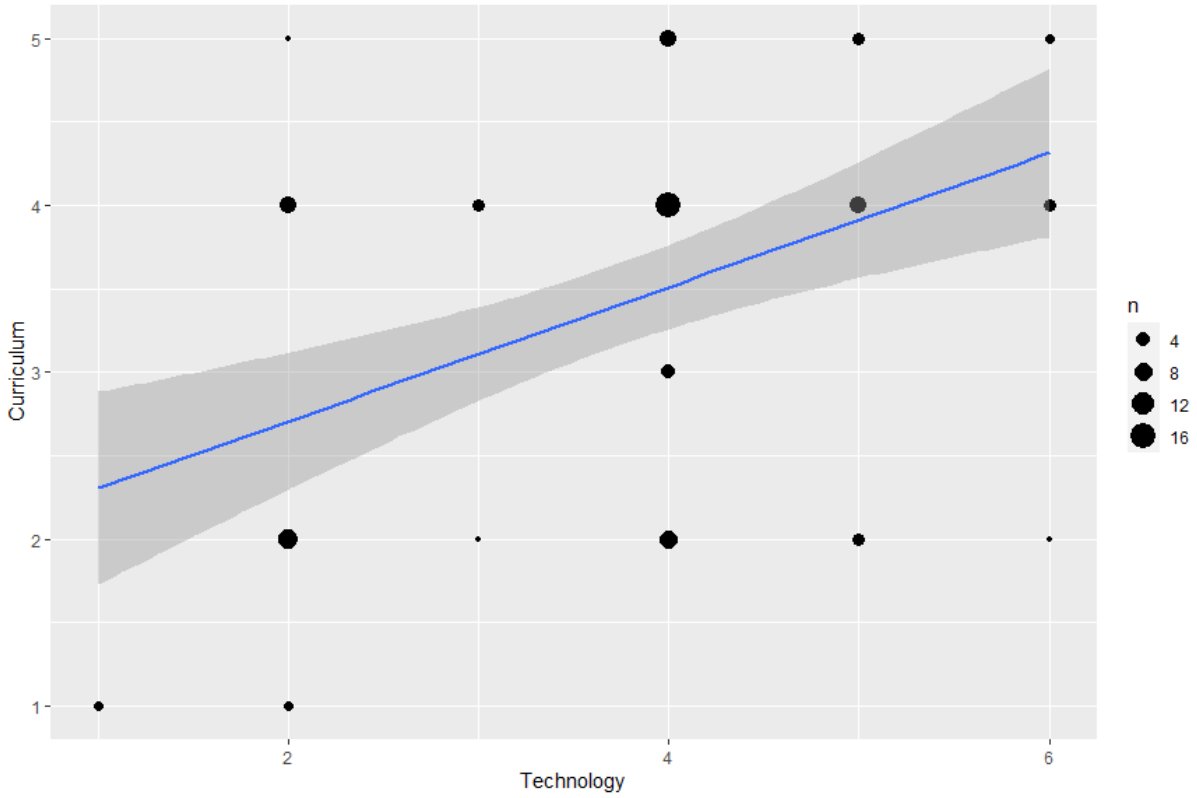
(Question 6.2: Tell us about the learning modality of your students this school year. **Percentage** of students attending school in person, virtual or hybrid.)



Appendix Figure 2: Within LEA Correlation on Roadmap Question

As the same question was asked of curriculum and technology representatives within a single LEA, it allowed evaluation of within unit of analysis agreement on the roadmap question. Broadly speaking, the positive correlation provided a point of validation for the assessment instrument.

(Questions 8.2 and 15.2: After completing this assessment, where do you believe that your district currently falls in the overall spectrum of "readiness" for digital teaching and learning?)



