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The Role of the Laptop on Teaching in a High School Setting

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Abstract

There was a question as to the importance of the computer for education in the early 1900s. As Ray (1991) reported, “After a decade of enthusiasm, there is still no consensus about the role, value, or effectiveness of computers in school” (p. 9). Has the belief in the usefulness of computers and technology changed? According to Eib and Fuller (2003), “Scores of conversations with school administrators, technology coordinators, and teachers underscore the vital role of technology management processes and systems” (p. 66). The literature seems to suggest that technology is playing a role in educational systems. What this role is, and to what extent it is being played, is the real question being addressed through this research.

The Greater Saskatoon School Division has made laptops available to classroom teachers in various schools in Saskatoon. The laptops are designated to individual teachers, not schools. This means that if the teachers were to transfer to another school, they would be able to take the laptop with them for a period of three years. Although the laptops are designated as work computers, teachers have the ability to individualize their computers for software purposes and storage of files.

The classroom, and teaching for that matter, does not seem to have changed much over the last few decades. This point is usually affirmed in responses to the question, “Could a teacher from 50 years ago, teach in a classroom today?” The answer to such a seemingly benign question is “yes.” A lack of resources, availability of funds and access to technology are not uncommon grievances expressed by teachers. Although there are changes occurring at the school level, in the curriculum and with the students, has teaching changed? This project will focus on the use of technology and the role that laptops have in fostering effective teaching and student learning.

Technology seems to be affecting every facet of educational practice and theory. In the area of teaching and leadership, technology use is not consistent. There are those who use computers in nearly every aspect in their teaching role, yet others use it sporadically and only out of necessity. The purpose of this research is to investigate whether the availability of the laptop to teachers will result in teachers changing their teaching practices or incorporating different teaching practices. Through the use of interviews and surveys conducted over one school year (2007-08), the study will focus on how Saskatoon teachers have used their laptops. Benefits from the availability of laptops and problems encountered with the use of the laptops will also be examined.

Methodology

Teachers who have been given one of the laptops from the school division were contacted by letter, e-mail or phone and asked to participate in either a survey and/or an individual interview to determine how they used the laptop and its impact on their teaching and student learning.

A survey was developed to determine the extent that teachers used this laptop for teaching purposes as well as in their administration of the class. The survey was sent out in the period from November to December 2007. The purpose of this survey was to determine the teachers' comfort with integrating the computer into their teaching practices.

Teachers were selected from different schools and asked to take part in an interview. The focus of the interview was to find out how the teachers had incorporated the laptop into their teaching practice. One set of interviews was conducted during the second semester of the 2007-08 school year. Any software or hardware programs added to the laptop, and benefits and problems that the teachers experienced, were explored in the interviews.

Presentation and Analysis of the Data

The data was collected through the use of a survey and interviews. Fifty-two teachers completed the survey and five teachers completed the interview. Their responses are provided in the tables given below. Frequencies that do not add up to 52 respondents were due to teachers who did not answer the question on the survey.

RESPONSES TO THE QUESTIONNAIRE

TABLE 1

QUESTION 1: CHECK ALL THAT APPLY TO YOU FOR HOME USE.

Response	Frequency	Percent
Mac	1	1.9
Windows	12	23.1
Wireless	1	1.9
Mac and wireless	1	1.9
Windows and wireless	30	57.7
Mac and Windows and wireless	6	11.5

TABLE 2

Question 2: Do you have access to another computer in the classroom(s) that you teach in?

Response	Frequency	Percent
Yes	45	86.5
No	6	11.5

TABLE 3

Question 3: If your answer is yes to question #2, how often do you use this other computer now that you have a laptop?

Response	Frequency	Percent
Not answered	6	11.5
Never	7	13.5
Seldom	23	44.2
Usually	7	13.5
Always	9	17.3

TABLE 4

Question 4: How often do you take the laptop home?

Response	Frequency	Percent
Seldom	8	15.4
Usually	19	36.5
Always	25	48.1

TABLE 5

Question 5: How often do you use the laptop at school?

Response	Frequency	Percent
Never	2	3.8
Seldom	9	17.3
Usually	19	36.5
Always	22	42.3

TABLE 6

Question 6: Do you have access to a data projector in your classroom(s) to use with your laptop?

