Electronic Technology in NL Schools

An Environmental Scan, 2015-16

Education Library / Teaching and Learning Commons, Memorial University

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Introduction

Purpose

As part of its overall strategy of supporting the work of the Faculty of Education, the Teaching & Learning Commons (TLC) provides leadership in terms of access to, and expertise in, the usage of Information, Communication and Learning technologies (ICLTs). This leadership is guided by the Faculty of *Education's Strength through Collaboration: Strategic Plan 2015-2020*. Specifically, this environmental scan will demonstrate how we plan to use this data to, "Strengthen our role as a leader in distance education and learning technologies to: a. further integrate innovative technology within the curricula… and c. ensure access to and in-services for new resources and technologies which support innovative teaching and learning environments." Memorial University is the sole teacher preparation institution in Newfoundland Labrador so it is important that the learning environment it provides for its Education students is reflective of the reality in which most of the graduates will work. This study will assist by providing up-to-date information that will inform both acquisition and implementation.

Significant investment has been made toward the provisioning of various aspects of ICLT support in the province's classrooms. System-wide investments—Microsoft™ licensing, for example—have been implemented that impact students on a relatively equal basis. Other investments such as onsite computer equipment have been purchased using monies allocated from the school district budgets. The result is a mosaic that differs from classroom to classroom and, in all likelihood, from school to school. The overall picture of ICLT usage in the classrooms, as one might expect, is complex and not completely mapped. As such, it is difficult for the TLC to determine where exactly its resources should be best expended in order to prepare pre-service teachers for the province's classrooms in a way that meshes with existing and anticipated practice patterns.

This document will outline the results of a study undertaken to inform the TLC's decision making for the next 3-5 years. It is hoped that the results will enable the TLC to provide Education students with competency in using the various technologies they can reasonably expect to find in the province's classrooms.

Research Questions

For the various key stage levels and subject areas, this study will address these items:

1. To what extent, as measured as an approximate percent of available in-class time, are various hardware/software platforms being utilized? These include:
    a. School-supplied PCs and Laptops;
    b. School-supplied mobile devices (iPads, Android tablets, and / or Chromebooks);
    c. Student-supplied electronic devices (BYOD);
    d. Interactive Whiteboards;
    e. Subscription-based electronic products, tools, and applications, e.g. Powtoon and Glogster;
    f. Specialized equipment such as 3D printers, CNC devices (computer numerical control machines, routers, and other industrial arts equipment), and Digital Laboratory Interfaces.
2. Specifically, what ICLTs are in widespread use?
3. Specifically, what ICLTs are in the early-adoption stage and showing promise (as judged by the users)?

Methodology

Budget and time constraints did not permit the use of direct observational data for this study. It was decided, therefore, to develop and implement an online survey and administer it to a randomly-chosen sample of educators in the province of Newfoundland and Labrador.

The survey was developed based on the results of a series of informal interviews with people responsible for various aspects of educational technology in the province's classrooms. These included program specialists at both the English School District and the Department of Education. The respondents were asked (1) what, to the best of their knowledge, were the most commonly used hardware and software tools and (2) what hardware and software tools were receiving active support at the present time. This was supplemented by an examination of current literature regarding popular and useful items of educational technology.

Based on this, the following categories were chosen for the items in the survey instrument:

- General demographic information;
- Self-reported use of:
    - Interactive Whiteboards,
    - tablets and other portable devices,
    - computer labs,
    - social media, and
    - other specific hardware and software that was either identified in the interviews or was considered worthwhile based on reports from trade journals.

The survey was developed for online delivery using Survey Monkey. A copy of the items included in the survey is included in Appendix A.

The Sample

The desired population was all practicing teachers in the NL K-12 public school system. Both the English and French School Districts were approached for permission to use their employees as possible subjects. While no response was received from the French School District, permission was obtained from the English District.

An email list of 4900 teachers was obtained from the English School District. The district did inform the researchers that because the list was self-administered (i.e. inclusion on it was voluntary in nature) it could be inaccurate or incomplete. A random sample of 800 email addresses was chosen from the original list. The list was tested by sending an initial email to the prospective respondents. Of the 800 emails sent out, 53 (or 6%) were returned as undeliverable, thus potentially reducing the sample size. To compensate for this, another random draw was made from the remaining emails on the original list. A working sample of 801 potential participants was thus created. Of these, one participant's email later returned a vacation message, thus leaving an overall initial pool of 800 potential participants.

Delivering the Survey

The online survey tool used, Survey Monkey, has the ability to deliver a unique link to each potential participant. This means that the system can track the email addresses used by the respondents that have completed the survey. The study took advantage of this by sending several reminders, but only to those who had not yet completed the survey. Table 1 documents the reminders:

2/15/2016	Mon.	Sent invitation message to 801 contacts	First Contact
2/18/2016	Thu.	Sent reminder message to 608 contacts	First Reminder
2/18/2016	Thu.	Sent reminder message to 27 contacts	Reminder to finish partially complete surveys
3/2/2016	Wed.	Sent reminder message to 501 contacts	Second reminder
3/15/2016	Tue.	Sent reminder message to 456 contacts	Final Reminder

TABLE 1: LIST OF SURVEY REMINDERS

The final reminder only yielded an additional 33 completions and it was decided that the majority of those willing or able to answer the survey had already done so. At the time of closing, a total of 377 out of a possible 800 respondents had completed the survey, giving an overall response rate of 47%.

Validating the Sample

The potential existed that Gender and Number of Years of Service could bias usage of educational technology. It was therefore important to ensure that the respondents were representative of the population in these regards.

A chi-square test was done to compare the number of males and females who completed the survey with the most recent provincial male / female teacher population breakdowns. The results indicated no significant difference. The table for this can be found in Appendix B, Table 33: Breakdown by Gender.

In a similar way, a chi-square test was applied to check the sample by years of service. The p-value of this test was 0.00590 ($p<.05$), which indicates non-random differences between the ages of those in the sample and that of the population. An examination of the actual values (see Appendix B, Table 34) indicates that the differences, though not random, are small.

A similar analysis was done to determine if the sample was representative by district region. Table 35 in the appendix shows the results. Once again a chi-square was applied and the results indicated that the observed differences are likely due to chance.

Limitations

There are several limitations to this survey. First, since the district-supplied email list was the only means by which subjects were chosen and contacted, this means that the respondents are only those who (1) typically respond to their district supplied email addresses and (2) are willing and able to complete online surveys for research.

Second, this study relies on self-reported data, which brings along all of the usual associated limitations, including:

- the issue of honesty; it is assumed that the respondents have given truthful responses;
- the respondent's ability to understand the question as posed; and
- the possibility of response bias, whether intentional or not.

Third, and most important, the response rate, at 47%, was significantly less than the desired goal of 70%. Because of this, caution must be used when extrapolating the results to the entire population.

Performing the Analysis

Survey Monkey's and, to a lesser extent, Microsoft Excel's analysis tools provided the statistics that will be reported in the next section.

The Results

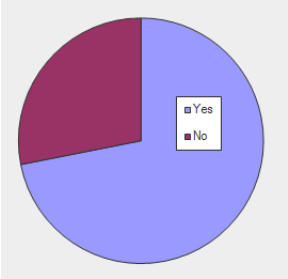
Interactive Whiteboards

As can be seen from Table 2, only 6% of the respondents indicated that they did not have any access to some sort of electronic whiteboard. The SMART™ Boards were by far the most common with the Teamboards being a distant second. Other brands such as Activ and Mimeo boards were not represented in the sample at all.

Does the classroom you use most often have an Interactive Whiteboard? If it has more than one, check all that apply.		
Answer Options	Response Percentage	Response Count
It has a SMART board	58.9%	216
It has a Teamboard	36.8%	135
It has an Activ Board	0.0%	0
It has a Mimeo Board	0.0%	0
It has a non-interactive display (a projector and screen, for example)	2.7%	10
It has no available large screen display capability	6.0%	22
Other (please specify)	4.1%	15
Answered question		367
Skipped question		10

TABLE 2: AVAILABILITY OF INTERACTIVE WHITEBOARDS

Table 3 shows that the majority of respondents (72%) indicated that they used an interactive whiteboard on a regular basis.



Do you use an Interactive Whiteboard on a regular basis?		
Answer Options	Response Percentage	Response Count
Yes	71.9%	266
No	28.1%	104
Answered question		370
Skipped question		7

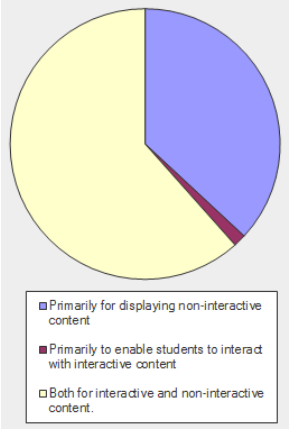
TABLE 3: REGULAR USAGE OF THE WHITEBOARD

Table 4 shows the results to the above question broken down by grade level. The results show an approximately equal rate of usage across all grade levels.

Do you use an Interactive Whiteboard on a regular basis?				
Answer Options	K, G1-3	G4-6	G7-9	HS
Yes	65 (79%)	78 (82%)	76 (80%)	85 (75%)
No	17	17	19	29

TABLE 4: WHITEBOARD USAGE BROKEN DOWN BY GRADE

Only those who indicated that they used Interactive Whiteboards on a regular basis were asked a series of follow-up questions. The first one asked respondents to classify the way they use the Interactive Whiteboards (see Table 5).



Which best reflects your usage of the Interactive Whiteboard?		
Answer Options	Response Percentage	Response Count
Primarily for displaying non-interactive content such as presentation slides, videos, images, etc.	36.9%	97
Primarily to enable students to interact with interactive content such as games, simulations, etc.	1.5%	4
Both for interactive and non-interactive content.	61.6%	162
Answered question		263
Skipped question		114

TABLE 5: TYPES OF USAGE OF THE INTERACTIVE WHITEBOARD

It is interesting to note the differences between grades as shown in Figure 1. Notice that as the grade levels advance the respondents reported a decrease in activities that require interaction while, at the same time, the reported instances of non-interactive uses increase.