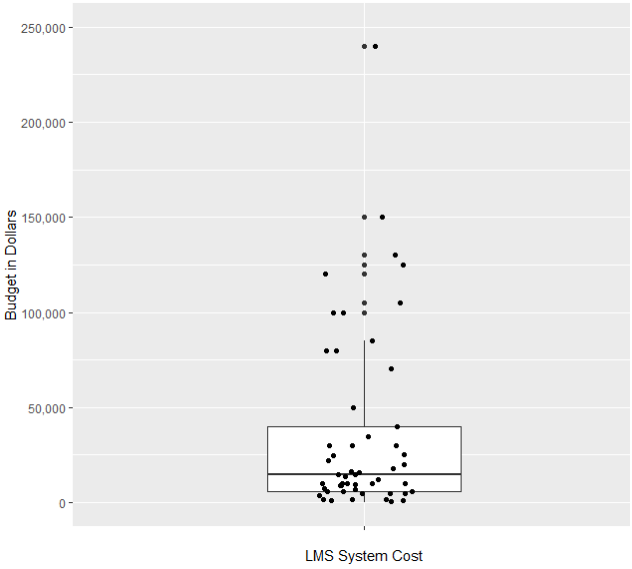
Appendix Table 4: Connectivity Collection by County

(Question 11.2: Has your district gathered data from households/students regarding their access to internet or any form of connectivity at home?)

County	No, we do not have any data about our student connectivity at home	Yes, we gathered student connectivity data one time in response to COVID	Yes, we have continued to gather student connectivity data (more than once)	Grand Total
Apache		2	1	3
Cochise	1	1	1	3
Coconino		3	2	5
Gila			1	1
Graham	1	2		3
Greenlee			1	1
Maricopa	6	19	14	39
Mohave	3	1	3	7
Navajo		5	1	6
Pima		2	5	7
Pinal		4	2	6
Santa Cruz	1	1	1	3
Yavapai		5	3	8
Yuma		5	1	6
Grand Total	**12**	**50**	**36**	**98**

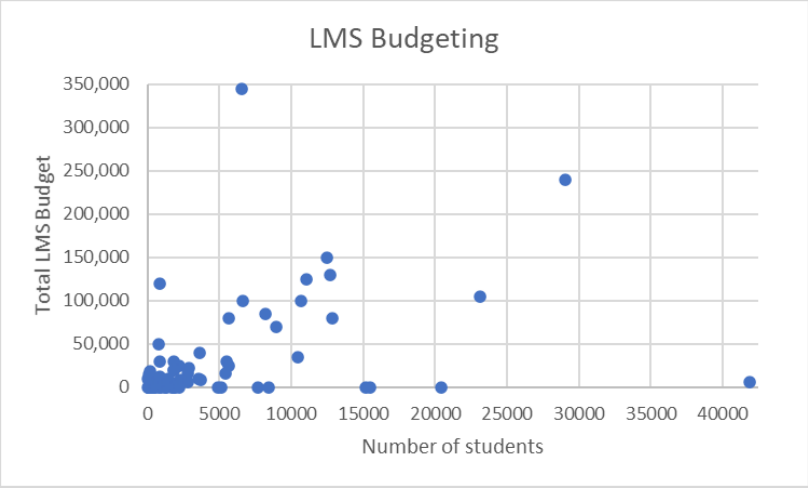
Appendix Figure 3: Boxplot of LMS Budget Expenditures

(Question 12.6: What is your current annual budget to pay for your LMS?)



Appendix Figure 4: Scatter of LMS budget plotted against the number of students in the LEA)

(Question 12.6: What is your current annual budget to pay for your LMS? against Arizona Department of Education enrollment numbers beginning the current school year)



Appendix Table 5: Technology Priority Rankings for LEAs

(Question 15.3: After completing this assessment and after understanding where the opportunities for improvement in digital learning reside in your district, how would you rank the order of priority of interventions needed for the year ahead?)

