

RESEARCH REPORT

The Effectiveness of Technology Integration into the Classroom in Rural Manitoba High Schools

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This report is a summary of a Master of Education thesis of the same name, completed in December, 2013. Over two years of data collection and analysis went into this work and represents teacher technology integration efforts pre-BYOD (Bring Your Own Device) or one-to-one computing integration models. However, given the availability of technology and the results of this study for this time-frame, some of the results of this study are noteworthy and point to more fundamental changes to teacher practice that are synergistic with technology change and not tied to any specific era of technology integration. As noted by Means (2008), despite decades of local promotion of educational uses of technology, classroom practice in most schools has changed little from that of the mid-20th century.

Students and society have high expectations of technology use in all aspects of our lives. A common phrase to describe today's student is that of a "digital native" (Prensky, 2001, p 1). Students born into this digital age have instant access to information and technology, and are exposed to computers, video games, digital music players, and cell phones from a very young age. Waters (2007) described this generation of students as "hyperconnected" (p. 1), able to connect to people, devices, and information continuously and simultaneously. Their devices and internet content are becoming one, allowing them to be connected to technology anytime and anyplace. As technology becomes more integral to society's everyday functioning, are schools of today places where technology is used in the everyday activities of teaching and learning?

There is belief in the technology-infused classroom to change teacher practice. Changes in teacher practice to recognize that the student-as-learner rather than the teacher-as-instructor can change the classroom environment. Technology offers the possibility of instant access to information, connectivity, and the use of many amazing tools for learning. As technology becomes essential for learning rather than supplemental to teaching, education practice will necessitate a change from teacher-centered to student-centered approaches.

Technology as the forefront of educational change has been at the heart of technology integration by the government of Manitoba. Literacy with Information and Communications Technology (LwICT) is a developmental continuum of technology skills meant to formalize computer literacy skills required for students to be implemented by schools (Manitoba Education and Youth, 2006). It is a progressive framework for a student-centered approach using critical and creative thinking skills for the purposes of application, synthesis, and evaluation of knowledge, in recognition that knowledge acquisition alone is only one part of learning. LwICT relies on inquiry and the application of knowledge and a gradual release of responsibility from teacher to student, in order to provide a model of learning that students can use when confronted with unique learning situations. In short, LwICT promotes a method of learning using technology to promote higher level thinking skills applied on their own with support of a teacher.

This study was significant in that it provided regional data on the technology integration into high school teacher pedagogy. Other studies have indicated a disparity between overall technology usage by teachers and the use of technology in pedagogy (Gray, Thomas, & Lewis, 2010). By examining some of the factors identified in other studies in this local study, it is hoped that some correlative data may help to develop a solution to persistent incongruities to technology integration in the classroom. Local data to these research questions provide some regional context to technology integration research, most sources of data being from other provinces or countries. The resulting descriptive data and correlations developed may be used

to help evaluate how technology integration efforts can be improved to reflect the true intent of LwICT integration as mandated by the Government of Manitoba.

Technology integration into the classroom is seen as a way of improving teacher practice to accommodate student-centered pedagogy, and the availability of technology for teachers is generally extensive (Ward & Parr, 2010). Technology integration into teacher practice has also been shown as an effective way to engage and motivate students, enabling educational opportunities in a variety of students and settings (Baek & Freehling, 2007). This study helped to clarify possible solutions to teacher practice and technology integration issues.

Method

Using a survey-based approach, this quantitative study collected data from high schools in rural Manitoba to examine the relationship between teacher use of technology and pedagogy, based on developed criteria. The results helped to establish correlations between technology availability and frequency of use for teachers, and to provide insight into aspects that affect teacher pedagogy afforded by the availability of technology in rural Manitoba high schools.

The study's primary research focus was to determine where there were correlations between teacher personal ICT use, teacher professional ICT use, and student ICT for instruction in rural Manitoba high schools and examined a number of factors that may influence teacher ICT use. Specifically, this study examined the following research questions:

1. Are there any significant correlations between the availability of various forms of technology in the school and their frequency of use by teachers?
2. Are there any significant teacher demographic factors that impact teachers' personal, professional, and pedagogical ICT use?
3. Are there any significant correlations between teacher personal, professional, and pedagogical use of ICT?
4. Are there any significant correlations between teacher-reported pedagogical orientation and teacher professional and pedagogical use of ICT?