Response	Frequency	Percent
Never	32	61.5
Seldom	20	38.5

TABLE 7

Question 7: The use of the laptop improves the ability of a teacher to work more effectively.

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Strongly agree	27	51.9
Agree	21	40.4
Disagree	2	3.8
Strongly disagree	2	3.8

TABLE 8

Question 8: Of what importance is it to have new teachers be technologically literate?

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Very important	30	57.7
Quite important	19	36.5
Not too important	1	1.9
Not at all important	1	1.9

TABLE 9

Question 9: Rate your level of comfort with using the laptop for work.

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Low	1	1.9
Medium	9	17.3
High	41	78.8

TABLE 10

Question 10: Rate your level of comfort with using the programs on the laptop for work.

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Low	1	1.9
Medium	18	34.6
High	31	59.6

TABLE 11

Question 11: Rate your level of comfort with fixing errors or encountering problems that may occur on the laptop.

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Low	10	19.2
Medium	25	48.1
High	15	28.8

TABLE 12

Question 12: I consistently use the laptop for aiding my professional development by searching for education material.

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Not answered	1	1.9
Strongly agree	25	48.1
Agree	23	44.2
Disagree	2	3.8
Strongly disagree	1	1.9

TABLE 13

Question 13: Is there anything that the laptop should have had in order to aid in your teaching?

Responses (number of similar responses)

- Templates for marking
- Data projector (9)
- SMARTBoards (7)
- More administrator privileges (2)
- DVD burner (2)
- Speakers/sound system (2)
- Mouse/wireless (3)
- Same software that students have access to
- FrontPage
- PowerPoint
- Longer life battery
- Own printer (3)
- SMARTBoard templates
- External keyboard
- Inservicing for classroom use
- Adobe Photoshop
- Mac laptop (2)
- Access to wireless internet (3)
- Related software programs related to teaching load (2)

TABLE 14

Question 14: Would you have preferred some professional development for using the laptop for teaching?

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Yes	16	30.8
No	21	40.4
Some	13	25.0

TABLE 15

Question 15: In your opinion, how many teachers would benefit at work from being assigned a laptop?

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Few	3	5.8
Half	13	25.0
Majority	29	55.8
All	4	7.7

TABLE 16

Question 16: How important do you feel the laptop makes for effective teaching?

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Very important	8	15.4
Quite important	37	71.2
Not too important	5	9.6
Not at all important	1	1.9
Don't know	1	1.9

TABLE 17

Question 17: What other school-work-related programs have you installed on the laptop? State the program, what it does and indicate whether or not there is a cost for the program.

Name of program (cost as indicated by survey participant is included if known)

- Google Earth
- DivX
- FLV Player
- Renamer
- IMGBurn
- Canon Photo Software
- Microsoft FrontPage
- Photoshop CS3
- Chem Sketch
- Flash (unknown cost)
- CorelDRAW 10 (unknown cost)
- Access – Math (unknown cost)
- Roxio Media Creator 9 (\$89.00)
- Font Programs (unknown cost)
- Math Type (unknown cost)
- I-Tunes
- Dreamweaver (unknown cost)
- Personal Digital Camera Software
- Noteworthy Composer for Musical Scores (unknown cost)
- Nelson Science Test Bank (unknown cost)

- Photo Filter
- Firefox Web Browser
- WinAmp
- Goldwave Sound Editor
- Media Face CD/DVD Label Maker
- Band in a Box (\$120.00)
- War Chess (\$20.00)
- Writing with Symbols – Word/Picture Processing Program (\$400.00)
- BoardMaker – Picture Communication Symbols (\$400.00)
- Audacity Sound Editor
- Learning Essentials Software (unknown cost)
- SMARTBoard Program
- Rainlendar Desktop Calander
- Macromedia Fireworks (unknown cost)

TABLE 18

Question 18: In your opinion what advantage is it to have a laptop assigned to an individual teacher?

Response Summary (number of similar responses)

- Immediate access to programs (5)
- Develop more PowerPoint presentations with data projector (10)
- Easier to bring work home/portability (25)
- Include more video clips
- Include more up-to-date resources
- Include more interactive resources (2)
- More access to educational research (6)
- Consistent access to a working computer in classroom (4)
- Quick and easy access to own files (15)
- Ease of networking at home with computer (2)
- Smaller size works well with small teacher desks
- Security (3)
- Improve technology skills (3)
- Teacher accountability

Interview Responses

Five teachers who had completed the survey and indicated that they would like to be interviewed for this study were contacted. They participated in a 20-minute interview in which the questions focused on effective teaching and the use of laptops.

