

Running head: TECHNOLOGY AND MULTITASKING

TECHNOLOGY AND MULTITASKING: A CONTENT ANALYSIS OF THE MILLENNIAL  
GENERATION & *THEIR* DATA

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## INTRODUCTION

Technological innovation is not limited to 21<sup>st</sup> century tools. The blackboard is considered one of the greatest technological innovations in pedagogy for centuries. Technology has been utilized by educational institutions including radio, television, mimeograph, overhead, computer, and interactive white boards during the last 100 years. Access to information in our digital age, “has transformed the way we produce, distribute, and receive information” (Considine, Horton, & Moorman, 2009). Information has become infinitely accessible and the Internet makes 21<sup>st</sup> century skill development (collaboration, cooperation, creativity, and critical thinking) more possible (Delacruz, 2009).

Millennial generation learners are defined as “the first generation to be immersed in Information Communication Technology (ICT) for their entire lives” (Considine, et al., 2009). Research shared by Considine and the Pew Internet & American Life Project, state that there is convincing evidence that millennial generation learners are the most prolific users of ICT. As the Millennial Generation is immersed in technology, they engage in multitasking. Multitasking can be categorized as either distractive multitasking or productive multitasking (Kraushaar & Novak, 2010).

## STATEMENT OF THE PROBLEM/RESEARCH QUESTION

This research paper will spotlight how educators and students place significant emphasis on technology in the age of *No Child Left Behind* and the Common Core State Standards. Educators seek information and data to support decision making through various forms of analytics as required by government. Data reports our current students, the Millennial Generation, is often referred to as the most technology infused generation ever. As data and

information acquisition is infinitely accessible, Millennial Generators multi-task using technology within their educational setting and social life. Research through data analysis and collection will continue to investigate if multitasking is beneficial in an educational and social environment.

## REVIEW OF RELATED LITERATURE

The development of technological innovation has propelled information acquisition and knowledge across cultures twenty-four seven in the world today (Rasmussen, Nichols, & Ferguson, 2006). Global access to such available knowledge and information has increased at a rate possibly too fast for human beings and their systems to adjust in a stable manner (Friedman, 2005). Our value placed on technology and the information it provides, is defining us as we 'live' technology and not merely manipulate it (Laura & Chapman, 2011). Analysis and interpretation of information, knowledge, and data requires appropriate tools to distinguish that which is useful from that which is useless, especially in the current educational paradigm.

President Bush and Congress enacted the No Child Left Behind (NCLB) Act in 2001, it is the most significant reform effort in modern education. The implementation of NCLB drastically altered how school leaders make decisions aimed at improving school reporting. Data collection policies have been intended as a result of NCLB, to maximize accountability for educators aimed at using data analysis. John Messelt, in his paper, *Data-Driven Decision Making: A Powerful Tool for School Improvement*, acknowledges how NCLB has increased data analysis awareness in education, albeit has been a principal instrument in human resource policy implementation plans for considerably longer. Messelt continues that data can be and is used as a powerful tool in developing school improvement policies and driving decisions not distinctly associated with

assessment results. Additional applications of data analysis are guiding technology infrastructure needs and making “informed objective decisions and not costly subjective ones.” As timely and appropriate data analysis through the incorporation of technology becomes increasingly more readily available, discerning school districts and leaders are applying “data-driven decision making techniques, not only to analyze test scores and student achievement, but also to:

- Narrow achievement gaps between student subgroups
- Improve teacher quality
- Improve curriculum
- Share best practices among schools and districts
- Communicate education issues more effectively with key stakeholders
- Promote parental involvement in the education process
- Increase dialogue within the educational community”

Establishing effective policies to govern data analysis dissemination can help prevent the loss of federal funding including Title I grants, prevent school closings and reduce student transfers. The practice of incorporating data policies is essential for redistributing resources, offering additional training, identifying curriculum gaps, creation of detailed analysis reports, determining levels of effectiveness, providing valid details for public, and identification of individual student strength and weaknesses. The implementation strategies toward data-driven instruction require the understanding and the development of ‘learning analytics.’

Learning analytics is an information technological tool which uses statistical analysis of data to discover useful information, study engagement, predict and advise student performance, revise curricula, provide real time feedback, spot potential issues, foster informed decisions, and better train staff (Berk, 2004; Johnson et al., 2011; Retalis, Georgiakakis, & Dimitriadis, 2006;

Siemens, 2011). Learning analytics was defined as the “measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs” at the Learning Analytics and Knowledge conference held May 2012.

The 2011 Horizon Report highlights the use of learning analytics and its promise to offer reliable and valid data-driven digital portfolios towards redirecting instruction as emerging in education. A result of this emerging progression in analysis is evident in policies towards increased data-driven instruction and the use of learning analytics as reshaping formal education in continued efforts to *tinker towards utopia* (Tyack & Cuban, 1995). Emerging technologies and the increased awareness of digital profiles will modify educational policy. Integration of emerging technology commonly utilized by the Millennial Generation is often met with limited appreciation in educational environments (Laura et al., 2011).