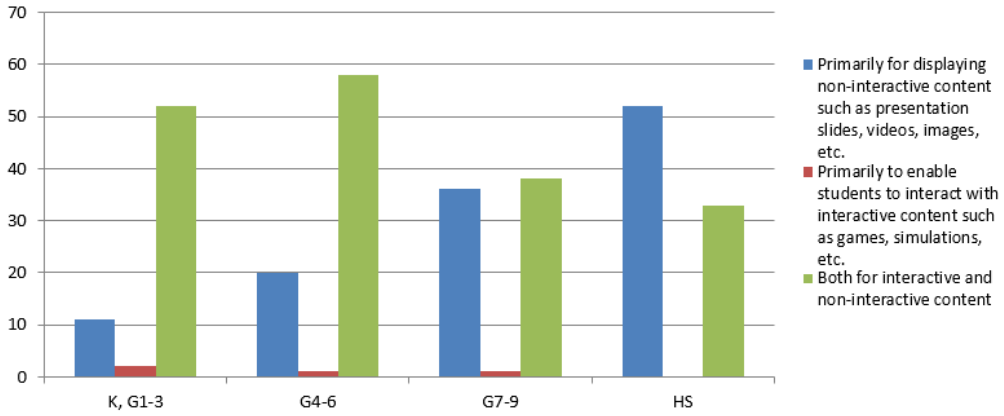
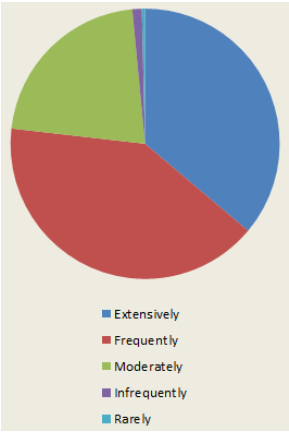


FIGURE 1: TYPES OF USAGE OF THE INTERACTIVE WHITEBOARD, BY GRADE LEVEL

For the sample respondents teaching in the higher grades, the Interactive Whiteboard is used more as a large non-interactive display unit.

The respondents were asked how often they used the Interactive Whiteboards on a 5-point scale that ranged from "Extensively" to "Rarely." The precise definitions of those terms, as used in this study, can be found in Appendix C.

The results show that the Interactive Whiteboards were used either infrequently or rarely by only 4 out of the 263 respondents who answered the question. The remaining 259 reported either Moderate, Frequent or Extensive use. The rating average was obtained by counting "Extensively" as 5, "Frequently" as 4 and so on. The overall rating average of 4.11 would indicate that "Frequently" could be counted as a typical response.

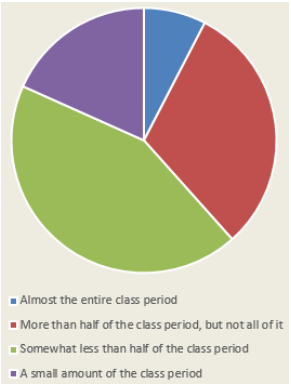


Which best describes the frequency with which the Interactive Whiteboard is used in your classes?							
Answer Options	Exten-sively	Freq-uently	Moder-ately	Infreq-uently	Rarely	Rating Average	Response Count
	95	107	57	3	1	4.11	263
Answered question							263
Skipped question							114

TABLE 6: FREQUENCY OF INTERACTIVE USAGE

It is important to note that out of the 114 respondents who skipped the question, 60 were people who indicated that they do not use the Interactive Whiteboards at all.

The data also indicates that the usage of the Interactive Whiteboard is a significant part of each class period for those who use them. Notice from Table 7 that 74%, or roughly three-quarters of the respondents, indicated that they used the Interactive Whiteboard either somewhat less than half the class period or more than half the class period, thus indicating that the use of Interactive Whiteboard, in its preferred mode for most teachers, was a significant part of the class period, but not all of it.



How much class time do you spend using the Interactive Whiteboard?		
Answer Options	Response Percentage	Response Count
Almost the entire class period	7.6%	20
More than half of the class period, but not all of it	30.8%	81
Somewhat less than half of the class period	43.3%	114
A small amount of the class period	18.3%	48
Answered question		263
Skipped question		114

TABLE 7: PORTION OF CLASS TIME TYPICALLY SPENT USING THE INTERACTIVE WHITEBOARD

The respondents were presented with a list of things that could be done with the Interactive Whiteboard and were asked to rank them in order from (5) done most often to (1) done least often. The results are presented below in Table 8.

Rank your usage of the Interactive Whiteboard from greatest (5) to least (1)							
Answer Options	5	4	3	2	1	Rating Average	Response Count
Displaying presentations (e.g. PowerPoint, Google Slides, Prezi, etc.)	83	27	32	25	50	3.31	217
Interacting with content created for the Interactive Whiteboard (using SMART Notebook, etc.)	50	38	24	57	51	2.90	220
Displaying video	24	71	59	34	23	3.18	211
Displaying content from the web	35	60	68	45	23	3.16	231
Interacting with content from the web (games, simulations, web 2.0 tools, etc.)	37	34	47	62	72	2.61	252
Answered question							261
Skipped question							116

TABLE 8: TASKS DONE ON THE INTERACTIVE WHITEBOARD

Respondents use the Board for a wide variety of tasks, with no single usage type taking an appreciably higher position. An average for each scenario was calculated by weighing the most often choice as a 5, the second as a 4 and so on. Notice that the highest ranked item was "Displaying Presentations" at an average of 3.31.

Overall, the average ranking for each type of task was roughly the same. When broken down by grade level, however, one difference became apparent. Table 9 and Figure 3 displays those responses.

	K, G1-3	G4-6	G7-9	HS
Displaying presentations	2.75	3.02	4.19	4.05
Interacting with content created for the IWB	3.27	2.81	2.79	2.83
Displaying video	2.88	3.08	3.18	3.17
Displaying content from the web	3.05	3.38	3.07	3.08
Interacting with content from the web	3.21	2.91	2.22	2.13

TABLE 9: USAGE SCENARIOS BY GRADE LEVEL

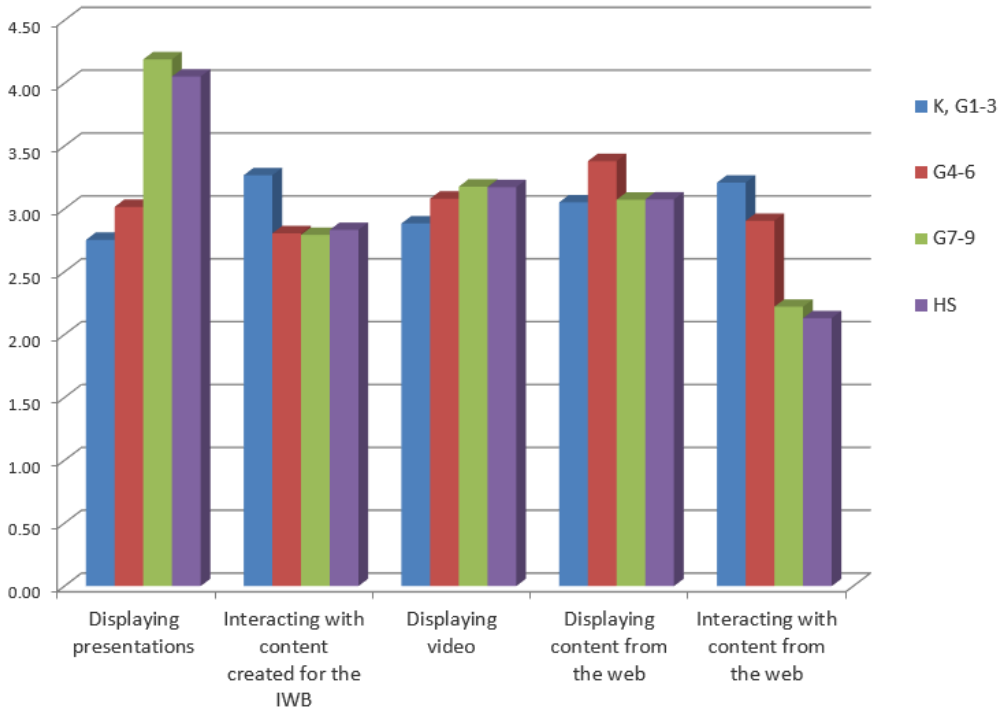


FIGURE 3: USAGE SCENARIOS BY GRADE LEVEL

First examine the four bars for "Displaying presentations" and notice that intermediate / secondary teachers ranked it high—approximately 4.19 and 4.05 on average—while primary / elementary teachers ranked it considerably lower at 2.75 and 3.02.

Second, examine "Interacting with content from the web" and notice the reverse effect. As grade level goes up there is a steady decline in the ranking, indicating that the respondents in the higher grades show a preference for static content while respondents teaching younger students show a preference for interactive content.

Tablets and Other Mobile devices

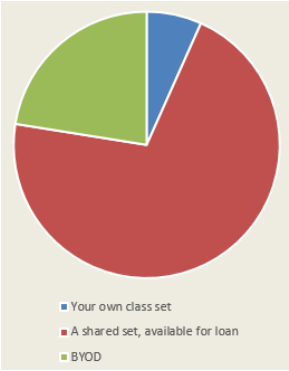
Respondents were first asked whether they used mobile devices on a regular basis. Overall 78.7% of the respondents indicated that they did.

