

Towards a Predictive Model for Texting Fluency

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Towards a Predictive Model for Texting Fluency

Abstract

Reading and writing are no longer perceived as one-way activities of receiving and transmitting information through words on a page; they are contextual learning experiences facilitated by two-way interactions where students locate, evaluate, synthesize, communicate, create, and apply information to accomplish literacy tasks in both print and electronic environments. The advancement of electronic means of communication through texting has led to questions about the potential correlation between reading and writing in print and texting, or reading and writing in an electronic medium. In trying to determine relationships between academic indicators (grade point average and incoming standardized test scores) and texting fluency, significant findings were revealed, suggesting that as performance on standardized tests increases so too does texting fluency, which is as critical to student development today, as are the print-based literacies of reading and writing. Curriculums that foster this technology provide the means for student communication and interaction with technology towards reaching learning goals across the content areas.

Keywords: digital literacy, texting, adult, oral reading

Introduction

Reading and writing are no longer one-way activities of receiving and transmitting information through words on a page; they are contextual learning experiences facilitated by two-way interactions where students locate, evaluate, synthesize, communicate, create, and apply information to accomplish literacy tasks. Evidence can be found in speaking to students of all ages about their communicative practices that include more usage of social networking and internet searches than reading of traditional print books and writing of letters (Zenotz, 2012). These trends emerged in the late 20th century but have become more pronounced with technological innovation. What must be further explored is how to link literacy studies in diverse educational contexts to students' lived worlds. Dated methods and instructional practices do not always consider this generation's interests, motivations, and realities. Therefore, more research is needed to uncover what makes university students proficient in digital literacies so that primary and secondary curricular approaches can be subsequently modified to ensure students are adequately prepared for the demands of academia and career pursuits.

Reading and writing now often transpire digitally on handheld mobile devices and computers. So it seems paramount to further investigate the concept of texting—the receiving and distributing information, also known as Short Message Service (SMS). To date, nominal research has been conducted relating one's proficiency in digital fluencies such as sending text messages in comparison to traditional reading fluencies like rate, accuracy, and prosody. Just as typing became paramount for sending and receiving information in the last half century, texting fluency is critical to the input and output of information today.

Though schools use measures for assessing students' reading and writing proficiencies, they do not have widely implemented applications for assessing texting fluency. Measuring digital proficiencies, such as texting fluency, could provide meaningful data to better inform instructors about each student's developed skills (Ba, Tally, & Tsikalas, 2002; Calvani, Cartelli, Fini, & Ranieri, 2008). After all, it is essential that students send and receive information in an efficient manner when so much content is online and freely available. The purpose of this study is to determine if academic indicators (GPA, standardized test scores) and demographic indicators (ethnicity, gender, university level) can predict texting fluency. Results from this exploration may influence how digital literacy proficiency is understood and fostered.

Theoretical Framework

This research investigation is grounded in theories of literacy as a social practice (Gee, 1996; Street, 1995) and being shaped by digital technologies (Kress, 2003; Lankshear & Knobel, 2006; Lewis & Fabos, 2005). Using multiple theoretical frameworks for this study allows for a broad understanding of digital literacies and in particular, texting fluency. The complexities and ever-changing nature of these literacies are far too multifarious to understand via a single lens (Coiro, Knobel, Lankshear, & Leu, 2008; Ortlieb, Sargent, & Moreland, 2014).

Texting is rooted in sociological contexts, which represent a stark shift from the purely cognitive models found in psychology (Crawford, 1995). As students send and receive information using digital devices, they engage in social literacy experiences. The need to successfully engage in textual reading and communication in digital environments is becoming increasingly apparent in a technology-rich society (Goodfellow, 2004). These socially created communicative communities are at the foundation of new literacies (Kress, 2003).

Literacies shaped by digital technologies, also known as new or digital literacies, offer multimodal environments for students to visualize, listen, and interact to text (Kress, 1997; Jewitt, 2009; Walsh, 2009). Crossing boundaries of home and educational contexts, these new literacies are entrenched within daily activities of both work and pleasure (Coiro et al., 2008). Moreover, digital literacies require participatory function and are collaborative by design (Wilber, 2010). Educators must learn to communicate in the language and style of their students in parallel with their ways of learning. If the utility of digital technologies including texting are to be understood, additional research is necessary.