The target population for this study was high school teachers in rural Manitoba high schools or Manitoba rural schools that contained high school grades. A total of 11 rural Manitoba school divisions, which included 21 high schools (including some grades 7-12 schools) within these divisions, provided data for this study. School populations within these participating schools ranged from schools with fewer than 100 students to schools with over 1000 students. Geographically, schools were rural schools north, south, and west of Winnipeg. The majority of participating schools were in western and southwestern Manitoba.

A survey instrument was used to obtain information from teachers in the study. The survey instrument had mostly Likert-scale type questions, numeric responses, and some open-ended questions. This study was cross-sectional in design, establishing a clear picture of teacher's technology context with regard to demographic factors, technology availability, technology use, and technology integration into pedagogy. The following sections were in the survey:

1. demographic information
2. the availability and frequency of technology use
3. outlook on teaching and learning, examining the pedagogical orientation evaluation of teachers (either student-centered or teacher-centered)
4. teacher personal use of ICT
5. teacher professional use of ICT
6. student use (teacher pedagogical use) of ICT

An online survey was used to distribute and gather information for the study. The online survey was constructed using Google documents, specifically as a Google survey. The link was not public and could be completed only by using the link provided by a principal of a

participating school (as supplied by the researcher). Schools had as few as 10 teachers to 60 or more, representing an estimated total student population of 7015 students (Government of Manitoba, 2009). Out of a total of 66 completed surveys, 55 data sets were suitable for analysis, for a usability completion rate of 12%.

The study utilized both descriptive and inferential analysis to answer the research questions. Data were aggregated and compiled to develop a statistical picture of technological affordances for teachers. Descriptive statistics helped to convey a categorized aggregated representation and to visualize the data in a number of ways. Inferential statistics were used to examine the validity of the data within groups and between groups, and to examine hypotheses between variables in order to draw conclusions and answer the research questions.

The main inferential test used in this study involved the Pearson r Product Moment Correlation coefficient (Creswell, 2008, p. 109). The Pearson test is used widely in social science research, and the Pearson r is probably the best coefficient correlation to use in educational research (Adeyemi, 2009). Correlations and co-variations were established to answer the main research questions.

Results

The study's focus was to determine whether significant correlations exist between teacher ICT use and teacher ICT use in pedagogy in rural Manitoba high schools. To answer the first research question, a number of descriptive measures and correlative analysis were used. Computer availability in the classroom and on laptop carts and computers labs were measured as well as the frequency of use. The results show that there is greater usage of computers when they are within the classroom rather than in a computer lab or on a laptop cart. The results also show that the technologies that are most highly available for teaching activities (most significantly a computer display unit, and interactive whiteboard) are the most frequently used.

The findings from the correlative analysis indicated that there is a positive correlation between the number of computers available in the classroom and their frequency of use ($r = 0.286$, $p = 0.034$); the findings also showed that there is no correlation between availability and frequency of use for the use computers in computer labs or for the use of computers on laptop carts. Other analysis regarding this research question looked at specific technology availability in the classroom and frequency of use in the classroom. The finding showed a number of significant correlations between availability and frequency of use of computer/video projectors ($r = 0.435$, $p = 0.001$), interactive whiteboards ($r = 0.826$, $p < 0.001$), videoconference unit/distance education systems ($r = 0.781$, $p < 0.001$), classroom response systems ($r = 0.756$, $p < 0.001$), MP3 player/iPod/sound systems ($r = 0.772$, $p < 0.001$), document camera/scanners ($r = 0.676$, $p < 0.001$), and handheld devices ($r = 0.793$, $p < 0.001$). The analysis of the data suggests that the less readily available a technology is, the less frequently it will be used in pedagogy. More specifically, a conclusion can be made that technology that is readily available directly in the classroom is most frequently used by teachers.

The second research question looked at demographic factors that affect teachers' technology usage. The results showed a wide range of participant teachers regarding experience, class size, and subjects taught. There was a typical distribution for factors including class size and subjects taught. Regarding years of experience, participants in this study had fewer years of experience than would be expected for the general population of teachers, with 47% reporting 10 years' experience or less.