Do you make use of mobile devices (Tablets, iPods, Smart Phones and / or Chromebooks) in your classroom?		
Answer Options	Response Percentage	Response Count
Yes	78.7%	289
No	21.3%	78
Answered question		367
Skipped question		10

TABLE 10: OVERALL USAGE OF MOBILE DEVICES

Only those who indicated that they did use mobile devices were asked a series of follow-up questions. The remainder of this section presents those results.

The most common integration of mobile devices is a class set available for loan. Overall, approximately 70.9% of the respondents indicated that a class set was available to them. BYOD at 22.5% was next and classrooms equipped with dedicated class sets at 6.7% was a distant third.



Regarding Mobile devices, which choice best describes your situation?		
Answer Options	Response Percentage	Response Count
Your own class set	6.7%	19
A shared set, available for loan	70.9%	202
BYOD (Bring Your Own Device) -- I mainly rely on student-supplied devices	22.5%	64
Answered question		285
Skipped question		92

TABLE 11: MOBILE DEVICE SITUATION

Figure 4 shows the percentage response for each category broken down by grade level.

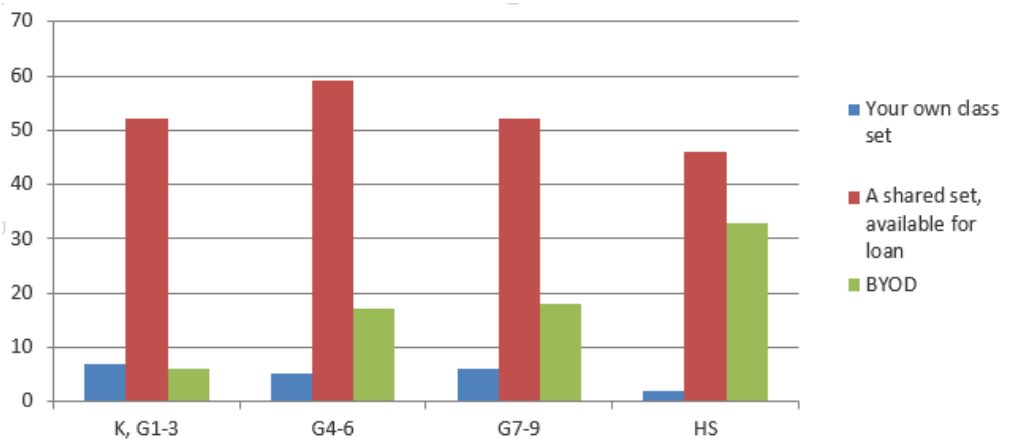
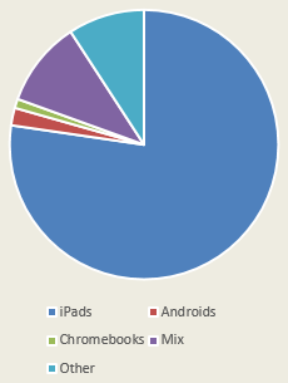


FIGURE 4: MOBILE DEVICE TYPES BY GRADE LEVEL

Shared sets of devices showed a slight decline in use / availability in high school (45%) when compared to the prevalence (58%) indicated by the Grade 4-6 teachers. Notice also the increasing incidence of BYOD as the grade level advances.

The respondents were asked whether the mobile devices they used were iPads, Androids, Chromebooks, or a mix. Table 12 below gives the results. It is clear that iPads are by far the most popular device.



Regarding Mobile devices, which choice best describes your situation?		
Answer Options	Response Percentage	Response Count
Primarily (more than 75%) iPads	77.3%	218
Primarily (more than 75%) Android Tablets	2.1%	6
Primarily (more than 75%) Chromebooks	1.1%	3
A mix of several types, with no one type being dominant.	10.3%	29
Other (please specify)	9.2%	26
Answered question		282
Skipped question		95

TABLE 12: TYPES OF MOBILE DEVICES

When the results were broken down by grade level, the incidence of "a mix of different types" and "other" became more prevalent with advancing grade level, a result consistent with that displayed in Figure 5.

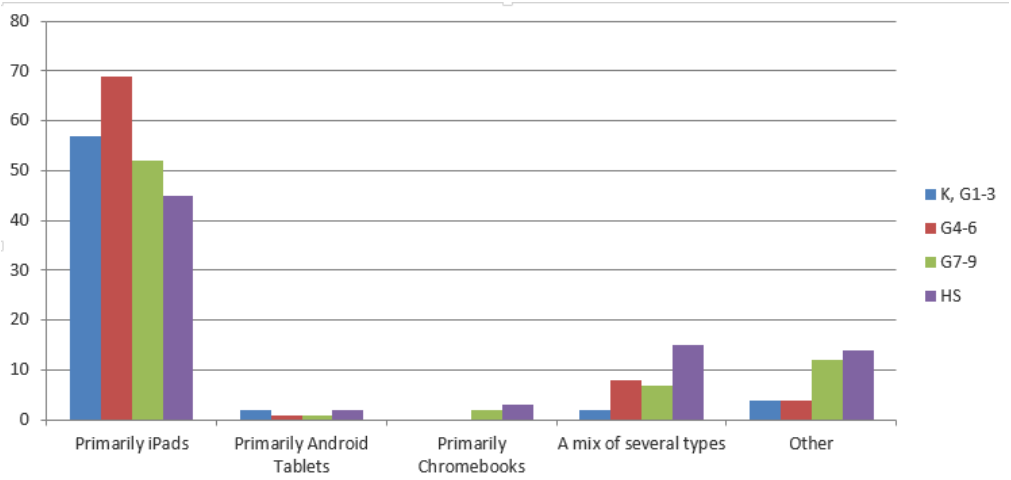
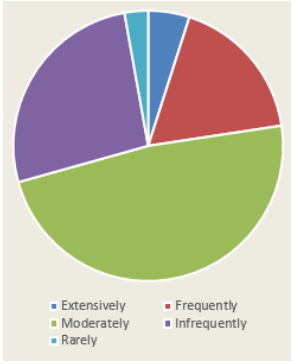


FIGURE 5: TYPES OF MOBILE DEVICES BY GRADE LEVEL

The respondents were asked to rate the usage of mobile devices on a 5-point scale ranging from "Extensively" to "Rarely." The definitions of those terms, as used in this study, can be found in Appendix B.

"Moderately" was the most cited response and the table shows something of a central clustering of responses around this value; that is, as one moves away from this item in either direction the frequency of responses diminishes. Overall it seems that very few of the respondents take to extremes, that is, few respondents use them rarely or all of the time.

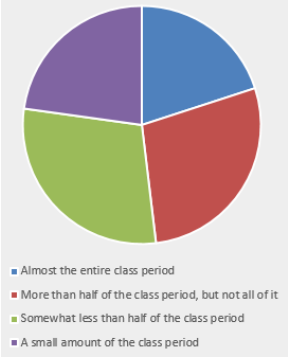


Which choice best describes the frequency with which mobile devices are used in the classes you teach?							
Answer Options	Exten-sively	Freq-uently	Mod-erately	Infreq-uently	Rarely	Rating Average	Response Count
	14	50	136	75	8	2.95	283
Answered question							283
Skipped question							94

TABLE 13: DEGREE OF USAGE OF MOBILE DEVICES

It is important to bear in mind that the 94 respondents who skipped this question did so because they indicated they do not use mobile devices.

The rating average was obtained by counting "Extensively" as 5, 'Frequently" as 4 and so on. The value of 2.95 therefore suggests "Moderately" as a typical value.



There was no clear pattern in the response to the question regarding the amount of time typically spent using mobile devices, as Table 14 shows. Notice that each of the four items received a relatively large fraction of the total, thus suggesting no great preference for any given scenario over another.

When you use mobile devices in class, which choice best describes the amount of time typically spent using them?		
Answer Options	Response Percentage	Response Count
Almost the entire class period	20.0%	57
More than half of the class period, but not all of it	28.1%	80
Somewhat less than half of the class period	29.1%	83
A small amount of the class period	22.8%	65
Answered question		285
Skipped question		92

TABLE 14: PORTION OF CLASS TIME DEVOTED TO MOBILE DEVICES

As Table 15 shows, the mobile devices are used by the respondents for a wide variety of purposes.

What are mobile devices used for in your class? Check all that apply.		
Answer Options	Response Percentage	Response Count
Using Microsoft / Apple Office Software	33.5%	95
Using Google Apps	49.3%	140
Watching videos	39.4%	112
Browsing the web	54.2%	154
Interacting with games, simulations, web 2.0 tools, etc.	57.4%	163
Using social media	3.5%	10
Using other content not already mentioned	25.4%	72
Answered question	284	
Skipped question	93	

TABLE 15: USES FOR MOBILE DEVICES

Of the 284 respondents, only 10 reported using social media on mobile devices in class. This would indicate that despite the prevalence of discussion in popular media and educational research, "Using social media" is not an area of focus for the sample group.

When the responses were broken down by grade level, several interesting trends became noticeable.

