

Learning-Oriented Electronic and Digital Media Prevent Learning Loss: South Texas Teachers' Viewpoints

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Abstract

This study examined 21 third grade teachers (native and non-native English speaking) teachers' viewpoints on the effectiveness of cyberlearning in South Texas. Findings demonstrated that 95% of native and non-native English-speaking teachers participating in this study are digital immigrants who were not aware of the existential and generational thinking schemes' gap between digital immigrant teachers and PK-5 digital native students. Digital immigrant teachers operate from the tool-used and/or technocrat (Postman, 1992) thinking schemes while digital native students do so using technology (Postman, 1992) way of being. Therefore, participants may not be aware of the power of electronic and digital media technologies in fostering cognitive, neurobiological, behavioral and socio-cultural changes.

Keywords: learning loss, digital native students, digital immigrant teachers and learning-oriented digital media

Introduction

The debate about the power of digital and electronic media in the living rooms/classrooms (Garrison & Christakis, 2005) has recently prompted a few studies on the effects of cyberlearning instruction among urban middle-class students. In fact, some scholars (Anderson & Pempek, 2005; Wartella, Caplovitz, & Lee, 2004) suggest that educational video games, DVDs and web-based learning materials could play an important role in literacy, numeracy, and overall cognitive development for school children. Electronic and digital media are more than affordable and easy ways to make learning fun and to turn playtime into educational time.

Given the fact that electronic and digital media can be a magnifier of human learning potential and capacities, we contend with Toyama (2010), that their impact will be multiplicative, not additive, with regard to deep human and social changes. For middle and high social classes, there is a tendency to see the Internet and other electronic/digital technologies as necessarily additive, inherent contributors of positive value. But their beneficial contributions are contingent on an absorptive capacity among users that may be missing in rural and low socioeconomic status (SES) schools and communities. Electronic and digital technologies might produce positive effects only to the extent that people in rural and low SES communities are willing to use them positively.

If some learning-oriented electronic and digital media and resources under an integrated learning or training plan might be considered as potentially revolutionary and multiplicative learning tools, we contend that their systematic use might lessen the effects of learning loss during the school year and summer period. Therefore, the main purpose of this research consists of examining the extent to which current K-5 teachers in South Texas are aware of not only the learning loss phenomenon among their low SES K-5 students, but also of the multiplicative and revolutionary (Toyama, 2010) nature of learning-oriented digital and electronic media resources using a quantitative approach. In the next section, the researchers will review the relevant literature on the use of computer and electronic and digital media in education.

Literature Review

Using Computers and Electronic and Digital Media for Teaching and Learning

The integration of computers into curricula is increasingly pervasive in academic environments. Research on the use of computers and electronic/digital media among learners has suggested benefits in dissolving the artificial wall between classrooms and the real world (Kajrekar, 2012), accessing a vast amount of educational materials (Kajrekar, 2012), participating in interactive, hands-on, learner-centered environments (Mohammad & Mohammad, 2012; Mostmans, Vleugels, & Bannier, 2012), changing their attitudes and perceptions toward learning (Kajrekar, 2012; Osman & Bakar, 2012), developing cognitive skills “by focusing on learning by doing, discovery, problem solving and decision-making” (Mohammad & Mohammad, 2012, p.103), developing computer-based skills to share or deliver information (Kajrekar, 2012), and enhancing language learning (Son, 2007).

For example, Ayres (2002) conducted a survey of 157 students’ perceptions of using computer software in their English and Japanese language learning process. Results showed that 80 percent of participants see that computer software programs are relevant to their needs of language learning, 77 percent believe that computers provide needed information, and 60 percent think computers should be used more often. Notwithstanding the fact that students’ attitudes toward computers are positive in a computer-enhanced class, they still believe that the computer should not replace classroom-based learning. Ayres (2002) concluded that computer-assisted learning should be closely linked to the existing curricula as a whole. One of the recommendations stated in this study was that types of computer software should be investigated in the future due to rapid changes in technology. Likewise, Lee (2005) examined technology use with a different language. Results showed that the majority of participants believe that the use of Web-based instruction assists them in their Spanish language development and cognitive skills.

Learning Loss

Learning loss refers to loss in the academic skills and meaningful knowledge (summer and school year long) that is an unsolved problem by school districts which has not received much attention from educational policy-makers. Recent research conducted by Alexander, Entwisle & Olson (2007) suggested that K-12 low SES students who do not attend summer programs (only 9.2% K-12 students attend summer programs in U.S.) experienced learning loss in the area of mathematics (2.6 months of grade-level) and reading (generally 2-3 months).