Participating teachers had a wide range of experience and technology uses. The use of interactive whiteboards was positively correlated, indicating usage went up with greater teacher experience ($r = 0.320$, $p < 0.05$). The use of MP3 players, iPods and sound systems were negatively correlated indicating greater usage by less experienced teachers ($r = -0.286$, $p < 0.05$). Teacher personal use of ICT results indicated negative correlations regarding social web sites ($r = -0.331$, $p = 0.013$), gaming ($r = -0.303$, $p = 0.024$), photo/video sharing ($r = -0.284$,

$p = 0.036$) and media player usage ($r = -0.272$, $p = 0.044$), indicated greater usage by younger teachers. Teacher professional use of ICT results indicated similar trends, showing negative correlations for the use of word processors ($r = -0.288$, $p = 0.033$), presentation software ($r = -0.305$, $p = 0.023$), multimedia ($r = -0.267$, $p = 0.049$), laptop/netbook usage ($r = -0.289$, $p = 0.033$), and media players ($r = -0.377$, $p = 0.005$). With regards to student use of technology in the classroom, the findings show that there is no correlation between teacher experience and student (pedagogical) use of technology in the classroom.

The results for this research question indicated that personal and professional use of technology for less experienced teachers is higher than for more experienced teachers. The data showed consistent usage in what would be expected of a younger teacher, but greater usage did not correlate to greater usage by students in pedagogy. In fact, this study indicates a positive correlation between the use of interactive whiteboards and teacher experience, indicating that older teachers use interactive whiteboards more than younger teachers. One conclusion regarding younger teachers is that the correlations of greater usage of technology by younger teachers do not correspond to greater student (pedagogical) use of technology.

The third research question examined the correlations between teacher personal, teacher professional, and student use of ICT. Each type of usage was examined by measuring the parallel use of specific technologies in each of the three contexts and then analysing and correlating the results to answer the research question. Specific usage was measured from "always" (4), "often" (3), "sometimes" (2), "rarely" (1), and "never" (0). For all personal use of technology, the results indicated a total of 10 technologies scoring in the range of "often" usage (3 or above). For all professional use of technology, a total of 8 technologies scored in the "often" usage range. For student (pedagogical) use of technology, in total there were only 3 technologies used "often," none of which are in the mobile technology category. Of note are the 3 "often" used technologies for student (pedagogical) use in the classroom: word processing, search engines and presentation software.

The inferential findings indicated a total of 23 significant correlations between teacher personal use, teacher professional use, and student (pedagogical) use, summarized in Table 1. A definitive conclusion for this research question is that there was a strong correlation between personal, professional, and student (pedagogical) use of technology in the classroom.

The fourth research question examined the correlations between instructional philosophy and ICT use in the classroom. The question of instructional philosophy regards whether teachers are teacher centered or student centered in their approach to instruction. A student-centred teacher may allow more student activity in the class with technology. A teacher-centred teacher may use more direct methods of teaching, which can limit student use of technology.

The study gathered and ranked teacher instructional philosophy based on a number of questions. Questions for this part of the survey were scored and teachers were ranked with a teacher and student centeredness score; teachers were then classified as teacher centered or student centered based on their scores. Most teachers in the study indicated that they were student centered in their approach (84%).

The study also correlated the measures of teacher centeredness and student centeredness to a number of specific technology uses. With regards to teacher professional use of technology, teacher centeredness correlated negatively with word processing ($r = -0.359$, $p = 0.007$), and student centeredness correlated positively with professional use of presentations ($r = 0.340$, $p = 0.011$). With respect to student use of technology, teacher centeredness negatively correlated with student use of presentations ($r = -0.331$, $p = 0.014$) and portable storage ($r = -0.332$, $p = 0.013$), whereas student centeredness positively correlated with student use of presentations ($r = 0.316$, $p = 0.019$), multimedia ($r = 0.469$, $p = 0.011$), and portable storage ($r = 0.384$, $p = 0.004$).

A conclusion regarding this research question is that teachers' instructional philosophy does correlate to student (pedagogical) use in the classroom. This means that teachers who support a student-centered philosophy have more student usage of technology in the classroom. These

findings suggest that the use of technology, whether by a teacher or student, supports student-centered pedagogy.

Table 1.