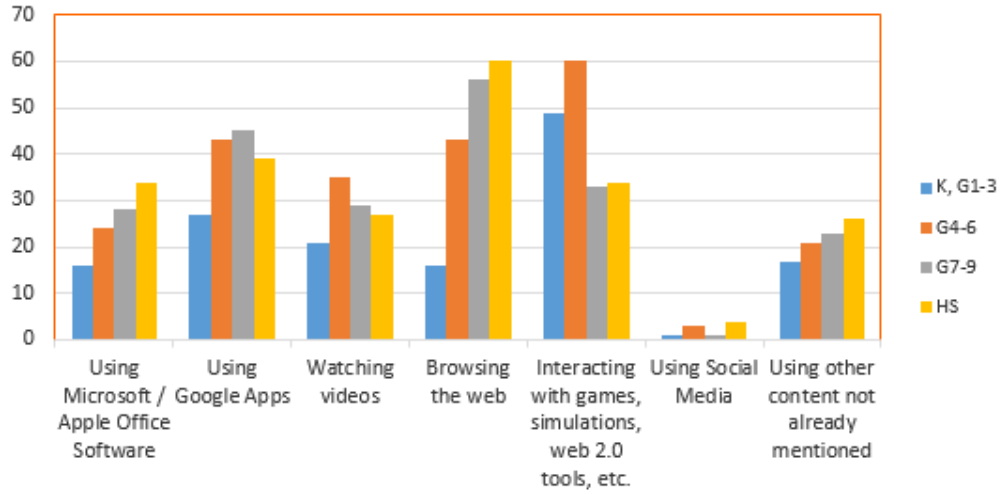


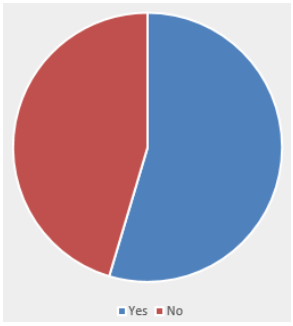
FIGURE 6: USES OF MOBILE DEVICES, BY GRADE LEVEL

Examine Figure 6. Consider, first of all, the results for "Using Microsoft / Apple Office Software." Notice that as the grade level increases so, too, does the frequency with which the sample reported use. The same applies to "Browsing the Web" and "Using other content not already mentioned." This indicates the potential for increased emphasis on using the equipment for reading and writing tasks with advancing grade levels.

Now consider "Interacting with games, simulations, web 2.0 tools etc." and notice that the reverse is true. That is, as the grade level advances the frequency with which the sample reported its use decreases, thus indicating a potential de-emphasis on games and simulations as teaching and learning tools with advancing grade level.

Computer Labs

The respondents were asked if they used a computer lab on a regular basis. Table 16, below, shows that slightly more than one-half of the respondents indicated that they did.



Do you use a computer lab on a regular basis?		
Answer Options	Response Percentage	Response Count
Yes	52.1%	189
No	43.3%	157
Not applicable. My school does not have a Computer Lab.	4.7%	17
Answered question		363
Skipped question		14

TABLE 16: USE OF A COMPUTER LAB

Only those who responded "yes" to the above question were asked a series of follow-up questions. Therefore, the discussion that follows only apply to the 52.1% of the sample who indicated that they use the lab.

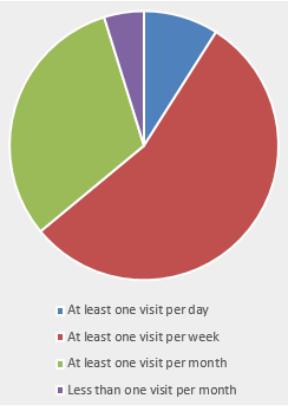


Table 17, below, indicates that the overall usage pattern ranges between one visit per week to one visit per month, with only 9% of respondents indicating that they visit the lab at least once per day.

How frequently do you use the computer lab?		
Answer Options	Response Percentage	Response Count
At least one visit per day	9.0%	17
At least one visit per week	55.0%	104
At least one visit per month	31.2%	59
Less than one visit per month	4.8%	9
Answered question		189
Skipped question		188

TABLE 17: FREQUENCY OF VISITS TO THE COMPUTER LAB

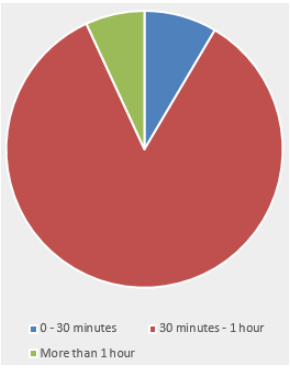


Table 18, below, indicates that the most frequently reported visit duration is between 30 minutes to one hour.

What is the duration of a typical visit to the computer lab?		
Answer Options	Response Percentage	Response Count
0 - 30 minutes	8.5%	16
30 minutes - 1 hour	84.6%	159
More than 1 hour	6.9%	13
Answered question		188
Skipped question		189

TABLE 18: DURATION OF VISIT TO THE COMPUTER LAB

The respondents were asked to check the types of activities done in the computer lab. Table 19 summarizes their responses.

What activity (or activities) do your students do when you visit the lab? Check all that apply.		
Answer Options	Response Percentage	Response Count
Use Microsoft / Apple Office Software	66.7%	126
Use Google Apps	38.1%	72
Watch videos	37.6%	71
Browse the web	66.1%	125
Interact with games, simulations, web 2.0 tools, etc.	50.8%	96
Use social media	3.2%	6
Use software that is only found on equipment in the lab	32.3%	61
Answered question		189
Skipped question		188

TABLE 19: ACTIVITIES DONE IN THE COMPUTER LAB

Notice, once again, the very small percentage of respondents who reported that they have their students use social media when in the computer lab.

When the results were broken down by grade level, patterns similar to those found in the use of mobile devices were also apparent.

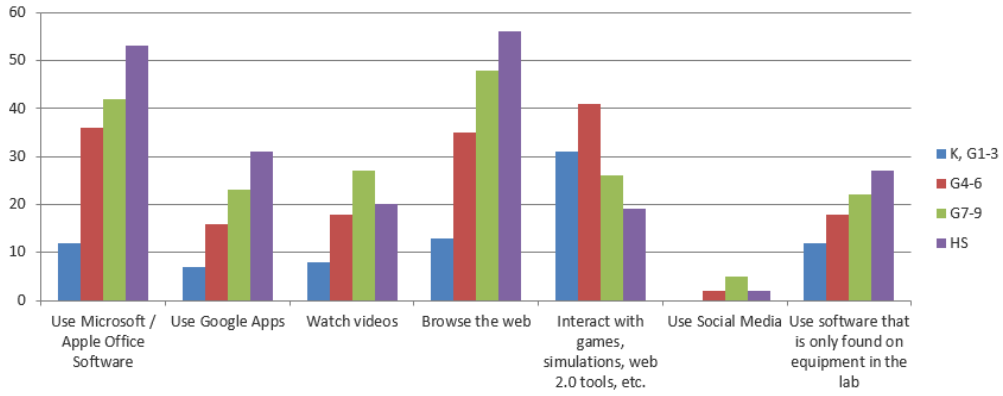
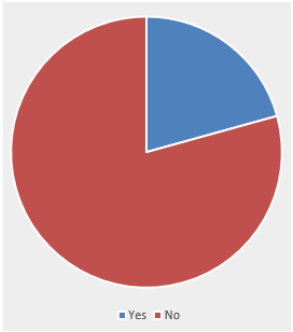


FIGURE 7: ACTIVITIES DONE IN THE COMPUTER LAB BY GRADE LEVEL

Notice, once again, two things as one advances in grade level. First, the rise in frequency of "Use Microsoft / Apple Office Software" "Browse the Web" and "Use software that is only found on equipment in the lab." Second, the decline in frequency of "Interact with games, simulations, web 2.0 tools, etc."

Social Media

The respondents were asked if they used social media. Table 20 shows that slightly less than 21% of the respondents indicated that they did. This figure is consistent with the low responses to the questions surrounding the use of social media on mobile devices and in the computer lab.



Do you use social media for educational purposes?		
Answer Options	Response Percentage	Response Count
Yes	20.7%	75
No	79.3%	288
Answered question		363
Skipped question		14

TABLE 20: USAGE RATE OF SOCIAL MEDIA

Only the teachers who responded "yes" to the above question were asked a series of follow-up questions. Therefore the next section reflects the views of only approximately 21% of the respondents since the rest indicated that they did not use social media.

The 75 respondents who indicated they made some use of social media were asked what they typically use it for. Table 21 shows the results.

Which choices reflect how you use social media? Check all that apply.		
Answer Options	Response Percentage	Response Count
I use social media to find useful articles and resources.	64.4%	47
I use social media to communicate with parents / guardians.	61.6%	45
My students also have social media accounts for education and we use social media in class.	21.9%	16
Other (please specify)	9.6%	7
Answered question		73
Skipped question		304

TABLE 21: TYPES OF USAGE FOR SOCIAL MEDIA

Notice that only 16 out of the 377 teachers in the sample indicated that they have their students use social media in the classroom.

The respondents were presented with a list of the more popular social media applications and asked to indicate the degree to which they use each one, on a scale that ranged from "Never" to "Extensively." The definitions of those terms, as used here, can be found in Appendix C. Table 22 presents the results.

Indicate the degree to which you use the following social media tools in class:							
Answer Options	Never	Rarely	Infreq-uently	Moder-ately	Freq-uently	Exten-sively	Response Count
Blinklist	58	0	0	0	0	0	58
Del.icio.us	56	2	1	1	0	0	60
Digg	56	0	0	0	0	0	56
Facebook	31	5	10	12	7	0	65
Flickr	51	3	2	1	0	0	57
Google+	26	2	8	10	12	6	64
Hi5	56	0	0	0	0	0	56
Instagram	54	3	0	1	0	0	58
Last.FM	58	0	0	0	0	1	59
Linkedin	50	3	4	1	1	0	59
Pinterest	28	6	11	12	8	4	69
Propeller	57	0	1	0	0	0	58
Reddit	55	1	2	1	1	0	60
Simpy	58	0	0	0	0	0	58
SnapChat	54	4	0	0	0	0	58
Tumblr	54	4	0	0	0	0	58
Twitter	25	7	6	9	11	6	64
Wikipedia	15	10	13	10	13	2	63
YouTube	4	2	10	14	32	9	71
Answered question							73
Skipped question							304

TABLE 22: USAGE OF SPECIFIC SOCIAL MEDIA TOOLS

For the majority of the tools, the respondents indicated that they never use them.

It is important to point out that the term "social media" is not clearly defined or understood. Therefore it is reasonable to assume that some respondents use tools like YouTube, Wikipedia and Pinterest but don't think of them as social media. By responding "no" to the initial social media question those respondents would not have had the opportunity to answer this question.