Ranking	Refresh Instructor Devices	Refresh Student Devices	Connectivity	Tech Support	Improve LMS	Implement Policies
1	13.73%	20.59%	**22.55%**	17.65%	13.73%	11.76%
2	13.73%	11.76%	13.73%	23.53%	15.69%	21.57%
3	19.61%	12.75%	16.67%	18.63%	10.78%	21.57%
4	13.73%	26.47%	13.73%	17.65%	17.65%	10.78%
5	24.51%	14.71%	7.84%	12.75%	22.55%	17.65%
6	14.71%	13.73%	25.49%	9.80%	19.61%	16.67%
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Average	3.66	3.44	3.47	3.14	3.78	3.51
Top 3	47%	45%	53%	60%	40%	55%
Top 2	27%	32%	36%	41%	29%	33%

Appendix Table 6: Curriculum Priority Ranking for LEAs

(Question 8.3: After understanding where the opportunities for improvement in digital learning reside in your district, how would you rank the order of priority of interventions needed in the year ahead?)

	Professional Training Support	**Enhance Digital Content**	**Implement Tech Solutions for Classroom**	**Support for Remote Students**	**Implement Solutions to Remotely Assess Students**
Ranked 1	44.66%	15.53%	22.33%	12.62%	4.85%
Ranked 2	27.18%	22.33%	28.16%	11.65%	10.68%
Ranked 3	13.59%	38.83%	19.42%	15.53%	12.62%
Ranked 4	10.68%	11.65%	14.56%	30.10%	33.01%
Ranked 5	3.88%	11.65%	15.53%	30.10%	38.83%
	100.00%	100.00%	100.00%	100.00%	100.00%
Average Rating	2.02	2.82	2.73	3.53	3.90
Top 2	71.84%	37.86%	50.49%	24.27%	15.53%
Top 3	85.44%	76.70%	69.90%	39.81%	28.16%

Appendix Table 7: Use of LMS Systems by County

(Question 12.2: Does your district use a Learning Management System (LMS)?)

	No, we do not have an LMS	We are exploring LMS implementation but have not finalized it	Yes, we have already implemented and are currently using an LMS
Apache	33%	0%	67%
Cochise	0%	0%	100%
Coconino	20%	0%	80%
Gila	0%	0%	100%
Graham	33%	33%	33%
Greenlee	0%	0%	100%
Maricopa	13%	8%	79%
Mohave	0%	14%	86%
Navajo	0%	0%	100%
Pima	0%	14%	86%
Pinal	0%	17%	83%
Santa Cruz	33%	0%	67%
Yavapai	25%	13%	63%
Yuma	17%	0%	83%
Grand Total	**12.24%**	**8.16%**	**79.59%**

Appendix Table 8: Functional Use of LMS Systems

(Question 12.5: Please select the different ways in which your district uses the LMS)

To facilitate learning through curriculum delivery	96.6%
To feed daily attendance data from the LMS to the SIS for state reporting capabilities	24.7%
To record students' grades	53.9%
To post / share grades with students	41.6%
To track students' daily attendance	28.1%

Appendix Table 9: Help Desk Use by County

(Question 13.2: Does your district have an Information Technology Help Desk?)

County	No	Yes	Yes, but it does not completely fulfil needs
Apache	0.0%	100.0%	0.0%
Cochise	33.3%	66.7%	0.0%
Coconino	40.0%	40.0%	20.0%
Gila	0.0%	100.0%	0.0%
Graham	0.0%	33.3%	66.7%
Greenlee	0.0%	100.0%	0.0%
Maricopa	10.3%	66.7%	23.1%
Mohave	57.1%	42.9%	0.0%
Navajo	16.7%	50.0%	33.3%
Pima	0.0%	42.9%	57.1%
Pinal	16.7%	66.7%	16.7%
Santa Cruz	0.0%	100.0%	0.0%
Yavapai	12.5%	75.0%	12.5%
Yuma	0.0%	83.3%	16.7%
Grand Total	**14.3%**	**64.3%**	**21.4%**

Appendix Table 10: Helpdesk Use by District Type

(Question 13.2: Does your district have an information technology helpdesk?)