INTERVIEW RESPONSES IDENTIFYING EFFECTIVE TEACHING AND USE OF THE LAPTOP

“SMARTBoard software is on my laptop, I can take my laptop home.”

“It’s a thrill for me to take my laptop home and log on from home to do my various assessments. I can do all my marks from home.”

“I have a filing cabinet but everything I’ve done in the last 3-4 years is on computer. When it’s (laptop) hooked up to the SMARTBoard I’ve had a few cases where the kids have done presentations with it.”

“The laptop is a very useful tool to allow me to be so portable and the classroom doesn’t have to be confined to just my classroom. I can take my laptop and SMARTBoard to the library and instantly everything I need is right there.”

“Being able to adapt and change things from home is the biggest difference I have seen is in my planning, my unit planning.”

“I’ve converted a lot of my lessons to PowerPoint or Publisher. I’m able now to incorporate more images or little video clips with the LCD projector we have.”

“I like to be able to work on things on the laptop at home and bring it to school. I had a laptop at home and I wasn’t comfortable bringing it to school. I feel a lot better knowing this one is for work so I feel that I need to have it here, I can bring it back and worth to home. I don’t bring a lot of my own electronic things here for security reasons.”

“I like to be able to switch between media in the classroom for teaching without having a giant TV in there. In the one instant I will have some images and notes for the kids and then I can pop in a DVD.”

“Now basically everything is on my hard drive. I am a lot more organized this way. I like with this that I have a wireless connection so I can bring it up with me and do attendance. I can access the cyber wireless. It’s not a great connection but it works just fine. Just for showing things too I don’t have to worry because it’s portable.”

“Then we realized we should be sharing what we have. A few years ago it was a much bigger task. Another guy in our department does a fair bit with PowerPoint slide shows using lots of different images and audio visual clips.”

“A lot of people tend to be moving toward the SMARTBoard. What I’ve seen is really interesting. The student can be more involved with it.”

“Now that I have one (laptop) I use them to put everything on a disc or a flashcard. I give them (students) the option (bringing their own laptop) but it’s nice for them not to bring something from home, for security reasons.”

“A lot of programs are coming in DVDs and they have a story that goes with the program. Now I can plug it into my laptop and put it on the projector and it saves time.”

“Over the years I have been book-marking a lot of sites specifically for the grade twos and then I’ve weeded out and picked out the best ones so that they don’t have to spend a lot of time going through a million sites. With the laptop I can do that at home or here. Now I can click at whatever subject I want; the material is right there. And if I need to make changes, I can make little changes and that’s it. In the long run it’s saving me lots of work. And now I can print right to the photocopier.”

“Or if you’re downloading a program from the internet that needs a projector. People with a laptop find it pretty easy to hook up. It’s becoming more used.”

“I’m backing it up to the server. But I am running out of space. Teachers are going to be building tons of files of information and that’s all going to be backed up.”

“Portability is the biggest plus for having these laptops.”

“I can look at websites and bookmark them.”

“I use it to record marks. I use Excel extensively, Microsoft Word for handouts, spreadsheets, and making posters.”

“If I’m going somewhere in the school I generally bring it with me. I can take it to the lab and the students can use the computers while I use my laptop. I have Outlook so I can check my calendar that way.”

“I update the website, so I have installed Macromedia Dreamweaver and Fireworks.”

“I find it easier to share. If someone needs something I can pull it up easily and just e-mail it to them or print it. A lot less paper too, filing cabinets aren’t as big.”

“It kind of rewards the teachers who spend a lot of their own money on laptops and whatever else they use for teaching. I feel like it’s an effective way to improve teaching in most circumstances.”

INTERVIEW RESPONSES IDENTIFYING PROBLEMS ENCOUNTERED FOR EFFECTIVE TEACHING AND USE OF THE LAPTOP

“I think maybe just upgrading the computers every year, or making sure that someone who gets a laptop is still able to use it effectively instead of feeling like its too slow; the programs are too fast for it.”

“SMARTBoards may be the future. I think a lot of schools are advocating for them. They are a big cost. I think that some traditional teaching methods are being put aside, even though they are very effective, in favor of technology. Some teachers are feeling devalued because they feel like their methods are less important or thought of less because of someone who is using technology”.