Specific Hardware and Software

The respondents were asked whether their students had access to WiFi. Table 23, below, shows the results.

Is school-based WiFi with internet capability available to students at your school?		
Answer Options	Response Percentage	Response Count
Yes	78.8%	267
No	21.2%	72
Answered question		339
Skipped question		38

TABLE 23: AVAILABILITY OF WIFI FOR STUDENTS

Almost 80% of the respondents indicated that the students had potential WiFi access.

The respondents were then asked whether the students were permitted to use WiFi access while in class. Table 24 shows the results.

Are students permitted to use their own devices (smart phones, tablets, Chromebooks and / or laptops) in your class?		
Answer Options	Response Percentage	Response Count
Yes, students may use their own devices in class any time they wish.	6.8%	23
Yes, but only for in-class activities that require their use.	60.1%	203
No, students are not permitted to use their own devices in class.	33.1%	112
Answered question	338	
Skipped question	39	

TABLE 24: IN-CLASS USE OF WIFI BY STUDENTS

Roughly 60% of the respondents indicated that students are permitted to use their own devices to access the internet when it is required for school-related work. 33% of the respondents' students are not permitted to use the internet in class at all, even though it is available. Slightly less than 7% of the students are free to do as they wish.

Some differences were observed when the data was broken down by grade level.

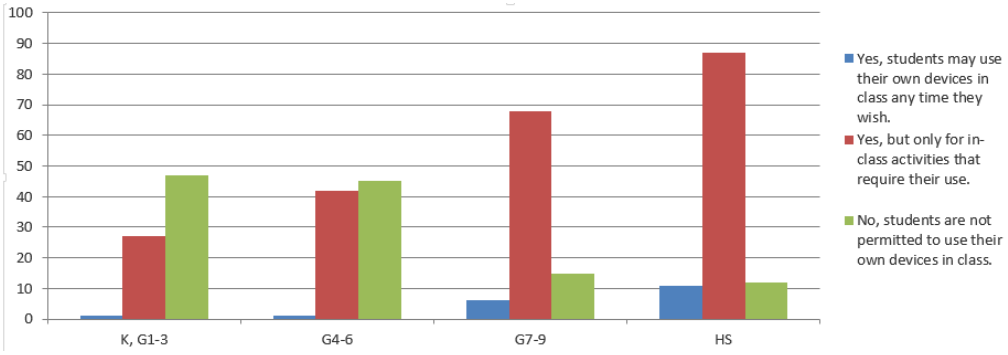


FIGURE 8: IN-CLASS USE OF WIFI BY STUDENTS BY GRADE LEVEL

Notice, in Figure 8, that situations in which students are not permitted to use their own devices are more prevalent for responders in K-6 classrooms. Notice, also, the steady increase in instances in which WiFi access is permitted when it is deemed appropriate, as the grade level increases.

The respondents were asked, "If your students use computers (desktops or laptops) in your classroom or the lab, what are the three most commonly used PC / Mac software applications?" Overall, 476 items were suggested. Only those items that were suggested five times or more were recorded for presentation here. Table 25 shows the results, sorted in terms of frequency.

Application	Frequency
Microsoft Word	92
Web Browser	62
Powerpoint	49
Google Apps for Education	38
Microsoft Office	28
Web search	22
YouTube	10
iPad	8
Dream Box	6
Word Q	6
RAZ Kids	5
Word Processing	5

TABLE 25: MOST USED COMPUTER SOFTWARE APPLICATIONS

Microsoft Word was the most frequently suggested item. When combined with Google Apps for Education and Microsoft Office it can be seen that, for the sample, having software that enables the writing of documents and preparation of presentations is important. The existence of a web browser is also important.

The respondents were asked, "If your students use mobile devices (tablets, smartphones, Chromebooks, etc.) in your classroom, what are three most commonly used apps?" Overall, 428 items were suggested. Only those items that were suggested five times or more were recorded for presentation here. Table 26 shows the results.

Application	Frequency
Google Apps for Education	50
Web Browser	38
YouTube	17
Web Search	15
Raz-Kids	14
DreamBox	10
Graphing Calculator	8
iMovie	7
PicCollage	7
Dragon Applications	6
Epic Books	6
Microsoft Office	6
NearPod	6
Starfall	6
Socrative	5
WordQ	5

TABLE 26: MOST USED MOBILE APPS

The respondents were given a list of specialized devices and were asked to rate their usage of each one on a six-point scale ranging from "Never" to "Extensively." Table 27 gives the results.

Indicate the degree to which you and your students use the following devices:							
Answer Options	Never	Rarely	Infrequently	Moderately	Frequently	Extensively	Response Count
3D Printer	308	9	3	4	6	1	331
Clicker - any brand	278	30	12	4	1	0	325
Computer Numerical Control (CNC) Equipment	311	7	6	2	2	1	329
Standalone DVD Player	251	39	24	9	6	2	331
eReader	255	25	23	12	10	1	326
Graphing Calculator	254	17	20	14	12	10	327
Laboratory Interfacing Equipment	290	14	11	10	2	1	328
Robotics Kit	305	9	7	6	0	1	328
Sensing and Control Equipment	303	13	8	5	0	0	329
Answered question							333
Skipped question							44

TABLE 27: FREQUENCY OF USAGE OF SELECTED DEVICES

In every instance the most frequently reported response was "Never."

The respondents were given a list of web-based applications and were asked to rate their usage of each one on a six-point scale ranging from "Never" to "Extensively." Table 36, below, gives the results. The average response was calculated by counting "Never" as 0, "Rarely" as 2 and so on, and then computing an overall value.

Indicate the degree to which you and your students use the following web-based applications:								
Answer Options	Never	Rarely	Infreq-uently	Freq-uently	Moder-ately	Extens-ively	Rating Aver-age	Response Count
YouTube	15	22	56	98	99	35	2.64	325
Google Maps / Earth	101	65	72	23	59	4	1.60	324
Prezi	196	38	41	11	30	2	0.86	318
GoNoodle	239	9	14	16	19	7	0.55	304
Quizlet	257	19	14	7	16	1	0.42	314
Kidblog	262	11	15	8	9	6	0.34	311
Edmodo	265	20	17	4	9	1	0.33	316
Glogster	268	16	17	1	10	2	0.3	314
Moodle	269	17	9	3	12	2	0.3	312
Blogger	274	19	8	6	3	0	0.21	310
Wordpress	280	11	8	5	5	2	0.21	311
Animoto	286	8	6	2	9	0	0.2	311
Socrative	272	17	13	4	1	1	0.19	308
Kahoot	285	4	5	1	9	1	0.18	305
Desmos	288	4	7	2	6	2	0.16	309
Phet	286	5	3	6	2	1	0.13	303
Schoology	289	5	6	3	0	5	0.1	308
Edublogs	294	7	5	0	2	1	0.08	309
Powtoon	299	4	2	1	1	0	0.05	307
Scratch	300	5	1	0	2	0	0.05	308
FreeMind	298	5	3	0	0	0	0.04	306
Mind Meister	301	4	4	0	0	0	0.04	309
Emaze	297	3	3	0	0	0	0.03	303
Answered question								333
Skipped question								44

TABLE 28: FREQUENCY OF USAGE OF SELECTED WEB-BASED APPLICATIONS

Overall, YouTube at 2.64 (suggesting usage between infrequently and frequently) and Google Maps / Earth, at 1.60 (suggesting usage between rarely and infrequently) received the highest overall ranking.

When sorted by grade level, GoNoodle, which is only suited for use by primary school students, managed an overall average of 0.55 (suggesting usage between rarely and infrequently) was the next best.

The respondents were given a list of computer-based applications and were asked to rate their usage of each one on a six-point scale ranging from "Never" to "Extensively." Table 29 gives the results. As before, the rating average was obtained by counting "Never" as 0, "Rarely" as 1 and so on and then computing an overall average.

Indicate the degree to which you and your students use the following computer-based applications:								
Answer Options	Never	Rare-ly	Infreq-uently	Freq-uently	Moder-ately	Extensiv-ely	Rating Average	Response Count
Apple Productivity Suite	277	20	7	1	7	2	0.24	314
Audacity	247	26	23	5	15	0	0.47	316
Autocad	291	8	10	1	3	0	0.14	313
ExamView / ExamView Pro	250	17	15	12	12	7	0.53	313
Inspiration	272	14	17	3	4	0	0.24	310
Kidspiration	241	26	23	5	21	1	0.56	317
Master Cam	293	7	5	1	1	2	0.11	309
Microsoft Office	37	11	21	102	66	90	3.28	327
Minecraft	239	18	22	6	22	2	0.58	309
Sketchup	287	11	6	4	4	2	0.19	314
Skype	243	30	24	4	10	2	0.45	313
Skype for Business	263	15	17	6	10	3	0.39	314
Solid Works	296	7	3	0	4	2	0.13	312
Other (please specify)								13
Answered question								330
Skipped question								47

TABLE 29: FREQUENCY OF USAGE OF SELECTED COMPUTER-BASED APPLICATIONS

As before, for all items except Microsoft Office, the most frequently reported result was "Never."

The highest reported ranking, at 3.28 (suggesting usage between infrequently and frequently) was for Microsoft Office. This result is consistent with the results of Tables 33 and 34.

Only three additional applications showed any measurable use when the results were sorted by grade level. Kidspiration and Minecraft received an overall of 1.9 and 1.8 respectively in Grades 4-6, which indicated rare usage for the sample group. Examview Pro received a ranking of 1.9 in Grades 7-9 and 2.0 Grades 10-12, which also indicated rare usage for the sample group.

The respondents were asked, "If you could name one piece of educational technology that you deem as essential specifically what would you choose?" Overall, 268 responses were given. The results were grouped and the ones that appeared more than five times are shown in Table 30 below.