A summary of correlations between personal and professional, and professional and student (pedagogical) use of technology

Correlation	<i>Personal & Professional</i>		<i>Professional & Student (pedagogical)</i>	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
ICT Use				
E-mail (i.e. Outlook/Outlook express)	0.447**	0.001	-	-
Webmail (i.e. Hotmail, Gmail)	0.285*	0.035	-	-
Search engines (i.e. Google, Bing)	0.454**	0.001	0.348**	0.010
Social web sites (i.e. Facebook, MySpace, etc.)	0.530**	<0.001	0.584**	< 0.001
Spreadsheets software (i.e. Excel)	0.621**	<0.001	0.415**	0.002
Presentation software (i.e. Powerpoint)	0.702**	<0.001	0.587**	< 0.001
Interactive Whiteboards (i.e. Smartboards) in lessons	-	-	0.796**	< 0.001
Subject specific technology (i.e. used only for Math, Science, etc.)	-	-	0.852**	< 0.001
Multimedia for instruction (audio, pictures, video)	-	-	0.442**	0.001
Gaming (i.e. Wii, Xbox)	0.327*	.015	0.523**	< 0.001
Web page creation (i.e. Frontpage or Google Sites)	0.632**	<0.001	0.500**	< 0.001
Blogs or Wikis (i.e. Blogger, Wikispaces)	0.772**	<0.001	0.592**	< 0.001
Social Bookmarking (i.e. del.icio.us, stumbleupon)	0.603**	<0.001	0.724**	< 0.001
Aggregators (i.e. Bloglines, Google Reader)	0.664**	<0.001	0.723**	< 0.001
Podcasting (i.e. podshow, podomatic)	0.465**	<0.001	0.696**	< 0.001
Photo/Video sharing (i.e. flickr, YouTube, UStream, Screencast)	0.656**	<0.001	0.577**	< 0.001
Chat/Video Conferencing (i.e. Skype, ooVoo)	0.531**	<0.001	0.655**	< 0.001
Cell Phone Calling	0.314*	0.019	-	-
Cell Phone Texting	0.366**	0.006	0.357**	0.007
Smartphone applications (email, web browsing, etc.)	0.611**	<0.001	0.356**	0.008
Laptop/Netbook computer	0.511**	<0.001	0.416**	0.002
Tablet Device (iPad, Samsung Galaxy Tab)	0.769**	<0.001	0.549**	< 0.001
GPS Navigation Device (Garmin, TomTom)	0.383**	.004	0.565**	< 0.001
Media Player (iPod, Zune)	0.446**	.001	0.629**	< 0.001
Gaming System (Nintendo DS, Sony PSP)	0.471**	<0.001	0.603**	< 0.001
Portable Storage (Flash Drive)	0.522**	<0.001	0.550**	< 0.001

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Discussion

One finding from this study was that the availability of computers for student use was high, although not universal or evenly distributed. While computer availability within classrooms was often low, the number of computers available elsewhere, such as a computer lab or from a laptop cart, was high. Computer usage by the entire class therefore often requires either taking a class to a computer lab or bringing in computers on a cart. Given that most students may be able to do research directly with their phone, this seems an archaic exercise and contrary to the idea of always on, instantaneous access to the internet (Jukes, McCain, & Crockett, 2010). It is important to note that the results of this study show that virtually all computers available had internet access. There was a correlation between availability in the classroom and frequency of

use ($r = 0.286$, $p < 0.05$); there was no correlation between availability and frequency of use regarding laptop carts or computer labs.

A number of reports identify mobile computing as an important technology for access to information and for use in education (Anderson & Rainie, 2010; New Media Consortium, 2012). According to the results of this study, teacher personal use of mobile technologies was relatively high, in keeping with what might be expected as normal personal use. The usage of technology changed dramatically when looking at teacher professional use and student (pedagogical) use of technology. In almost a complete reversal from teacher personal use, mobile (cell phone) technology use for professional purposes was very low. This downward trend continued with student use of mobile technologies, because the student (pedagogical) use of mobile technologies was virtually non-existent.

This research also revealed that the student (pedagogical) uses of types of interactive, collaborative, or social internet technologies were limited in the classroom. The use of web pages, blogs, and wikis was low (1.72, rated below “sometimes” use). Other web applications such as photo sharing and conferencing technologies also showed low student usage. More surprisingly (or maybe not), the use of social web sites (such as Facebook) was extremely low, which is quite the opposite of personal usage expectations of most high school students.

