Effects of technology and K12 student achievement beyond academic success. An educators' perspective

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Abstract

Educational Technology for reading literacy, mathematics and science are designed to address the shrinking test scores as measured annually by state administered assessments by engaging students in non-traditional modes of instruction to promote proficiency in testing subjects. Failing test scores created a sense of urgency in every classroom, school district, and household to meet higher levels of proficiency or mastery of content. School districts poured funding to acquire additional resources to curtail dismal trends of low-test scores to purchase computer, software, and technological supplies. Districts serving low-income, special needs and English Language students required greater funding to meet academic challenges. Low-performing students utilize educational technology in an attempt to make gains beyond traditional classroom instruction. Regardless of funding, schools and districts budgeted greater sums of resources for experimental approaches in meeting learning needs of its most challenging students. Success is relative to a given year and application of a specific approach to content and instructional device. Educational technology allows struggling, special needs, and English language students greater opportunities for success.

Technologies Impact on Academic Success

School and district success is measured by how proficient a student is when administered a standardized exam. Educational technology allows students with marginal abilities to flourish with graphic user interfaces that depict a more visual and artistic environment. Students' perception of success is crucial to academic achievement. Students possessing technology literacies view their identity as readers and writers in relation to their peers (Goldberg, Russell and Cook 2003).

Expectations are high for those enrolled in educational technology programs to surpass test scores of students in traditional content area classes. Multiple intelligences and the visual learner require multimedia to engage meaningful learning. Audio and video cues create greater levels of comprehension for struggling students utilizing educational technology (Horkay, Bennett, Allen and Yan 2006). Students need not master educational technology programs for success in reading, math or science literacy. An individual must perceive his or her value as a learner and apply himself or herself beyond that of a traditional classroom environment. Instruction is self-guided and the teacher becomes a facilitator monitoring progress through reports and observations. The student must have the will and desire to succeed for educational technology programs to be successful on any level.

The role of educational technology is seen as a two-fold solution in the realm of education. First, it is designed to assist students with limited abilities to surge to success by providing modification of instruction at a pace relative to the student's learning ability. Instruction transforms the most timid learner into a proficient individual harnessing hidden

talents and building self-esteem while promoting lifelong learning. Struggling readers and writers are given passages that are leveled to their vocabulary and current capacity of comprehension. Learning becomes meaningful with smaller steps to progress with reinforcement of skills. Students transform confidence to smaller projects and assignments that build upon learning objectives of content. Mathematics and science instruction are visual with interactive onscreen icons that allow for manipulation and feedback. Self-paced instruction dismisses judgment of peers by allowing repetitive review of concepts. Students become masters of their own learning with the support of classroom teacher, peers and positive reinforcement from caretakers.

Second, educational technology prepares every student to utilize a variety of resources in school, at home and the workplace. Manipulation of onscreen text, interaction with program windows, use of the mouse to select content, interaction with visual and audio cues and creation of artifacts prepares for more meaningful learning. Every environment a student experiences creates an opportunity to transcend learning beyond the scope of an academic setting to work and beyond. Learning how to type and manipulate a keyboard and mouse are essential skills of the new millennium. Students enrolled in educational technology are afforded the opportunity to master the latest innovations before their counterparts in traditional content courses in traditional classrooms.

Surpassing Digital Literacy Skills

The National Educational Technology Standards and Performance Indicators for Students (NETS-S) were developed in 1998 and updated in 2007. In addition to student standards, ISTE NETS were developed for teachers and administrators that demonstrate technology competencies to teach and lead for academic success beyond the classroom.

National Educational Technology Standards for Students (NETS-S) are six interlinked skills that emphasize use and application of technology. Creativity and Innovation-students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology; Communication and Collaboration-students use digital media and environments to communicate and work collaboratively, including at a distance to support individual learning and contribute to the learning of others; Research and Information Fluency-students apply digital tools to gather, evaluate, and use information; Critical Thinking, Problem Solving and Decision Making-students use critical thinking skills to plan and conduct research, manage projects, solve problems and make informed decisions using appropriate digital tools and resources; Digital Citizenship-students understand human, cultural and societal issues related to technology and practice legal and ethical behavior; Technology Operations and Concepts-students demonstrate a sound understanding of technology concepts, systems and operations.

Students are technologically savvy when using educational technology in their literacy practices outside the sphere of education to shape their sense of self as multimedia readers and writers. Educational Technology allows visual cues that assist learners to conform to diverse environments of knowledge. Blending traditional learning styles, 21st century skills, and multiple intelligences creates more opportunities for struggling students to engage in relevant forms of expression through graphic user interfaces. Students use computer technology for learning, work, socializing and fun (Ba,

Tally, and Tsikalas 2002). Students utilize out-of-school literacy practices to develop oral and writing skills without need of print materials to obtain knowledge and transfer information. Students in the 21st century are developing interactive modes of communication void of face-to-face contact through online chat rooms and text messaging. Technology has created generations of students immersed in non-traditional forms of reading and writing for purposeful meaning. Educators should allow for non-traditional methods of learning that merge academic and social requirements of today's learner. Educational technology resources merge an individual's level of knowledge with meaningful expectations to form guided learning with relevant and meaningful outcomes.