The Millennial Generation is defined as students born between the years 1982 and 2000 (Bajt, 2011; Lindbeck, 2010). Students of this generation expect technology to provide them all the information they seek in a timely manner. Millennial Generation students often use the application of technology to facilitate their decision making process. Examples include job application filings and decisions to attend a specific higher education institution on the quality of their website meeting their level of expectation (Lindbeck, 2010). Overall, technology is used by the Millennial Generation for a wide variety of purposes; including entertainment, communication, and the exchanging of information (Lehman, DuFrene, & Lehman, 2010).

The Millennial Generation is the first generation to grow in a globally connected social network era. The Millennial Generation seeks to be more connected to social networking and is focused on social interaction through games, cell phones, chat rooms, email, and listening to

music more than any prior generation (Hanson, Drumheller, Mallard, McKee, & Schlegel, 2011). Hanson et al. concluded that the Millennial Generation is less focused on academia as they compare to any prior generation. The research also describes them as goal oriented even if seeking knowledge through instant feedback and gratification. Technology tools such as the Internet, cell phones, text messaging, and social networking, provide instant information constantly. The Pew institute reported that 63% of teen students are texting daily, exceeding any other form of communication, including, phone conversation, email and face-to-face conversation (Lenhart, 2011).

Information sharing and connectedness is highest among the Millennial Generation (Hanson et al., 2011). Information shared includes “location-based services” such as Twitter and Facebook, blogging, and music sharing sites. Face-to-face communication among teens has declined from 33% in 2009 to 25% in 2011 (Lenhart, 2011). A recent study concluded the current trend towards technology based learning may further discourage the development of interpersonal attachments (Laura & Chapman, 2009). This is a dilemma for advancing 21<sup>st</sup> century skills especially, collaboration and cooperation.

A concern exists of a depersonalization in modern Western society between humans as a result of technology being used as the primary form of communication among humans (Laura et al., 2009). Laura and Chapman further conclude teachers are essential in their role of developing student self-esteem, motivation, confidence, and their “overall well-being and success academically.” The Millennial Generation are often referred to as digital natives as a result of their parallel existence with computers and the Internet (Biladeau, 2009). Public schools often attempt to block their digital natives from gaining access to such social network sites and

Internet to support control over harmful online encounters and promote face-to-face interactions (Considine et al., 2009).

Student's endless connection to information through technology supports their desire for digital media as a tool of instruction (Laura et al., 2009). Information seeking through library resources was observed to be more for "email, instant messaging and web-surfing" than library online resources and media (Hanson et al., 2011). Although the gap between teens and all other generations is narrowing between Internet usage on a daily basis, they still remain the most dominate group who "go online"

As digital natives and institutions revolutionize to twenty-first century education, the foundational inclusion of new media and technology is essential. The immersion and integration of technology in pedagogy has motivated many educational institutions, such as universities, to require technology courses for graduation or certification (Gaudelli, 2006). The National Council for Accreditation of Teacher Education (NCATE) has 65 references to technology in their standards that are designed to address technology inclusion and infusion in P-12 curricula. (Gaudelli, 2006) Society and schools have essentially become dependent upon technology for maintaining, facilitating, and communicating their function. Our trust placed in technology is based little on its value in pedagogy, rather it has been determined by society (Laura et al., 2009). It is important to recognize technology has offered society and individuals positive, purposeful opportunities for information collection and efficiency exponentially (Klorer, 2009).

Carole L. Kimberlin and others, apply the use of data in establishing a digital profile referred to as "digital learner identity." A digital learner identity is intended to describe a student as not only an individual with values, but includes a unique identity inclusive of their knowledge and talents. Most online users already have a well-established digital profile, even if they are

unaware of it. Effective March 1, 2012, Google changed its privacy policy, to better allow tracking and interests of its millions of users and accounts. Many digital natives accept reduction to individualized privacy through their use of the Internet at the opportunity to have access to almost unlimited resources. This information is becoming increasingly richer to access and in content, and valuable to markets. Research supports the improvement in technology will make things better, without a greater understanding of answering the question should we use technology (Laura et al., 2009).

Social networks like Facebook allow users to share information constantly about their whereabouts, situation and identity previously unavailable in social situations. Our self-identity often merges with our social-identity through exposure, fostering greater stability in our identities and increased productivity. For others, social media opportunities such as blogs, surveys, and social networks, develop multiple personalities not previously recognized because of limitations and access. Users of social media outlets in a multiple personality approach recognize that their ramifications and commitments are “easier and cheaper” than offline environments. Through a generalized field study at a University library in Long Island, New York, students were highly observed multitasking with their various forms of technology. The observed multitasking technology included, cell phones, tablets, MP3’s with headphones, and laptops.