Moreover, the learning loss phenomenon is not only typical during the summer time. K-12 students, not only from rural and low SES communities (including migrant families), but also from middle and higher SES experienced it during the school year. For example, when they miss classes/learning opportunities due to illness, weather, travels, holidays, and family changes of residence for work purposes, etc. Learning loss is present where there are gaps in learning and is mostly evident among low SES students. Early gaps in learning, which are predominantly driven by summer learning loss in the elementary years, casts a long achievement shadow.

Most U.S.-born K-5 digital native children, even from low SES communities and/or non-native English speaking families, spent most of their lives surrounded by digital technologies and computers (Prensky, 2001). Most of them play video games, listen to digital music, use cell phones and use all other toys/tools of the digital age, regardless of their parents/families level of education. Recent research (Owen, Hampshire, Grahn, Stenton, Dajani, Burns, Howard & Ballard, 2010) challenged the effectiveness of digital web-based electronic resources in developing cognitive skills. Furthermore, several promising brain training programs (CogniFit, Lumosity, BrainWare Safari, etc) suggest the substantial improvement in cognitive skills and behavioral changes that are connected with cognitive functions after active participation in systematic and intensive cyberlearning instruction for a reasonable amount of time (Helms & Sawtelle, 2007; Bavelier, Green, Dye, 2010). It does follow from recent research findings that learning-oriented electronic and digital media resources can be used as important learning development tools aimed at fostering positive cognitive among children, especially those from disadvantaged homes who lack access to quality childcare or preschool (Wartella, Caplovitz, & Lee, 2004).

Methodology

The researchers used a quantitative approach to collect and analyze a survey to explore the two research questions: (1) What are the third grade teachers' perceptions toward using computers in their classroom? and (2) What are the third grade teachers' perceptions about computer and electronic/digital resources in learning loss? The aim of the survey was to provide a descriptive analysis of the perceptions of third grade teachers toward the use of computers and computer-based and digital/electronic resources in South Texas.

The participants in this research were 21 teachers teaching third grade at a public elementary school in South Texas. Of these, twenty were female and one was male. All participants were volunteers. All participants reported that they have access to computers either at homes or at the school environments.

The instrument called cyberlearning questionnaire (CLQ) consisted of components on participants' demographic background, perceived usefulness of computers, perceived usefulness of digital/electronic resources, and the impact on learning loss. This is a 32-item questionnaire. The first component, demographic background, is composed of three items and measures participants' computer usage. Perceived usefulness of computer is composed of ten items that measure participants' beliefs regarding the usefulness of computers in their teaching. Perceived usefulness of digital/electronic resources is composed of ten items that measure participants' awareness and willingness in respect of digital/electronic resources. The fourth component, the impact on learning loss, is composed of nine items that measure participants' beliefs regarding the systematic/intensive use of computer-based and digital/electronic resources to facilitate students' learning. Participants responded to the CLQ using a four-Likert scale of strongly agree (4), agree (3), disagree (2), and strongly disagree (1).

Data was collected from the participants during the spring semester of the 2011 academic year. A questionnaire was distributed to participants, along with an informed consent form. On the average, participants took approximately 20 minutes to complete the survey items. Quantitative data obtained from questionnaire items were analyzed using Kaleidagraph 3.5. Descriptive statistics, namely, mean, standard deviation, and percentage was used.

Results

Demographic data collected indicated the sample population of 3rd grade teachers who participated in the questionnaire was majority female with a frequency of 95 % (N=20). Male teachers accounted for 5 percent of participants (N=1). Distribution of the sample according to age group is presented in Table 1. The most common age range was 34 to 37 years with a frequency of 33 percent of participants. Twenty-nine percent of participants were aged more than 34, 24 percent were aged 30 – 33, and 14 percent were aged 22 – 25. In addition, distribution of the sample according to hours of computer use is presented in Table 2. When questioned about hours of computer use per day, the majority of participants (62%, N=13) spent 2 – 3 hours. In addition, 14 percent of participants spent 4 – 5 hours (N=3), and 9.5 percent spent less than one hour (N=2) and 6 – 7 hours (N=2). Only five percent of participants spent more than 8 hours (N=1).