Review of Literature

Utility of Texting

Texting uses multiple forms of media (text, graphics, images, animation, audio, and video) that work together to convey a message. The advent of computer technology embedded in mobile devices ushered in an explosion in the availability of ways to send and receive information. Multimedia learning is founded on the premise that instructional messages should be aligned with verbal and visual types of information processing (Phan, 2011). Words and pictures sent via texts are complementary as understanding occurs when one mentally amalgamates verbal and visual representations. Learners create a deeper understanding from connecting words with pictures sent via text message (Mayer, 2001).

The use of multiple modes of learning is not new, particularly in the area of instruction, where effective communication is essential (Kalaitzakis, Dafoulas, & Macaulay, 2003). Empirical evidence suggests that imagery can be an effective supplemental aid in learning a wide range of topics including language skills (Bean, 1990; Higbee, 1988; Macaulay, 2002; Paivio, 1971; Parker, Brownston, & Ruiz, 1993; Royer & Cable, 1976; Svantesson, 1998). In other

words, information is better learned if encoded through multiple channels or senses. To a great extent, this idea of multimodality could explain why texting has evolved to include textual, auditory, and visual elements.

Texting as an Information Seeking Tool

Countless adolescents and adults alike who struggle to read are highly competent and fluent at texting (Levy, 2008); yet, research has not determined what, if any, educational implications can be made from those proficient with digital literacies. If a student can quickly find information related to “engineering feats of the ancient Egyptians,” s/he is more likely to learn more efficiently, make connections to existing knowledge, apply that knowledge in an activity, and disseminate that information to others. Recent research has reported numerous advantages in using electronic texting over paper-based messages (Reinking, Labbo, McKenna, & Kiefer, 1998); these include the augmented accessibility and accommodations permissible for the needs of specific learners, which are not found in traditional printed texts.

Texting has become the most popular use of mobile phones (McKay & Thurlow, 2003). The apprehensions of the past about the utility of texting in educational settings have been eroded by its potentiality, as long as teachers clearly articulate how these mobile devices and lines of communication are to be used. Texting fluency allows one to access, retrieve, and transmit information without the threat of academic criticism or having marks taken off for misspelling and grammar-related concerns (Wood, Jackson, Plester, & Wilde, 2009). After all, exposure to misspellings does not necessarily have negative effects on the reader’s subsequent spelling acquisition (Dixon & Kaminska, 2007; Ehri, Gibbs, & Underwood, 1988). Wood et al. found that text messaging positively affected children’s phonological awareness and spelling

development. Snyder and Bulfin (2008) added that multimodal literacies best prepare students for success.

Differentiating Texting from Other Digital Literacies

Texting is one of the most efficient forms of nonverbal communication (DuVall, Powell, Hodge, & Ellis, 2007). Though e-mail is frequently utilized in personal and business realms, it is confined to communicative portals between groups of people. Texting has many utilities; for example, teachers can have their students text their literature responses or explaining their reasoning in solving algebraic problems. Websites now can be used as message boards whereby students can use their mobile phones to text responses to class queries and debates (Bernard, 2008). Texting can also open the classroom to rich discussions around formal and informal writing.

Texting has created alternative ways for teachers to hold class discussions on required reading or other in-class assignments. An added benefit is that immediate electronic communication methods are effective motivators to get students actively participating in class (Bernard, 2008). Using technology can also assist reserved students towards sharing their ideas and opinions when they would have otherwise refrained in a more traditional classroom. Whether working with English Language Learners, struggling readers and writers, or even advanced learners, having students text questions and answers allows for digital literacy development. In this way, teachers may find that they receive a greater response from electronic means of interaction than from oral discussions only. Further, students respond more critically and thoughtfully in their answers when they are provided time to process the information before responding (Bernard, 2008).

As the application of texting becomes more commonplace in and out of schools, the investigator inquired whether texting fluency might correlate highly with other academic proficiency measures such as grade point average or standardized test scores. It was conjectured that students who excel in verbal reasoning skills might text faster, allowing efficient seeking and retrieving of information towards learning objectives. The central focus of this study involved assessing students' proficiencies in texting fluency (TF) and seeking to find relationships to a number of academic indicators including standardized test scores and grade point average.

Methods

Participants

One hundred and fifty US university students at a university in the southeastern United States consented to participate in this study. They were selected based upon student availability on testing days. Of the 150 students who began the process, 131 successfully completed all portions for inclusion in the study. Following the Institutional Review Board (IRB) policies of this university, students signed a consent form agreeing to participate in the research study. An equal distribution of white and black students was selected for participation as well as an equal number of male and female students since white and black students comprise the greatest percentages of all races at this institution (*note that the terms "white" and "black" were the labels used at this institution). Participants represented all university classifications, including freshman, sophomore, junior, senior, and graduate students. All participants whose information could not be verified, or who did not complete the assessment measures, were excluded from final data analysis.