“My downloads at home are faster so I can download various videos, resources and then put them into the SMARTBoard software and then bring it back to school.”

“After using the computer for a few years I have had to rethink my organization. It’s not easy to manage because there are a lot of files saved and it’s not easy to find everything. I think my organizing on the desktop is the same as what I do on the laptop. I do save things locally on the laptop and not on the network. Three or four years ago I saved things on the network and I found that there was more downtime than I would like and I couldn’t access the files when I wanted them. When I got the laptop I continued to do that. I don’t have a backup right now if something does happen.”

“I don’t have administrative privileges. Sometimes it comes up and sometimes it doesn’t. I’m a little disappointed with the limitations there.”

“I went to a session on how to use it (SMARTBoard) so now she’s (another teacher) interested and has asked me to leave the laptop for her.”

“There’s no PLC revolving around the use of the laptops.”

“We all use it in different ways. Some people who have them maybe shouldn’t have been assigned one because I don’t feel like they are using it to the potential. If there is any maintenance on them, I don’t know if they are going to be in to school that day. I am the computer guy at the school so if there are any problems I get a technician to come in.”

“A microphone would be nice. Laptops don’t have FireWire for video. There is a lot that you can actually do with it but you would have to buy the little card.”

“I wish we could access things like YouTube or educational clips that could be used for teaching; we have to take it home in order to download it.”

“I don’t have easy access to a data projector. We have one in the school. If I had access to one I would use the laptop in a totally different way”.

“A sound system for the classroom would be nice, nothing fancy but a couple of \$100 subwoofers and speakers would be great.”

“Technical support, it’s been really good here. I had some trouble where I logged on over Christmas; immediately it crashed. When I brought it back, he got it up and running but it was so locked down that I couldn’t do anything.”

“I think they should allow us full privileges; if we mess it up they can roll us back.”

“I’m a professional. If you are going to give me a tool, allow me full access to use that tool. If I screw up, that’s why we have and need tech support, not to prevent me from screwing up. The same issue goes with the problem with accessing website. St. Bernard is a great program for keeping the kids off websites but if I’ve logged in as a teacher, there are a lot of great things on YouTube, like Shakespeare videos. Even Google videos are blocked. Yes we should be blocking inappropriate content but when I’m logging in as a professional I shouldn’t be blocked.”

“They had where you connect a video camera. If I had that here, where I could go through the steps, kids could publish their own stuff, communicate. I would like that capability now within my own realm once I broke all that into parts, then I would bring it into my lab and then say now I’ve got contact with this school, we are able to communicate now through the camera.”

“It’s not hard to get it but to actually get it, hook it up, make sure things are working and then have someone else come and want to use it. It makes it a little harder to use it when I don’t know for sure if I’ll get it.”

Conclusion

THE ROLE OF THE LAPTOP FOR EFFECTIVE TEACHING

The use of the laptop has helped many teachers become more effective at organizing their teaching material, allowing teachers to work on school-related material at home and allowing them consistent, assured access to technology that they know will always be there during the school day. The findings show that with laptops, teachers are more inclined to update and change educational material as well as find and use more educational programs that are technological in nature.

Teachers spend countless hours during the evening and weekends, many after-school hours, to try and make their teaching more effective. Having the school division commit to signing out laptops to individual teachers provides them with a small recognition that their work continues after school hours and is appreciated. This sign or gesture underscores the message that all teachers have known for years, that much of what teachers do takes place after school hours.

The ability to customize their laptop, whether this is done through programs, internet bookmarks or complete access to local files, was identified in this study as a strong benefit for teachers in using these computers. Since the teachers are able to store their own files and create personal workstations, the time that

they spend looking for known material, saving network material or accessing computer programs has been greatly reduced. The teachers have been more efficient in using their time when dealing with personal laptops.

The integration of multimedia technologies by using the laptop, in many cases with a data projector, has also made for more effective teaching. Video clips, stored on the hard drive, are easily and quickly loaded. PowerPoint presentations that possess sound, pictures and links enable the teacher to describe the subject material in a new manner.

THE BARRIERS TO USING LAPTOPS FOR EFFECTIVE TEACHING

Teachers want access to more educational software programs and hardware tools to make their teaching more effective. The cost of some programs, whether they are directly educational or are being used for educational purposes, has made it difficult for teachers to put into practice what they envision for teaching. In many cases there are lower cost or freeware programs that may bridge the gap between what the teachers want to do with their laptops and what they can afford to do.