Table 1: Distribution of the Sample According to Age Group

Age group	Frequency	Percentage
22 - 25		14
30 - 33		24
34 - 37		33
More than 34		29
Total		100

Table 2: Distribution of the Sample According to Hours of Computer Use

Hours	Frequency	Percentage
Less than one hour	2	9.5
2 – 3 hours	13	62
4 – 5 hours	3	14
6 – 7 hours	2	9.5
More than 8 hours	1	5
Total	21	100

To answer the first research question, Table 3 shows that a majority of the participants agreed that the use of computers can increase students' academic achievement (86%) and enhance their motivation; thus students feel involved with classroom activities (87%). In respect of teachers *per se*, a slightly smaller percentage (83.25%) reported that computers enhance learning environments if they can be implemented successfully, and an even smaller percentage (82.25%) reported that computers make it possible for them to switch roles from information providers to facilitators.

Table 3: Teacher Perception about Using Computers in Classrooms

Question	Mean	STD
Q1: Increase academic achievement of my students	3.43	0.51
Q2: Results in students neglecting important traditional learning resources	2.33	0.66
Q3: Is effective because I can implement it successfully	3.33	0.48
Q4: Promote collaboration among my students	3.24	0.54
Q5: Make teachers feel more competent as educators	3.10	0.54
Q6: Give teachers the opportunity to be learning facilitators instead of information providers	3.29	0.56
Q7: Help accommodate students' personal learning styles	3.24	0.44
Q8: Motivate students to get more involved in learning activities	3.48	0.51
Q9: Will increase the amount of stress and anxiety which students experience	2.00	0.45
Q10: If effective only if it is part of the students' home environment	2.00	0.55

Ten questionnaire items explored teachers' perceptions toward the use of computers, specifically in respect of computer-based and digital media resources. The results in Table 4 show a slight contradiction. The majority of the participants think that computer and digital/electronic resources are useful (88%) and creative (82%) learning tools because today's students learn differently than before (83%). In addition, they agree that there is a need for them to activate students' digital prior knowledge and experiences (82%) and narrow the digital (technology) gap between teachers and students (83%). However, for the seventeen items, a small plurality (70%) agrees that they are aware of the digital gap among their students. Moreover, results for Q12 and Q14 were quite interesting: 67% think using traditional and digital games helps their students learn the lesson better.

Table 4: Teachers' Perception Related to Computer-based and Digital Media Resources

Question	Mean	STD
Q11: Teachers integrate the use of creative applications into learning	3.29	0.46
Q12: Teachers know how to play digital/videogames and incorporate them into learning within the classroom	2.67	0.91
Q13: Teachers know how create digital and cyberlearning environments regardless of students' SES	3.05	0.50
Q14: Teachers believe that current K-5 children learn best when playing traditional and digital games	2.67	0.66
Q15: Teachers know effectively how to activate children's prior digital knowledge and experiences	3.29	0.56
Q16: Teachers gain a sense of self-confidence in using web-based technologies for teaching current K-5 students	3.24	0.62
Q17: Teachers are aware of the digital gap with their current K-5 students	2.81	0.68
Q18: Teachers are willing to bridge their digital gap to better teach their K-5 children	3.33	0.48
Q19: Teachers are aware that current K-5 students learn differently	3.33	0.48
Q20: Teachers believe that computers and other digital/electronic resources are important learning tools	3.52	0.60

To answer the second research question, nine questions on the questionnaire were related to teachers' perception about computer-based and digital media sources and learning loss as seen in Table 5. On the whole, the results showed teachers were aware of the roles that computers play in students' learning process. Responses to the two questions (Q24 and Q25) revealed that 85% agree that students benefit a great deal from being immersed in such authentic, enjoyable, and productive environments. A slightly smaller percentage reported that computers function as a promising tool in smoothing the transition from one level to the next level (83%), delivering the learning content anytime and anywhere (83%), and improving retention (79%). Responses to the four questions (Q26 – Q29) revealed that seventy-eight percent believe that computer-based and electronic/digital tools prevent learning loss and perhaps even help with reinforcing students' learning.