Procedures

Along with the primary investigator, three assistants were formally trained in assessing students' texting fluency in a three-hour workshop. The four researchers took part in 10 preliminary practice sessions to ensure high levels of inter-rater reliability in assessing texting fluency. These measurement estimates of inter-rater reliability are useful, only as long as there is sufficient connectedness (Linacre, 1994; Linacre, Englehard, Tatem, & Myford, 1994) across the judges and ratings, which makes it possible to directly compare judges. The preliminary research revealed high consensus (percent agreement = 99%) and consistency estimates (Pearson's $r = 0.99$) of inter-rater reliability (see Table 1).

A pre-scripted series of procedures was closely followed to ensure valid data collection:

- 1) Students were recruited using print-based and digital flyers posted around campus and on campus-related websites;
- 2) Students who replied, expressing interest in participating in the study, were recorded in a database;
- 3) An equal number of ethnic representations of randomly selected students were emailed for inclusion in the study;
- 4) Students came to the testing center and were given a hard copy of the consent form and a verbal explanation of the proceedings. They were then asked to sign the document if they consented to participate;
- 5) The researcher allotted one minute for the participant to text a scripted passage on the eighth grade reading level (a benchmark level commonly used in newspapers and other public documents) in a controlled environment free of auditory and visual distractions;
- 6) Students were told to text as fast and accurately as possible, that capitalization and punctuation were not required, but words and dates would have to be typed out in their entirety. All miscues would not be included in the words correct per minute (WCPM) calculation. Participants were told that they could use any mode of texting, whether it was regular typing or one inclusive of predictive text capabilities (T9), and asked if they had any questions;
- 7) Students texted for one minute before being stopped by the

investigator and the mobile phone handed over to the investigator; 8) The investigator checked the texted message for accuracy and the number of correct words was totaled and recorded; 9) Participants were thanked for their participation and were assured that their information would be held confidentially. Results were made publicly available in a presentation on campus.

Results

The initial investigation into the texting fluency of 131 collegiate students at one American university provided insight into four subgroups (black female, black male, white female, and white male). Scores varied slightly by race and gender with white females texting the fastest (WCPM) ($M = 29.5$; $SD = 8.1$); their rate of texting accounted for more than two additional words correctly texted per minute, and they also had the smallest standard deviation when compared to other subsets of the overall population (131). The second most proficient texters were black males ($M = 27.2$; $SD = 9.8$) followed by white males ($M = 26.4$; $SD = 9.8$) and black females ($M = 25.7$; $SD = 10.8$). Texting rates varied from 3 to 47 words correctly texted per minute. Yet, there were no statistically significant findings based on gender or ethnicity between subgroups of the overall population.

These data provided a baseline from which to conduct further analyses related to seeking correlations between texting fluency and academic/demographic indicators. In order to test the main research question, texting fluency was regressed on grade point average and incoming standardized test scores. Running regression analyses on the data set prevented collinearity, or problems associated with independent variables having major impacts on resultant coefficient estimates (Kraemer & Blasey, 2006), and allowed for the primary investigator to remove input variables with low correlation coefficients or low correlations with the desired output variable

(high texting fluency). Once the initial analyses were conducted, any variables with high correlation were further explored.

Analyses of texting fluency by gender subgroup and ethnicity resulted in low to extremely low correlations ($R_2 < .15$). Additional analysis of texting fluency by university level (freshman, sophomore, junior, senior) also led to low levels of correlation that did not clearly provide direction. For example, freshmen texted better than sophomores but equal to juniors. Therefore, these and all other demographic considerations for possible predictors of texting fluency were not further examined in analyses.

However, when determining the relationships between academic indicators such as grade point average and incoming standardized test scores and texting fluency, significant findings were revealed. The overall model using entering standardized test score performance (SAT) was treated as two distinct variables that were statistically significant for verbal ($R_2 = .31$, $F[1, 131] = 4.584$, $p < .05$) and mathematical indicators ($R_2 = .23$, $F[1, 131] = 3.651$, $p < .05$), suggesting that as performance on standardized tests increases so too does texting fluency. In contrast, the grade point average, treated as interval data, was determined to not be statistically significant ($R_2 = .12$, $F[1, 131] = 2.054$, $p > .05$) to texting fluency.

