Digital Media Performance and Reading Comprehension: A Correlational Study with Brazilian Students

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ABSTRACT

The information and communication technologies (ICTs) present in the Brazilian education system determine the development of technology literacy among teachers and students, which can be measured by ICT performance. The Technology Performance Scale (EDETEC) is a self-reporting psychometric instrument to verify what the students’ conceptions are about ICT and their performance in using technology tools. Considering the necessity of the acquisition of both technology literacy and reading comprehension skills to use ICT resources, this study aimed to know the ICT performance, reading comprehension achievement, and the possible relations among them. The participants were 63 Brazilian students from K10 and K11. The EDETEC and Cloze Test with options were applied by school and grade. The best ICT performance referred to the concept and productivity tools factor (F2), and the ANCOVA (analysis of covariance) statistic test identified the influence of the grade and genre in it. There was positive correlation between reading comprehension and EDETEC.

Keywords: assessment; computer literacy; education research; IT competency; instruments; measures

LEARNING, TECHNOLOGY, AND READING COMPREHENSION

The inclusion of digital media in daily life both as a strategy for teaching and learning and as a resource for gaining access to information determines that teachers and students need to develop skills to use information and communication technologies (e.g., Joly & Silveira, 2003; Jones, 2006; Leu, Mallette, Karchmer, & Kara-Soteriou, 2005). The use of ICT as media in education requires from the user high-level cognitive abilities such as attention, memory, and reasoning. These are needed because it is necessary to identify, characterize, and understand the media’s technical information (Hobbs, 2002) and then to apply it in different situations.
with specific goals and tasks (Penuel, Korbak, & Cole, 2002). Besides these abilities, reading comprehension is seen as a basic skill (Leu et al., 2005; Solé, 1996) to acquire technology literacy because the base of communication is given by the printed language (Joly, 2004; Joly, Capovilla, Bighetti, Neri, & Nicolau, 2005; Leu, Kinzer, Cairo, & Cammack, 2004).

In the realm of reading specifically, there is a textual and/or hypertextual base (Hug & Hirumi, 2004), thus the relevance of the analysis of users’ reading skills in relation to ICT resources through decoding (recognition and attribution of meaning to words) and comprehension (interpretation of meaning of written language) as proposed by Flanagan, Ortiz, Alfonso, and Mascolo (2002). Reading comprehension produces relations among known and new information that has been acquired by means of inferences during the reading process. These inferences are defined by Adrián (2002) as verbal elaboration strategies in order to organize the printed information in a text by means of bonds of recuperation in previous knowledge. According to Téllez (2005), the inferences that the reader carries through are intimately related to the reasoning processes that allow handling the ideas offered by the text-searching coherence between what is known and, as the author says, what conditions the reading comprehension for reasoning. So, reading requires from the user both high-level cognitive abilities and the use of digital media.

Reading comprehension has been evaluated according to approaches in the content by means of reading tests consisting of questions about text excerpts with several possibilities of answers, or in the associated cognitive processes with basis in the human processing theory of information (Marini & Joly, 2006; Téllez, 2005). The evaluation based on the subject matter does not frequently capture the subject’s comprehension level, offering extreme indexes for the test items (right or wrong) related to text details and not to the author's intention and to the global understanding of what has been read (Koslin, Zeno, & Koslin, 1987). The alternative, whose paradigmatic focus in the last four decades has been assisted in cognitive psychology (Téllez), uses as a method the cloze technique and has the objective to evaluate the level of reading comprehension comparing it with others’ cognitive abilities, previous knowledge, and knowledge acquired after the teaching-learning process (Joly, 2006).

The cloze technique was created by Taylor in 1953 and consists of omitting words in a given text, substituting them with blanks that will be filled by the reader with the word that he or she thinks will be adequate to give meaning to what has been read (Joly, 2006). It is used as a trustworthy instrument to evaluate the reading comprehension level in students from elementary teaching to superior levels because it requires from the reader many abilities such as the establishment of relations among the elements of the text, association between previous knowledge and the printed information, and recognition of when it has been understood and when it has not (Joly, 2006).

**Reading Comprehension and ICT Performance**

The nature of reading comprehension competence is undergoing a process of redefinition that results from the use of electronic multimedia (Joly, 2002). Since the 1990s, the concept of literacy has been expanded. Not only in calculus, reading, and writing skills, but also the abilities associated with the use of different media and technologies are being considered for such definition. Electronic reading requires new modes of conceptualization (Reinking, 1997). While in the printed text the physical space is determined by the page, with stable content controlled uniquely by the author, in electronic text the space can be dynamic and fluent, allowing mutability. It is not a matter of considering the digital version superior to the printed one, but a differentiated option able to create and communicate messages (Luke, 2003).

As a consequence, fundamental changes are taking place in the creation of texts whose models are dynamic and creative in reading strategies and in the formation of new readers (Haggod, 2003). These readers need to accomplish...
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