Multitasking is a common behavior of the Millennial Generation. Multitasking is defined as an “attempt to do simultaneously as many things as possible, as quickly as possible” (Eisenwine & Hadley, 2011). Multitasking is increasingly more common and is viewed as a method to get as much done in a minimal time frame (Eisenwine et al., 2011). Eisenwine further explains, Millennial Generation prefer to multitask and prefer media infused learning through

either video, sound, or pictures which offer instant knowledge gratification. Multitasking can lead to overstimulation in children today (Klorer, 2009). An example offered by Klorer is two children walking next to each other down the street talking on their own phones. Obviously neither is engaged in conversation with their respective friend in their immediate proximity, yet they appear to be socializing. Another example offered is a scene often observed in a restaurant when a person is in the company of others yet sits and text messages throughout their meal. The ability to communicate wirelessly through conversation or text, certainly proves to be an amazing and efficient form of communication, but concerns for its impact on family structure and face-to-face interactions require further investigating with research. Neither form of these communications, texting or the use of phones, requires any physical or intimate contact between humans.

In two major motion pictures, future society shows humans regard for the need of actual human contact through intimacy unnecessary. Woody Allen's 1973 futuristic science fiction movie *Sleeper*, replaced intimacy with booths called Orgasmatrons and priests with confessional robots (*Sleeper* (2012)). Steven Spielberg's 2001 science fiction movie, *A.I. Artificial Intelligence*, characters robotic mechas (human cyborgs) as male prostitutes. In both movies, future societies have developed technology to further replace the need for intimacy from another human reducing physical contact and face-to-face communication (*A.I. Artificial Intelligence*).

The Millennial Generation is continuously connected to their digital world for learning, social networking, self-directed learning, and communication (Delacruz, 2009). Many teenagers report keeping their cell phones with them at all times to continuously communicate with friends. They also report maintaining close proximity to their phone, usually in hand (as was observed) and often sleep with them (Klorer, 2009).

The ability to maintain connectedness with a global society and multitask, may not allow the Millennial Generation to properly reflect if they are competent at multitasking and their ability to switch from one task to another (Klorer, 2009). Reports show that the ability of students to multitask can be detrimental. The Internet browsing of students on their laptop can show a decline academically of 10% in a lecture setting (Kraushaar et al., 2010). Debate whether multitasking of sources related or unrelated to the area of lecture are still undefined as level of distractor, but in both cases, multitasking was concluded to have a negative impact to learning and knowledge acquisition (Kraushaar et al., 2010). This is vital information for educators and academia to further consider in the learning process when attempting understanding Millennial Generation learners do not value information that does not yield immediate gratification (Lindbeck & Fodrey, 2010).

### IMPLICATIONS FOR EDUCATION

A field study was conducted at a Long Island, New York university library lobby. Observations of student and personnel behavior were recorded for two hours between the hours of 6:45 and 8:45 pm on a Tuesday in late April, 2012. This time of academic year corresponds to finals and near end of semester work. A review of the notes identified several emergent themes throughout the course of the evening. Themes included the use of technology, communication, respect, and multitasking. Technology use was observed by both students engaged in study with the use of laptops and mobile devices (for purposes of listening and communicating) and by personnel for job responsibility and social pleasures.

Implications for education include recognizing the identified themes as behaviors accepted as pertinent to the Millennial Generation. The use of technology was observed by

nearly every student who entered the library or was already in the library. Students held their cell phones in their hands most times including when engaged in conversation either walking or at a desk studying. Phones were always out whether the student was with another student(s) or alone. A connection to the mobile device was evident.

Additional observations of communication viewed included limited face-to-face talk when walking. Often students were texting while entering or leaving the library. Students showed respect for others while greeted and said thank you and hello to librarians, but rarely lifted up their head for direct eye contact. Several times while students were searching for resources with the librarian, they continued to check their mobile device or listen to music with headphones. A review of the themes clearly showed significant multitasking as the most emergent theme. Educators need to recognize and understand how the Millennial Generation accomplishes tasks. Educators need to recognize the millennial generation “are experts at multitasking because they have to be” (Hanson, 2011).

Lastly, educators need to understand the millennial generation is growing up in a world characterized by less human face-to-face interactions. Technology has become so common place in society that much of our banking is done through ATM machines or online, including check deposits with a camera. Patrons of betting and gambling locations often prefer to place their bet or exchange money with a computer instead of a clerk. Supermarkets offer customers the opportunity to have their deli order entered into a computer and prepared during continued shopping. Movies can be purchased through the TV, mail or a vending machine without visiting a retail store. Lovers seeking affairs can log onto web sites (i.e. Ashley Madison) seeking others with similar interests. Toll booth collectors are increasingly obsolete as EZ-Pass and quick travel methods are common place. Many customer service call centers are ‘manned’ by computers with

push-planned dialogue. In all of the referenced technological advances, humans are reduced in their need for face-to-face interactions and communication. Further research needs to question, if increasingly less face-to-face contact and multitasking continue, what are the benefits and consequences, as we find it easier to communicate with people at a distance, albeit a superficial level (Laura et al., 2009).

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Running head: TECHNOLOGY AND MULTITASKING

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