Discussion

While no significant correlations were found within the population's texting fluency and each subgroup (black male, black female, white male, white female) and gender, small disparities may indicate that other factors such as frequency of student texting activities as well as interest, access, and familiarity with mobile texting devices play a role in texting fluency. Additional research into these contextual factors is needed to provide a sufficient evidence base for which of these play a pivotal role in the development texting fluency.

On the other hand, academic-related variables had stronger relationships with texting fluency than demographics. Verbal test performance on the SAT, a commonly used standardized test for university admissions, highly correlated with texting fluency, suggesting that fluencies in print and digital mediums demand similar reading and writing skills (tracking, decoding, phrasing, predicting, analyzing, rate of communication) and content knowledge (sentence structure). These facets of language formation are critical for students to be efficient seekers of knowledge and communicators of information. Further, the high correlation of texting fluency to mathematical reasoning skills as assessed on the SAT suggests that many cognitive processes are simultaneously at work during the texting process. The concept of texting, though appearing simple from a superficial perspective, is in reality similar to observing a child reading or writing. The intellectual workings are like an iceberg, where 90% of what is going on, is not observable to the naked eye including the notion of how these texting proficiencies may have been developed or codeveloped via socialisation means.

Grade point average did not have a significant relationship with texting fluency, however, grades earned in university settings are often a composite of intelligence and effort. Using this same notion, texting fluency appears to relate to verbal and logical reasoning skills in both social and cognitive domains where interactions with others aid in the learning process, where students assimilate, synthesize, create, and communicate learned knowledge.

Limitations

Not all mobile phones are created equal in terms of supporting the use of text messages. Some are specifically designed with texting in mind (e.g., keyboards) while others require more effort to text proficiently. Keyboards range from the QWERTY keypad found on the Blackberry, full touchscreen keypads found on the iPhone and other Smart Phones, full keyboard on the

actual phone, and countless others. Smaller mobile phones may be beneficial in terms of portability but may be construed as a limitation for users with large hands or limited dexterity.

Some participants commented that their mobile phones were relatively new and therefore, they had not had sufficient time to become acclimated towards texting on that device. Others had not familiarized themselves with all of the functions and keys. Participants also noted that they normally type faster when talking to their friends since they were not texting from viewing a script on a printed page or using formal language. The use of predictive text technology, which was allowed as an option in the study, received mixed feedback as many students excelled using this technology while others were stymied when their predictive text dictionaries did not recognize particular words like a numerical year or proper noun.

Conclusion

For students to possess texting fluency, teachers must be proactive in their guiding of students alongside curriculums that must be aligned to foster these objectives, just as the importance of typing became commonplace in almost every U.S. high school nationwide. In addition, increased access and professional development must inform teacher development of these skills so they can be proficient in their instruction to reduce the gap between the texting proficiencies of digital natives and digital immigrants (Prensky, 2001). Other issues related to unequal access to mobile phones and other digital learning devices must also be discussed in relation to the speed of information movement. Those people who are digital immigrants have no prior knowledge from which to connect when attempting to become fluent in texting; they were never introduced to these literacies in early grades. Texting fluency is just as critical to student development today as are print-based literacies of reading and writing. “The current and future health of America’s 21st Century Economy depends directly on how broadly and deeply

Americans reach a new level of literacy . . . [including] proficiency in using technology”

(National Alliance of Business, 2000, p. 1). Acknowledging the standards of the past is only the first step in establishing change for preparing students to be successful in today’s digital society.

Texting fluency requires practice much like typing. As students learn to type in school, so too should they learn to text both independently and through peer interaction. This central communicative skill demands authentic learning opportunities so that students can proficiently send and interpret text messages—a skill that will surely be used for many years to come. Curriculums that foster this technology provide the means for student communication and interaction with technology towards learning goals across the content areas.

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Table 1. ETF and ORF scores for calculating the consensus and consistency estimates of inter-rater reliability.

Participants		Investigators			
<i>ETF</i> (WCPM)		A	B	C	D
1		31	31	31	31
2		22	23	22	22
3		13	13	13	13
4		41	41	40	41
5		27	27	27	27
6		21	21	21	21
7		18	18	18	18
8		36	36	36	36
9		35	35	35	35
10		46	46	46	46
<i>ORF</i> (WCPM)					
1		232	231	232	232
2		189	190	190	190
3		227	227	227	227
4		250	249	250	250
5		219	219	219	218
6		259	259	259	259
7		267	268	268	268
8		149	149	149	149
9		178	177	178	178
10		201	201	201	201