This study also reveals a lack of diversity in the types of technologies that students were able to use. Given the great importance that teens place on cell phone usage and the variety of technologies that they can access on a daily basis (Lenhart, Ling, Campbell, & Purcell, 2010), this shows minimal pedagogical opportunities in the use of these technologies by students. All forms of cell phone usage for school purposes – calling (1.35), texting (1.44), and applications (1.44) – were low in usage, barely above the “never” usage. Other mobile student uses showed similar lack of use. The only mobile devices that were somewhat used were laptops/netbooks (2.69) and portage storage (2.7); this was more likely because they were used in the classroom and used for storage, not for their mobile applications. The fact that a number of listed technologies were “never” used by teachers indicates that teacher choice plays a determining role in the lack of usage of technologies even if some of the usage of individual technologies may have mitigating factors regarding their use.

LwICT is a method of learning that places the student its centre, using ICT as a tool to help understand information and facilitate communication, giving choices to students to be more self-directed in their learning. Given the dearth of the uses of technology by students in this study, it appears unlikely that students were making choices. What were most “often” used in the classroom were search engines, word processing, and presentations. These results show that choice and expression are limited in these results, not supporting these aspects of LwICT.

Generalizing from the data, it seem likely that the average assignments require students to find information (search engine) and place that information in a document (word processing) , indicating a knowledge-based approach to the use of technology that does not reach into high cognitive levels such as application, analysis, evaluation, or creativity. This lower cognitive use of technology is supported by the fact that presentation software is the third highest used computer application by students and that other application uses were quite low in comparison to the three most highly used applications. Given the vast array of technologies and applications available to students (27 types were analysed in this study), the results show little use of the higher cognitive domains in teacher assignment choices for students.

In this study, the part of the teacher’s survey entitled “Outlook on Teaching and Learning” provided specific information about teachers’ reported pedagogical orientation toward teacher centeredness or student centeredness. Using a scoring system based on their responses, it was determined that 84% of teachers indicated that they were student centered in their approach to pedagogy. In looking at student (pedagogical) use of technology, the variety of technology uses was quite low, because only 3 of the possible 27 technology uses scored in the “often” range. Thus, although the majority of teachers in this study supported student-centered pedagogy, the applications of technology to pedagogy show that they did not. In other words, there was a

contradiction between teachers' pedagogical beliefs and the application of technology that would support those beliefs. This is an interesting finding, since it suggests either a misunderstanding or a misapplication of student-centered pedagogy using technology. The prominent use of display units and interactive whiteboards by teachers, with the lack of other uses of technologies, suggests a significant proportion of class time involved in the transmission of information from the teacher to student – a more teacher-centered approach to instruction.

The predominant use of search engines and word processing by students in class also suggests that technology was being used to support pedagogy not changed by technology. Student assignments that often involve forms of research to look up answers to questions for worksheets, or to research topics to create papers, show that they can apply their knowledge of a topic. In the past, these types of assignments would likely involve books for research and notebooks to write out their responses or answers to the assignments. This implies pedagogy with technology being used to direct student activities in a teacher-centered way, using substitutive pedagogical approaches with technology.

In using technology in a substitutive way, replacing old technology with new, teachers may feel that they are teaching differently, when in fact pedagogically their methods are similar. Efforts to infuse technology into learning should therefore focus more on pedagogy than technology. Effectively using technology in ways that support the curriculum and the student using LwLCT requires fundamental shifts in pedagogical thinking that have yet to take place.

The results of this study show that technology availability was adequate, able to accommodate a classroom of students when needed. As previous discussions have shown, generally there was not a change in teacher practice with regard to technology use. Also of note was that of the participants in this study, 31% reported five years of teaching experience or less, and 12% reported a year or less of experience (in other words, new graduates). Intuitively, it might be expected that there would be a correlation between general technology use in the classroom and years of experience of the teacher, but the results of this study showed no correlation. First, this indicates quite clearly that using technology does not equate to pedagogical use of technology regardless of how well one can use technology personally. Second, utilizing best-practices of technology integration into pedagogy is a professional skill set that needs to be taught to all teacher-candidates in their teacher-training programs.