Table 5: Teachers' Perception Related to Computer-based and Digital Media Resources and Learning Loss

Question	Mean	STD
Q21: Increase K-5 children long-term retention and recall capacities	3.14	0.48
Q22: Increase learning opportunity because it makes content available to K-5 children 24/7 all year long	3.33	0.48
Q23: Possess repetitiveness, animation, engagement and motivational properties which help transfer information to the long-term memory	3.33	0.66
Q24: Increase meaningful learning opportunities because it is an affordable and easy way to make learning fun and to turn play time into education time	3.38	0.50
Q25: Increase meaningful learning opportunities because it is an affordable and easy way to customize content in enjoyable settings	3.38	0.50
Q26: Prevent the loss in the academic skills during the academic year and summer	3.05	0.59
Q27: Prevent the loss in the academic skills and increase K-5 retention because of its repetitiveness, animation and engagement, especially in the areas of mathematics and reading	3.24	0.62
Q28: Increase the factors that K-5 students will remember the information they learn in class through digital games by lowering the learning interference	3.10	0.54
Q29: Reduce the possibilities that previously learned information will get lost because it is mixed up with new and somewhat similar information (retroactive inhibition) based on its repetitiveness, engagement, motivational, revolutionary and multiplicative properties	3.05	0.59

Discussion

In this study, 3rd grade teachers from South Texas were surveyed to learn their experiences and perceptions about the use of computers in their classrooms. The study results indicated that overall those participants reported positive attitudes and perceptions toward computers in their classrooms. They believe that computers are beneficial teaching/learning tools. In particular, participants find the capacity to implement electronic/digital materials into the classroom activities is a useful one that helps students build up their prior knowledge and learning and keep students attentive and excited in their learning. One feature praised by the selected participants is that computers are abundant in learning materials, so students have access to learning anytime and anywhere. The fact that computer and digital/electronic materials offer interactivity, accessibility, flexibility, and portability was consistent with previous research (AbuSeileek, 2007; Kessler & Bikowski, 2010; Lamy & Goodfellow, 1999; Lu, 2010).

In addition, results revealed that the selected teachers reported not having any ideas about using traditional or digital games to facilitate students' learning. The finding contradicted the results of previous research that the use of digital games promotes students' learning. For example, Walsh (2010) conducted two case-study evaluation of digital game projects in English language classrooms among students who were struggling with literacy. The findings showed that the digital curricula had a significant effect on students' academic performance and their engagement. Digital games offer insightful ways of gaining knowledge about the learning content; students were able to complete required literacy practices with pleasure. Walsh (2010) concluded that "Digital games are a medium requiring students to interact with machines across various platforms, to understand their interfaces and become familiar with different virtual worlds" (p.24). Gros (2007), Hong, Cheng, Hwang, Lee, & Chang (2010), and Moreno-Ger, Burgos, & Torrente, (2009) come up with similar conclusions.

Another important result, for which the participants found computer and digital/electronic tools to be useful, is that of the prevention of learning loss, which provides various and innovative ways for students to participate in classrooms. That is, the participants believe that (1) students may have incentive to learn and engage with enrichment activities created by electronic/digital resources, and (2) students are able to access massive amounts of learning materials and contexts anytime and anywhere, thus helping students' retention, keeping them on track, and most importantly reducing their academic progress, especially in summer/winter months. According to Cooper, Charlton, Valentine, & Muhlenbruck (2000), "summer programs focusing on remedial, accelerated, or enriched learning had a positive impact on the knowledge and skills of participants" (as cited in Cooper, 2003, p.4). A notable example is a Project Clicar in Sao Paulo, Brazil which serves at-risk children and youth from ages 6 to 18 (Underwood, Toloza, Pranzetti, & Mahiri, n.d.). Project Clicar is an informal activity-based, after-school/out-of-school program which offers children and youth opportunities (1) to free access to computers with the Internet and other advanced technologies and (2) to get involved in additional educational activities. It is important to note that "children and youth who have never been to school or who have failed miserably in school are able, if given access to informal learning opportunities using computers outside of school, to master computer tools and techniques quickly and become knowledgeable in content areas beyond their supposed grade levels" (Underwood, Toloza, Pranzetti, & Mahiri, n.d, p.6), which lessen the achievement gap among geographical regions, racial/ethnic groups, and SES (Beglau, 2005; Brass, 2008; Cakir, Delialioglu, Dennis, & Duffy, 2009; Guilfoyle, 2004; Smink, 2007; Valadez & Duran, 2007).

Limitations and Future Research

There are several limitations in this study. First of all, due to the limited numbers of participants, especially female participants, future research should use a large scale and an equal number of participants in terms of gender. In addition, the participants in this study were third grade teachers at one elementary school in South Texas; thus, the results cannot be extrapolated to general K – 6 teachers. In addition, this study used only quantitative measures, namely surveys which were conducted to examine participants' perceptions toward computers. Different types of data should also be examined, such as classroom observation and in-depth interviews in order to gain a true picture of technology integration in classrooms. In relation with perceptions, careful consideration of the factors impacting teachers' decisions about technology integration must be made.

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