Item	Frequency
Interactive Whiteboard	91
iPads	53
Desktop PCs	26
Google Apps for Education	17
Internet Access	7

TABLE 30: FREQUENCY OF THE POPULAR ITEMS CHOSEN AS "THE ONE ESSENTIAL ITEM" BY RESPONDENTS

The Interactive Whiteboard was the most frequently reported item.

The respondents were asked, "Are there any educational technologies currently used by you that have not been already addressed in this survey? If this is the case, please briefly list and describe how you use them."

Answers were provided by 37 respondents. These were grouped and are presented verbatim in Appendix D.

Table 31 lists the frequency of each response by type.

Response Type	Frequency
Air server	2
Apple TV	6
GAFE	4
iPad Apps	5
Other hardware	20

TABLE 31: RESPONDENT-PROVIDED ITEMS DEEMED IMPORTANT THAT WERE NOT INCLUDED IN THE SURVEY

The last item invited respondents to add their own comments and 44 respondents completed this item. The results were grouped and classified and Table 32 tallies how many of each type of comment was recorded. The results are presented verbatim in Appendix E.

Type	Frequency
General Comment	7
Interactive Whiteboard	10
Mobile devices	10
Primary	3
Special Education	2
Training / Support	11

TABLE 32: CLASSIFICATION OF RESPONDENTS' COMMENTS

Summary and Conclusion

This study was designed to obtain information on the prevalence of electronic technology—in terms of availability and use—in classrooms in Newfoundland and Labrador. An online survey was developed and delivered to a random sample of 800 educators. 377 of them (47%) completed it.

Interactive Whiteboards

Of the respondents, 94% have access to an Interactive Whiteboard and 72% of the respondents use the Interactive Whiteboard on a regular basis. Most of those indicated that it gets frequent use.

The data showed a pattern of declining interactive usage as grade level increases. That is, it appears that for the teachers with younger students *interaction* was more important and that for teachers in intermediate and high school, Whiteboards were used more as a large non-interactive display.

The amount of class time devoted to the usage of the Interactive Whiteboards showed a high degree of variability. The largest portion of the respondents chose either slightly more or slightly less than half of the period as opposed to either a small amount or all of the class period.

Clearly, the Interactive Whiteboard is an integral part of the current landscape and, so, the TLC shall continue to place a focus on ensuring that pre-service teachers are familiar with their usage. In particular, the primary / elementary, as well as the intermediate / secondary groups, need to be aware of how to create and use interactive lessons with the whiteboard.

Tablets and other Mobile Devices

Approximately 79% of the respondents indicated that they make use of mobile devices. Shared class sets was the most common reported configuration, with 70.9% of the respondents indicating this was the case for them.

77% of the respondents indicated that the equipment consisted of a set of iPads. The use of BYOD was also noted in the results, however this was something more prevalent in the higher grades.

The survey data indicated that the mobile devices were used several times per month, however there was no clear pattern in the amount of class time that was devoted to them when they were used.

The respondents did not indicate a preference for any one application but, rather, indicated that many of the suggested applications were used. Very few of the respondents indicated that the mobile devices were used in class for social media. It was observed that with increasing grade levels (a) the use of simulations and games decreased and (b) the use of Office (that is, Microsoft Office, Google Apps, or equivalent) applications increased.

The data supports the TLC's ongoing effort to obtain and integrate a class set of iPads available for loan to help enable prospective teachers to become familiar with their use in the educational setting. As no clear pattern of usage was identified, further research is warranted to help shed light on what applications and specific affordances of the device (wireless projection, collaboration, etc.) might provide some innovation for teaching and pedagogy.

Computer Labs

Slightly more than one-half (52%) of the respondents indicated that they make use of a computer lab. Of those that use the labs, the most widely reported usage pattern, at 55%, was at least once per week. Typical visits were between 30 minutes and one hour.

As was the case with mobile devices, the respondents did not indicate a preference for any one application over others but, rather, indicated that the computers were used for a variety of purposes. Application usage reflected that of mobile devices. A pattern of decreased use of games and simulations and a corresponding increase in use of Office applications as grade level increased was again observed.

With a decreasing emphasis on full computer labs in NL schools, the trend towards mobile devices and collaborative learning spaces indicates that there is no pressing need for the Faculty to consider re-instating a full-scale computer lab. Instead, modest increases to the number of Labnet computers in the Education Library and Commons will satisfy the needs of students requiring access to specific software and printing.

Social Media

Approximately one-fifth of the sample (20.7%, or 75 individuals) indicated that they used social media. Those that did use it indicated that they used it to find information and to communicate with parents. Only 16 respondents stated that they let students use social media for class purposes.

Given the current low rate of usage, further research is required to determine if this trend will continue. In light of the high rate of social media use amongst Faculty of Education students, an exploration of this dichotomy might be worthwhile.

Specific Hardware and Software

Almost four-fifths (78.8%) of the respondents stated that their students, technically, had access to in-school WiFi. Most (60.1%) indicated that students were permitted to use it only when it was in support of classroom activities.

When asked what computer-based applications were used most often, Office type applications were the most popular. There was also indication that general browsing and searching was also popular. A similar result was obtained when the respondents were asked what mobile applications were most commonly used.

Specific hardware and software, such as 3D printers and clickers, were not reported to be in widespread use.

The respondents were presented with a list of 23 web-based educational applications. None of these were found to be in widespread use, although a variety of them were found to be used by some of the participants.

A similar response was found when the participants were presented with a list of computer based applications. The one major exception was Microsoft Office which did appear to be in widespread use.

When asked to name the one essential piece of technology, in order of frequency from lowest to highest, the respondents suggested: Interactive Whiteboards, iPads, Desktop PCs, Google Apps for Education and Internet Access.

Regarding new and emerging technologies, the study yielded no surprises. That is, the technologies noted as essential in the free-form responses were, for the most part, the ones included in the study and already generally well-known.

Overall, this points to a situation in which few, if any, universally useful applications exist, other than the aforementioned Office applications. This, in turn, seems to indicate that it may be best to investigate hardware and software in an effort to match the best tool to the desired curricular outcomes. Also, providing students with options to explore mobile device apps and web tools with just-in-time assistance to assess the appropriateness and usability of the tools.

The issue of how generalizable the results are to the population is one that requires thoughtful consideration. Using the sample size calculator that is supplied with Survey Monkey, results that can be considered accurate to +/- 5% at the 95% confidence interval can be obtained from 359 respondents. Given that 377 responses were obtained, this condition appears to be met.

However, because that the 377 responses were not drawn from the general population but, rather, from a random sample of 800, the possibility of bias remains and any extrapolations from the sample to the population at large should be made with caution.

Overall

This study was intended to help inform the TLC's future plans and, in this regard, several conclusions can be made from the available data.

The lack of reported emphasis on the use of computer labs and on the usage of social media casts doubt on the value of re-establishing computer labs for student usage, rather, continued focus on meeting already-expressed needs such as printing and scanning capability would be more pragmatic. At the same time, the growing usage of tablets and mobile applications suggests that emphasis in these areas is a good idea.

Two hardware platforms in particular, SMART Boards and iPads, receive significant usage in the province's schools. It makes sense, therefore, to continue supporting the use of SMART technologies wherever possible. The TLC will continue to maintain the two installed units, and to encourage Education students to explore their usage to ensure that they are familiar with the use of the boards, from both a technical and pedagogical point of view.

Similarly, it makes sense to proceed with the establishment of a class set of iPads, available for loan, and to investigate how these can be integrated within the Faculty of Education's various teacher education programs.

Because the data yielded no clear indication of preferred software, of online services or of social media in widespread active usage, no further software acquisitions are deemed necessary at this time.

Further Research

The data for this study was obtained from a questionnaire administered to a randomly chosen sample of teachers in the province's English School District. At the time, this was seen as the most cost-efficient method. As previously acknowledged, though, self-reported data brings with it the possibility of bias, so generalizations to the population should be made with caution. There is value in obtaining similar data through other means and then comparing the results across the studies. With this in mind it makes sense to consider a similar study but, instead of using current teachers, to rely on the reported observations of student teachers returning from their internships in 2018.

Several additional research questions emerged from this study including:

- Specifically how are the various hardware platforms, in particular SMART Boards and iPads, being used in class settings?
- Does the current use of electronic technology have a positive effect on learning outcomes?
- What supports, in terms of ongoing training and guidance, are required to maximize the benefit of the technologies in current use?

Appendix A: Survey Questions

Welcome to the Survey

This survey is designed to collect data around the use of various electronic software and hardware tools in our provincial K-12 educational system so that MUN's Education Library and Teaching & Learning Commons can better support our pre-service teachers.

The results of the survey will be shared with the province's school districts. This survey should take about 10 minutes of your time.

Please Note: At several points during the survey you will be asked to rank, using a Likert scale, the frequency with which various tools are used, on a range between "Never" and "Extensively." It is acknowledged that the many complexities associated with classrooms make it difficult to provide an exact definition for the terms involved, but the following can be used as a guideline:

- Never means exactly that.
- Rarely means that use of the item would be viewed as a special occasion—typically less than once or twice for the whole year.
- Infrequently means that the item would be used less than once per month. Typically this means it is used for a single purpose that happens a few times per year.
- Moderately means that the item would be used more than once per month, but not on a weekly basis.
- Frequently means that the item would be used at least once per week.
- Extensively means that the item is used almost every day.

Thank you for participating in our survey. Your feedback is important.

Respondent Information 1

Which choice best describes your location?

- NLESD Labrador Region
- NLESD Western Region
- NLESD Central Region
- NLESD Eastern Region
- CsfbTNL
- Other (please specify)

What is your gender?

Including this year, how many years classroom experience do you have? Count your service thus far this year as a half-year, years you were employed half-time as a half-year and so on.