Recommendations

Based on the findings in this study, a number of recommendations regarding teacher ICT use and the use of technology in the classroom can be made. A summary follows:

1. **Eliminate the use of computer labs and laptop carts.** This study showed correlations between the availability and frequency of use of computers for computers that are in the classroom. There were no correlations between availability and frequency of use for laptop carts or computer lab use. For the most effective use of technology, computers should be available in the classroom all the time and be available to every student.
2. **Allow students to bring (and use) their own devices.** Following on the first recommendation, an increased frequency of use of technology would occur by making the technology literally at hand for each student. BYOD (bring your own device) programs are already being run in a number of schools in Manitoba.
3. **Allow students to use their cell phones in class (and out of class).** Today's smartphones are often more powerful than many school lab computers and netbooks. Many high school students already have smartphones; let students use them.
4. **Use a variety of web applications and apps in the classroom (and beyond).** This study showed that there were only 3 computer/internet technologies that were widely used by students: search engines, word processing and presentations. The diversity of digital applications used should be increased.

5. **Provide greater choice to students.** The predominance of just 3 computer/internet technologies out of a possible 18 limits the choice of technologies for student use. This also suggests less of a student-centered approach to instruction than technology use affords. Results of this study suggest a more directed and lock-step approach to instruction that can be changed by offering students more choice in their assignments.
6. **Allow students greater creativity.** The choices for student technology use in this study indicate knowledge-level applications of technology that are not in keeping with LwICT principles to move learning to higher levels on Blooms taxonomy (Government of Manitoba, 2006).
7. **Use true student-centered pedagogy.** In this study, 80% of the teachers indicated a student-centered approach to instruction; however, the variety and types of technology used by students do not reflect a student-centered approach to instruction.
8. **Identify and eliminate substitutive pedagogical use of technology.** Pedagogy that does not change with the introduction of technology does not properly consider technology, content, and the context as one in the classroom. Technology and pedagogy can work together to create meaningful change (Harris & Estes, 2008).
9. **Provide professional development on new pedagogical approaches using technology.** Teaching with technology requires integrating technology into pedagogy. The key to the effective use of technology is to make a pedagogical shift first, then determine what technologies can be used to fit the new pedagogy. The pedagogical change has to occur only once; then teachers can pick, choose, and change the technological tools (which technology will require) over time to suite pedagogy.
10. **Initial teacher training must incorporate new pedagogical practices for technology infusion into the classroom.** Teaching with technology is a pedagogical skill and not a technology skill; this needs to be taught to teacher-candidates at university/college. Only by changing the teacher preparation process to reflect new pedagogical practices will teacher-candidates be trained in new pedagogical practices reflecting the proper infusion of technology into instruction.
11. **Reduce web filtering/blocking software usage.** Although teacher choice in the use of technology plays an important role in technology usage by students, the context of the classroom likely plays a role, as well. Internet/technology policies/rules and web filtering/blockage likely play a role in the decreased use of technology in the classroom.

Some of this study's results hinted at questions that were beyond its scope. A number of issues and incongruences remain in the findings, for which there are not clear answers. Further research will be required to answer questions that were raised as a result of this study:

1. What barriers exist for integrating technology into rural Manitoba classrooms?
2. How does filtering/blocking software limit access to certain web applications? This may explain some of the drop in technology usage for pedagogy.
3. What pedagogical approaches are being used by high-adopter teachers? The issue of substitutive pedagogy is important for technology integration, since even high-adopter teachers may not be using technology in a pedagogically congruent way.
4. How do one-to-one computing and BYOD programs affect teaching and learning? At some point in the future, one-to-one computing and/or BYOD programs will be the norm. The efficacy of these programs will need to be looked at in a rural setting.

Conclusion

Effective pedagogy with technology requires that established teacher practices change to embrace new pedagogical constructs. Today's teacher was taught to be a master of the classroom, to be in control of all activity all the time and ensure that every student is on track and following the curriculum step by step and word for word. It is still a teacher's job to make

sure that students meet prescribed outcomes, but the words can come from many places and the steps are there for the students to take. Students today expect to explore and construct, create and manage, play and show, and go and know. Students already have the tools to know whatever they want, whenever they want, and wherever they want. Teachers today need to accept that they need not be in control of all aspects of learning, but allow for diversity and individualization that reflects student wants and needs in a technological context. The world has changed greatly, and some fundamental aspects of teaching have changed. The challenge of teaching today is not the challenge of technology; for teachers, it is always been a pedagogical challenge. Students more than ever need our help to guide them along their path of learning. In an age when students need to learn how to learn, who better to learn from than a teacher?

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