LEA Type	No	Yes	Yes, but it does not completely fulfil needs
Charter	25.00%	53.13%	21.88%
District	10.00%	70.00%	20.00%
Grand Total	**14.71%**	**64.71%**	**20.59%**

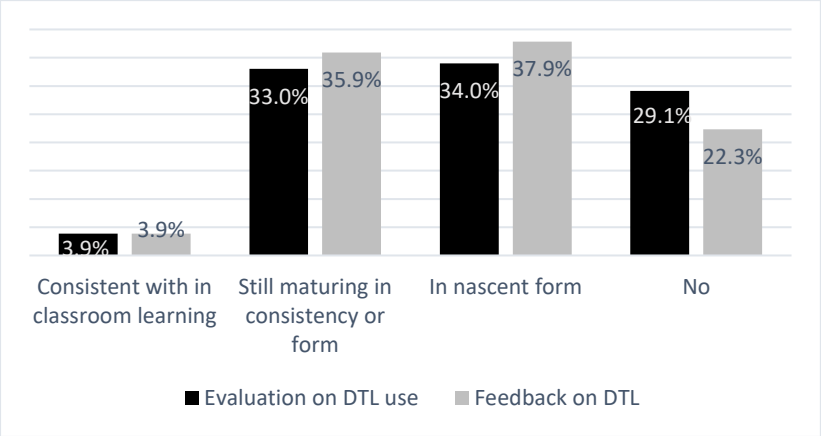
Appendix Table 11: The Use of Remote Assessment Against Implementation of Remote Assessment Policy

(Questions 4.5: Does your district have ways to remotely assess and evaluate students' performance? And question 4.7: Does your district have a district grading and assessment policy for digital learning?)

Does your LEA currently have an assessment Policy in place?	Does your LEA have ways to remotely assess and evaluate student performance?				
	Yes, robust and consistent with in person learning	Yes, but still maturing in consistency and form	Yes, still nascent	No	Grand Total
No	61.90%	72.22%	78.95%	88.89%	72.82%
Yes	38.10%	27.78%	21.05%	11.11%	27.18%

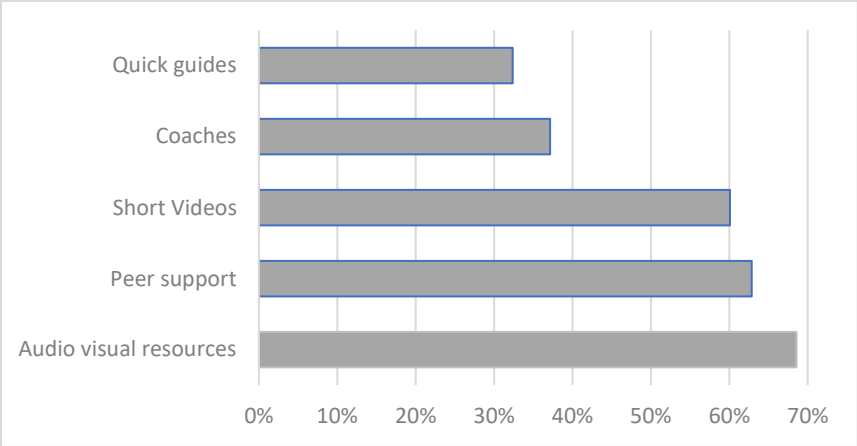
Appendix Figure 6: Evaluation on Digital instruction

(Question 3.8:Does your district have practices in place to evaluate instructional staffs' digital instruction?)



Appendix Figure 7: English Language Learner Remote Support

(Question 7.9: What resources are in place at your district to support remote English Language Learners?)



Appendix Table 12: Policy subject area implementation

(Question 14.3: Which ones of these policies and local procedures have you drafted or put in place for digital learning? Check all that apply)

LEA Policy Implementation Rates	
Student technology acceptable use policy	65%
Student laptop loan agreement and consent form	52%
Procedures to keep data private (FERPA compliant)	52%
Disaster recovery policies	43%
Procedure for lost and stolen devices	41%
Inventory management procedures	40%
Data security agreements	30%
Incident response plan	28%
Data breach response policies	28%
Auditing policies	22%
Security controls review policy	18%