Which choice or combination of choices describes your position? Check all that apply.

- Classroom teacher, primary (K, G1-3)
- Classroom teacher, elementary (G4-6)
- Classroom teacher, intermediate (G7-9)
- Classroom teacher, High School
- Special education teacher
- Guidance Counsellor
- Itinerant
- Vice Principal

- Principal
- District Office Personnel Other (please specify)

Respondent Information 2 (ONLY FOR Intermediate and HS Teachers)

You have indicated that at least some of your teaching duties are at the Intermediate / Secondary level. For that portion of your job, in which subject areas do you teach. Check all that apply.

- Choices were: Art, Career Education, Core French, Economic Education, English Language Arts, English as a Second Language, Family Studies, Français, Guidance, Health, Home Economics, Literacy Enrichment and Academic Readiness for Newcomers (LEARN), Mathematics, Music, Physical Education, Religious Education, Science, Skilled Trades, Social Studies, Technology Education, and Other (please specify).

Learning about Educational Technology (see NOTE below)

Which choice best describes your degree of comfort with the use of educational technology?

- Very comfortable
- Somewhat comfortable
- Neither comfortable nor uncomfortable Somewhat uncomfortable
- Very uncomfortable

Where do you learn about the use of educational technology? Order from most important (1) to least important (4)

- Self-directed learning
- Informally, from colleagues
- Formally, from courses I take online and / or face to face
- Formally, from District / Department of Education / NLTA sponsored in-service sessions

NOTE: due to an error in logic on the online survey this item was skipped by many participants. It was decided not to discuss the results as a result.

Interactive Whiteboards 1

Does the classroom you use most often have an Interactive Whiteboard? If it has more than one check all that apply.

- It has a SMART board
- It has a Teamboard
- It has an Activ Board
- It has a Mimeo Board
- It has a non-interactive display (a projector and screen, for example)
- It has no available large screen display capability
- Other (please specify)

Do you use an Interactive Whiteboard on a regular basis?

- Yes / No

Interactive Whiteboards 2

Which best reflects your usage of the Interactive Whiteboard?

- Primarily for displaying non-interactive content such as presentation slides, videos, images, etc.
- Primarily to enable students to interact with interactive content such as games, simulations, etc.
- Both for interactive and non-interactive content

Which best describes the frequency with which the Interactive Whiteboard is used in your classes?

- Extensively, Frequently, Moderately, Infrequently, Rarely

How much class time do you spend using the Interactive Whiteboard?

- Almost the entire class period.
- More than half of the class period, but not all of it
- Somewhat less than half of the class period.
- A small amount of the class period

Rank your usage of the Interactive Whiteboard from greatest (1) to least (5)

- Displaying presentations (e.g. PowerPoint, Google Slides, Prezi, etc.)
- Interacting with content created for the Interactive Whiteboard (using SMART Notebook, etc.)
- Displaying video
- Displaying content from the web
- Interacting with content from the web (games, simulations, web 2.0 tools, etc.)

Tablets and other Portable Devices 1

Do you make use of mobile devices (Tablets, iPods, smart phones and / or Chromebooks) in your classroom?

- Yes / No

Tablets and Other Portable Devices 2

Regarding mobile devices, which choice best describes your situation?

- Your own class set
- A shared set, available for loan
- BYOD (Bring Your Own Device) -- I mainly rely on student-supplied devices

Regarding mobile devices, which choice best describes your situation?

- Primarily (more than 75%) iPads
- Primarily (more than 75%) Android tablets primarily (more than 75%) Chromebooks
- A mix of several types, with no one type being dominant.
- Other (please specify)

Which choice best describes the frequency with which Mobile devices are used in the classes you teach?

- Extensively, Frequently, Moderately, Infrequently, Rarely

When you use mobile devices in class, which choice best describes the amount of time typically spent using them?

- Almost the entire class period
- More than half of the class period, but not all of it
- Somewhat less than half of the class period
- A small amount of the class period

What are mobile devices used for in your class? Check all that apply.

- Using Microsoft / Apple Office Software
- Using Google Apps
- Watching videos
- Browsing the web

- Interacting with games, simulations, web 2.0 tools, etc.
- Using social media
- Using other content not already mentioned

Computer Lab 1

Do you use a computer lab on a regular basis?

- Yes / No
- Not applicable. My school does not have a computer lab.

Computer Lab 2

How frequently do you use the computer lab?

- At least one visit per day
- At least one visit per week
- At least one visit per month
- Less than one visit per month

What is the duration of a typical visit to the computer lab?

- 0 - 30 minutes
- 30 minutes - 1 hour
- More than 1 hour

What activity (or activities) do your students do when you visit the lab? Check all that apply.

- Use Microsoft / Apple Office Software
- Use Google Apps
- Watch videos
- Browse the web
- Interact with games, simulations, web 2.0 tools, etc.
- Use social media
- Use software that is only found on equipment in the lab

Social Media 1

Do you use social media for educational purposes?

- Yes / No

Social Media 2

Which choices reflect how you use social media? Check all that apply.

- I use social media to find useful articles and resources.
- I use social media to communicate with parents / guardians.
- My students also have social media accounts for education and we use social media in class.
- Other (please specify)

Indicate the degree to which you use the following social media tools in class.

- Never, Rarely, Infrequently, Moderately, Frequently, Extensively
- Items were: Blinklist, Del.icio.us, Digg Facebook, Flickr Google+, Hi5, Instagram, Last.FM, Linkedin, Pinterest, Propeller, Reddit, Simpy, SnapChat, Tumblr, Twitter, Wikipedia, YouTube

Use of Specific Hardware and Software

Is school-based WiFi with internet capability available to students at your school?

- Yes / No

Are students permitted to use their own devices (smart phones, tablets, Chromebooks and / or laptops) in your class?

- Yes, students may use their own devices in class any time they wish.
- Yes, but only for in-class activities that require their use.
- No, students are not permitted to use their own devices in class.

If your students use computers (desktops or laptops) in your classroom or the lab, what are the three most commonly used PC / Mac software applications?

- Choice 1 (free response), Choice 2 (free response), Choice 3 (free response)

If your students use mobile devices (tablets, smartphones, Chromebooks etc.) in your classroom, what are three most commonly used apps?

- Choice 1 (free response), Choice 2 (free response), Choice 3 (free response)

Indicate the degree to which you and your students use the following devices.

- Never, Rarely, Infrequently, Moderately, Frequently, Extensively
- Choices were: Clicker - any brand, Standalone DVD Player, Graphing Calculator, Robotics Kit

Indicate the degree to which you and your students use the following web-based applications.

- Never, Rarely, Infrequently, Moderately, Frequently, Extensively
- Choices were: Blogger, Edmodo, Emaze, Glogster, Google Maps / Earth, Kidblog, Moodle, Phet, Quizlet, Scratch, Wordpress

Indicate the degree to which you and your students use the following computer-based applications.

- Never, Rarely, Infrequently, Moderately, Frequently, Extensively
- Choices were: Audacity, ExamView / ExamView Pro, Kidspiration, Microsoft Office, Sketchup, Skype for Business, Other (please specify)

If you could name one piece of educational technology that you deem as essential specifically what would you choose?

- (free response)

Are there any educational technologies currently used by you that have not been already addressed in this survey? If this is the case, please briefly list and describe how you use them.

- (free response)

If you have any additional comments, please write them in the space below.

- (free response)

Thank you for taking the time to complete this survey. Your input is very much appreciated.

Appendix B: Miscellaneous Data Tables

	Sample	As % of total	Population	As % of total	Expected
Male	96	26.59%	1493	27.41%	99
Female	265	73.41%	3954	72.59%	262
Total	361		5447		
			Chi-square p-value		0.723398

TABLE 33: BREAKDOWN BY GENDER

	Sample		Population		
	Frequency	As % of total	Frequency	As % of total	Expected
<1	4	1.07%	251	4.67%	17
1-4.9	28	7.47%	584	10.86%	41
5-9.9	77	20.53%	984	18.29%	69
10-14.9	61	16.27%	880	16.36%	61
15-19.9	63	16.80%	968	18.00%	67
20-24.9	73	19.47%	909	16.90%	63
25-25.9	57	15.20%	666	12.38%	46
30+	12	3.20%	137	2.55%	10
Total	375		5379		
			Chi-square p-value		0.00590

TABLE 34: BREAKDOWN BY YEARS OF SERVICE

	Sample		Population		
Region	Frequency	As % of total	Frequency	As % of total	Expected
Eastern	213	56.80%	3135	58.85%	221
Central	69	18.40%	972	18.25%	68
Western	66	17.60%	952	17.87%	67
Labrador	27	7.20%	268	5.03%	19
Total	375		5327		
			Chi-square p-value		0.29723

TABLE 35: SAMPLE BREAKDOWN BY DISTRICT REGION

Appendix C: Definition of Terms used in Likert scale questions

The questions used a 5-point scale ranging from "Rarely" to "Extensively" or a 6-point scale ranging from "Never" to "Extensively." The terms were defined as follows:

- *Never* means exactly that.
- *Rarely* means that use of the item would be viewed as a special occasion—typically less than once or twice for the whole year.
- *Infrequently* means that the item would be used less than once per month. Typically this means it is used for a single purpose that happens a few times per year.
- *Moderately* means that the item would be used more than once per month, but not on a weekly basis.
- *Frequently* means that the item would be used at least once per week.
- *Extensively* means that the item is used almost every day.

Appendix D: Respondent-provided items they deemed important that were not included in the survey.