The security features set in place for the laptop have been identified as a barrier by many teachers. The ability to completely customize and control settings is limited by the school division in setting up the laptop for the teachers. Restrictions were set in place, not to prevent teachers from working effectively on the laptop, but to minimize potential problems with the laptops.

The lack of accessibility to a data projector or wireless networking has been identified as a challenge. This technology needs to be integrated with the use of a laptop. Teachers wanted to consistently do more presentations with the laptop, but they could not because the school had not enough data projectors to share among the staff. Wireless networking was needed to make the computers more portable, especially when teachers were unable to work in their classroom or wanted to work in different areas of the school.

References

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- Ray, D. (1991). Technology and restructuring part I: New educational direction. *The Computing Teacher*, 19(6), 9-20.

Appendix A: Role of the Laptop for Teaching in a School Setting

INSTRUCTIONS

Do **NOT** write your name on this survey. When the survey is completed, place the survey in the envelope marked "Survey" and place in the mail system for internal mail. This survey will be sent to the Greater Saskatoon Catholic Schools Board Office to maintain your anonymity.

CONSENT TO PARTICIPATE

Answering any questions on this survey is my consent to participate in this survey. I understand that I may withdraw this consent at any time, prior to returning the survey to the envelope marked "Survey." Once the completed survey is entered into the marked envelope, the results will be included. If I choose to discontinue participation in the study, I will not answer further questions and return the survey to the envelope marked "Survey" to maintain anonymity.

PURPOSE OF STUDY

The purpose of this research is to investigate whether the availability of the laptop to teachers will result in teachers changing their teaching practices or incorporating different teaching practices. Through the use of interviews and surveys conducted over one school year (2007-08), questions will focus on how teachers have used the laptop. Benefits of the availability and problems encountered with the use of the laptops will also be investigated.

IDENTIFICATION OF INVESTIGATORS

If you have any questions concerning this research you may contact: Rob Kraft, teacher at Bishop James Mahoney, Greater Saskatoon Catholic School Division. E-mail: rkraft@scs.sk.ca

DEFINITIONS:

Software – A program that controls the operation of a computer; for example, Word and Excel.

Hardware – The physical parts of a computer or makes a connection to a computer; for example, printers and scanners.

Primary Teaching Field _____

Secondary Teaching Field (if any) _____

1. Check all that apply to you for home use.
 Mac computer Windows computer Wireless network/internet
2. Do you have access to another computer in the classroom(s) that you teach in?
 Yes No
3. If your answer is yes to question #2, how often do you use this other computer now that you have a laptop?
 Never Seldom Usually Always
4. How often do you take the laptop home?
 Never Seldom Usually Always
5. How often do you use the laptop at school?
 Never Seldom Usually Always
6. Do you have access to a data projector in your classroom(s) to use with your laptop?
 Yes No
7. The use of the laptop improves the ability of a teacher to work more effectively.
 Strongly agree with statement Agree with statement Disagree with statement Strongly disagree with statement
8. Of what importance is it to have new teachers be technologically literate:
 Very important Quite important Not too important Not at all important Don't know
9. Rate your level of comfort with using the laptop for work.
 Low Medium High
10. Rate your level of comfort with using the programs on the laptop for work.
 Low Medium High
11. Rate your level of comfort with fixing errors or encountering problems that may occur on the laptop.
 Low Medium High
12. I consistently use the laptop for aiding in my professional development by searching for education material.
 Strongly agree with statement Agree with statement Disagree with statement Strongly disagree with statement

13. Is there anything that the laptop should have had in order to aid in your teaching?

14. Would you have preferred some professional development for using the laptop for teaching?

- Yes No Some

15. In your opinion, how many teachers would benefit at work from being assigned a laptop?

- None Few Half Majority All

16. How important do you feel the laptop is in effective teaching?

- Very important Quite important Not too important Not at all important Don't know

17. What other school-work related programs have you installed on the laptop? State the program, what it does and indicate whether there is a cost for the program or not.

<u>Name of program</u>	<u>Purpose of program</u>	<u>Cost of program</u>
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>
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<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>

18. In your opinion what advantage is it to have a laptop assigned to an individual teacher?

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