Research has linked educational technology to engaged and motivated students (Goldberg, Russell and Cook 2003). Educational technology integration creates a gateway for students lacking motivation or struggling academically or socially in school. Significant improvements in social and academic skills are attributed to success with non-traditional methods of instruction. Current evidence offers hope for students needing robust forms of academic instruction to dispel sense of failure to that of success through modified methods of learning. Various educational technology resources align academic and social enriching exercises for growth beyond scope of passing mandated state exams. Educators must be diligent in selecting appropriate educational technology resources that develop students' into productive citizens of society. Application of the wrong interventions will undermine students' ability to adapt academically and socially to an ever-changing world requiring more and more skills for perception of success; failure is real.

Technology literacy skills develop with exposure and quality of time outside of school (Ba, Tally, and Tsikalas 2002). Students of low-income and middle-income households develop relevant online communication skills (speaking & writing) that later transform to the classroom-learning environment. Technology usage tends to increase familiarity with educational technology intervention resources to promote computer literacy. Students are more comfortable using tools for socializing with peers then for learning. Thus, it may not be uncommon for students to have knowledge without necessarily having application beyond communicating with peers. Parental guidance is necessary for learners to gain understanding of the potential (good/bad) of technology. Educators may align technological literacy to methods of instruction that promote thinkers beyond pen and paper application to impact student learning and social development.

Technology standards for teachers (NETS-T) emphasize use and application of technology to inspire student learning and integration of technology resources. Educators require appropriate knowledge of instructional tools to implement relevant educational technology resources. As the students learn to conquer fear of failure, those responsible for delivering instruction have an obligation to update their skills to offer assistance and guidance. Burdens of past failures are replaced with challenges of innovation. Busy workloads are part of the profession that creates the need for meaningful and practical methods of instruction to lessen stressful practices.

Accountability is dual when educational technology resources are implemented to a learning environment. Success or failure of students rests on an educator's willingness to go beyond his or her scope of knowledge to deliver and provide meaningful forms of learning to meet demands of the struggling learners. Educational technology builds confidence in educators and student to realize academic success through non-traditional methods of instruction.

Meaningful Assessments of Knowledge

Educators should enact meaningful modes of assessment to match students' individual learning style, whether print or technology administered (Pommerich 2004). Raising the level of proficiency by engaging the learner in the assessment process is critical to reach adequate levels of progress. Struggling students require a voice in the assessment of their knowledge. Educational technology is capable of transforming classrooms and schools to meet the needs of struggling learners (Abell, 2006). Educational technology attempts to mend holes that many have fallen through over the years by administering content and learner relevant instruction. Perception and realized success is crucial to implementation and adoption of educational technology. Reaching higher levels of comprehension through interactive materials offer struggling students opportunities unavailable under traditional methods of classroom instruction. Traditional and non-traditional methods of instruction offer greater means of classroom and social success when applied in an environment open to alternate methods of learning.

Educators that develop relationships between examinee and assessment create more purposeful student success (Almond, Steinberg, and Mislevy 2002). Literacy and educational technology form a dual purpose of ensuring student success through relationship of instruction and method of assessment. Knowledge and assessment are sequentially monitored for implications of learning. Assessments produce relevant outcomes to gauge learning and/or application of skills. Educational technology resources have the potential to broaden the scope of reading and writing methods of assessments. Opportunities exist for learners and educators to reflect upon learning and assessment methods for future success. Educational technology resources are very resourceful in meeting needs of diverse learners and potentially beneficial to learner's social environment (Ba, Tally, & Tsikalas, 2002). Educational technology has a firm hand to acquire and deliver knowledge to struggling learners. Students' perception of success is crucial to academic achievement when allowed to interact with meaningful forms of instruction that caters to different levels of comprehension without minimalizing learning objectives.

Student perception of success matters, not ours

Academic success is realized when educational technology extends beyond confines of traditional learning (classroom, school) environments for lifelong learning (O'Dwyer, Russell, Bebell and Seeley 2008). Students that have the ability to apply technological skills to academics and social arenas seem to have a greater grasp of reading and writing compared to their peers (Gulek & Demirtas, 2005). Technology becomes beneficial for academic and social growth that surpasses prior levels of success known to struggling learners. Relationships that merge technology usage and academic success are meaningful to measure growth potential of learners. Forms and uses of educational technology differ in their results in relation to student success.

Rationalizing differences in performance implementation of assessment methods to overall student success and possible failure must be a consideration of test administrators (Horkay, Bennett, Allen, Kaplan, and Yan 2006). Student familiarity with educational technology resources may allow for greater understanding of content but differs from

format of assessment. Current methods of assessment negates educational technology format to allow greater acceptance by students. Beginning fall 2013, new state assessments would involve use of educational technology (computers, tablets) to administer exams. Shifting methods of assessment may level the playing field for those experiencing test phobias to traditional pencil and paper structure. Traditional learners may experience a negative shift in application of knowledge due to unfamiliar format and possible added anxiety. Assessments using technology may conjure up fear for those accustomed to old brick and mortar methods. Educational technologies produce different results for examinees depending on structure and subject matter (Shapley, Sheeman, Caranikas-Walker, 2010). An individuals' level of technology skills and knowledge of content may skew results when testing outside modes of comfort.

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