Item	Comment
Air Server	Air Server is great for sharing apps on SMART / Team board
Air Server	Air Server to display content from an iPad to the SMART board using the WiFi connection
Apple TV	Apple TV
Apple TV	Apple TV - recently installed but not yet used
Apple TV	Apple TV
Apple TV	Apple TV, to project my iPad into the SMART board allow the whole class to see what I want them to do on the iPad and for one student to interact but others still see
Apple TV	I use an Apple TV to broadcast Doceri through my iPad to the SMART Board.
Apple TV	We are in the process of getting Apple TV in our school, not sure how this will be used at the moment.
GAFE	Google classroom
GAFE	Google classroom
GAFE	I use Google Drive extensively in my classroom environment and have for the past 6 years. It is my primary method for assignment and teaching. It is used for collaboration and feedback. Students submit over 120 documents per class per year using this method.
GAFE	My class uses Google Classroom. We entered a competition sponsored by Staples and are hoping to win $25,000. We plan to buy laptops for the class and to have a paperless classroom.
iPad apps	I use many apps on the iPad with my students. I use the site symbaloo (similar to de.lici.ous).
iPad apps	iMovie, Green Screen, Garage Band
iPad apps	iPad app Nearpod. I use it for teaching new concepts, reviewing material, as well as for both formative and summative evaluation.
iPad apps	iPad-to make own videos
iPad apps	For nonverbal students, the iPad with Proloquo2go software allows them a means to communicate. For students with ASD, there are many educational apps that give them access to education in a visual way, along with a way to show their learning. Many are resistant to paper/ pencil tasks.
Other hardware	Calculator
Other hardware	Cell phone and iPad used to correct multiple choice questions
Other hardware	Mp3 players are used for students who qualify for reading of text accommodations as they are currently the only resources available to us.
Other hardware	Sculptris and MakerBot – 3D printing, mind42.com - creating mind maps, Green Screen by Doink - Creating videos (Poverty project in Social Studies)
Other hardware	Video camera: student created videos based on outcomes, Camera: photos for student-directed newsletter
Other hardware	Wacom tablet for interactivity as Teamboard touch sensitivity does not work.
Other software	Avogadro which is a 3D molecule-rendering program, free to download by anyone
Other software	BrainPOP - educational videos
Other software	DreamBox
Other software	Everypoll, Plickers for formative assessment & analytics of student responses
Other software	FreeCad: Junior High Tech courses
Other software	KnowledgeHook - quiz with pictures of students work, Phet - interactive software
Other software	Kurzweil & Dragon NaturallySpeaking are both important software options for students with SLD with deficits in reading and writing. Post-secondary requires students to use these programs independently so they should be also used in the high school.
Other software	Music writing software- writing music for my bands

Other software	OpenSim....use it to teach design and basic coding
Other software	QR Scan - Create a game where you scan the paper for a clue and where to go for your next clue. Each one involves a student answering a question related to the curriculum.
Other software	Quick Key
Other software	Quick Key - scan with phone multiple choice bubble sheets, instant grading and item analysis.
Other software	We use Videolicious, Phonto, Educreations, Doc Scan, SimDif, Google Docs, Stack the Countries, WordReferences, VoiceThread
Other software	Weebly

Appendix E: Respondents' Final Comments

Type	Comment
General	Good teaching does not require any use of technology.
General	I am of the opinion that my students are over stimulated at most points in their day. It is my goal to encourage their "single-tasking" as opposed to "multi-tasking."
General	There are some apps I would love to use, but my school does not allow students to use the WiFi on their own devices. This excludes me from using technology in the gymnasium for PE class :(
General	Different learning techniques will always require different tools. The computer and what it is used for as an access to info, images and communication will always be there, but the computer is not an option for every learning event.
General	There are many computer and web-based applications that I have never heard of before!
General	I love to integrate technology into my classroom as often as I can. My students love technology-based activities. However, we often do not have the resources we need at our fingertips. I also feel that if there was a list of apps/resources that directly correlate to the curriculum objectives, teachers would more readily use educational technologies.
General	I am 100% principal. I am answering questions based on my own experiences and what I feel is used in my school.
IWB	I have used a SMART Board before and prefer using it and its technology. I find the technology with Team Boards less user friendly.
IWB	Would just like to make the comment that I find the SMART Boards to be much better than the Team Boards (more user-friendly and seem to function better). Would also like to mention that I have used more technology programs such as Kidblog when teaching in the higher grades.
IWB	I would probably use the SMART Board if I had the overhead arm for the monitor. I have a special needs student in my classroom and there is a risk of them tripping up in all the cords. Also our school has no tech support. It is unbelievable that a school has no one to look after computers in today's world. There should be a person hired in each school just for the tech.
IWB	An inservice that highlights how to incorporate the use of the Interactive Whiteboard into lesson planning would be welcome.
IWB	I need an Interative Whiteboard.
IWB	Regarding SMART Boards and using interactive programs, at our school we installed SMART boards and did a lot of PD and created lessons and materials. Then the school or school board decided to remove most of the SMART Boards and replace them with Team Boards. The materials that were created for the SMART Boards are not entirely compatible and it's frustrating to try to adapt. Especially when you teach in several different classrooms and the same technology is not available in each classroom.
IWB	I have a Team Board that hasn't worked in three years and will not be fixed. Its fine to have technology when it works so I rarely rely on it for instruction
IWB	I started with a SMART Board and loved it! I had collected resources to cover outcomes in many subject areas and even began creating my own. Then it was replaced with a Team Board and I never did get comfortable with it. Resources were also more difficult to find. It is no longer interactive and I'm told that it can't be fixed. In a primary classroom, coming to the computer and using the mouse instead takes some of the fun out of learning and it is not as efficient either.
IWB	My SMART Board hasn't worked in about a month. Still waiting for someone to come fix it. I normally use it often and every single day.
IWB	Interactive Whiteboards are starting to fail at our school and they are very expensive to replace. It is important to keep in mind that technology continues to evolve and what we have right now is already obsolete.
Mobile devices	Currently our school is pushing the use of Chromebooks. So far, from what I have seen, the program looks great. The problem is we only have one set for one class to use at a time. More resources must be given to schools if we are expected to use more technology in our classrooms.

Mobile devices	Laptops that can be easily accessed to create on would be better than the current tablet craze that exists today. Tablets are fine for viewing and interacting but, for creating, laptops would be better.
Mobile devices	BYOD is unmanagable and leaves students highly distracted and unsupervised in cyberspace. I have significantly reduced my level of technology in the classroom due to these concerns.
Mobile devices	We have a set of iPads, but they often have problems as we share a set of 30 or so in a school of 350 students. My students use Khan Academy to learn math at home. Also, every student in my class is studying Java Script on Khan Academy. Several of my students have finished the first course and the second course and are now doing an intro course to HTML. I expect all my students to at least finish the basic Java Script course offered by Khan. You would be surprised at how many of the students have fallen in love with coding.
Mobile devices	It is absolute bullcrap the way iPads are deployed in our school.
Mobile devices	I teach Kindergarten, so I use iPads on a regular basis as a center activity. We have many apps on them that the children are familiar with and can use for learning. I also use them for stories/ read alouds. I do not have a class set, but I have five iPads to use daily in my centers.
Mobile devices	I have tried the classroom sets of iPads and they are beyond frustrating due to restrictions and app installs. I also found that the social media educational platforms were more labour intensive and yielded an insufficient amount of fruit to justify their continued existence.
Mobile devices	I would like to use more tech. It's difficult when you have to share the iPads. Having access to your own set would allow you to use them effectively. Some schools I sub in allow WiFi while others do not. It's very inconsistent. Teachers don't bother with tech in lower grades other than reading and math aps.
Mobile devices	BYOD is too difficult given the lack of moral development for the users.
Mobile devices	BYOD is the appropriate way to go. Schools just need to provide the connectivity
Primary	We are blocked from social media in our school. As a primary school, I feel our needs and wants are not met when it comes to iPads, updated technology, etc. This survey seems more upper elementary / high school.
Primary	It is important to note that I am teaching in a primary grade and much of what you have mentioned in this survey is not permitted in a primary setting.
Primary	Due to the age of my students, my use of some technologies is limited, i.e. social media
Special Education	I am a special-services teacher so some of the questions do not apply to me where I do not have an entire class.
Special Education	It would be great if rooms used for special needs students could be equipped with reliable WiFi service, Interactive Whiteboards, iPads or computer hubs. I bring my own laptop and two iPads from home with me every day to use with my students.
Training / Support	I would like more training on and use of educational technology.
Training / Support	Poor WIFI connectivity impedes A LOT of tech use in my class.
Training / Support	While I enjoy using technology in the classroom I find there is not enough time to search out newer software and online applications.
Training / Support	A lot of technology is available in schools, but we need a person to provide support for teachers, and a technology curriculum for K-6. Material is useless unless personnel is provided.
Training / Support	Funding for subscriptions to applications have been an issue.
Training / Support	Not enough in-service for teachers on technology.
Training / Support	Dependability of use is my most pressing concern. There are simply not enough people being supplied to keep technology running. I waited three weeks to have a dead computer looked at in January, so for those weeks, all of my technology-based lessons went unused. Stop spending money on technology without investing in keeping what we already have running.
Training / Support	Currently to get access to Kurweil or Dragon NaturallySpeaking there is an application process. This process should be made less complicated so that students who require it as an accommodation can easily access it.

Training / Support	One major issue with technology is reliability. There are many web-based apps that can only be use with quality internet.
Training / Support	I would love to introduce more technology into my classes, but teaching eight courses with ten slots limits the time available to organizing and implementing tech into each of these classes.
Training / Support	Teachers cannot use technology as much as we would like because it is a shared resource. We need time to teach students to use it and the curriculum is so fast paced that it is difficult to add in another component. Furthermore, not all students can access technology from home.

Appendix F: References

Memorial University of Newfoundland. Faculty of Education. (2015). Strength through Collaboration: Strategic Plan 2015-2020, p13. Retrieved from https://www.mun.ca/educ/MUN-ED-Strategic_Plan_2015-2020.pdf.