

DIGITAL GAME-BASED LEARNING

Digital Game-based Learning (DGBL) is an emerging frontier in K-12 learning. As with any transformative practice in education, successful integration into everyday practice in schools takes thought, time, and effort — prior to, during, and after phase-in. This paper offers five key issues to consider in exploring and embracing the potential of DGBL.

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*False Premise?
Fun 'n Games?*

*Or Future-
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Digital Game-Based Learning: False Premise, Fun ‘n Games, or Future-Focused Learning?

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Introduction

Online and digital delivery of K-12 learning, including digital game-based learning (DGBL), is exponentially growing in usage and in functionality. Teachers, who bring hands-on knowledge and expertise to the table, typically welcome a sense of involvement in strategic decision making from administrators. Educational leaders, however, need to be drivers, not passengers, on this journey and guide the evolution of digitally enhanced learning so they can shape and direct its emergence and usage. Both teachers and educational leaders can then use DGBL to focus on their ultimate goal of student growth and achievement. Students can and should be drivers in the process, too. Professional educators need to “own” DGBL so they can make their own larger organizational agendas part of DGBL’s emergence, implementation, and usage.

We, as educators, need to shape DGBL to optimize its potential to help students learn, not merely let it shape us.

– *Dr. Bill Daggett, Chairman/Founder, ICLE*

However — more specifically — how should we shape DGBL?

Three nationally recognized leadership organizations: the International Center for Leadership in Education (ICLE)/Successful Practices Network (SPN), LTS Education Systems/Stride Academy (LTS), and Southern New Hampshire University (SNHU) have recently formed a partnership to identify best practices in implementing DGBL in the classroom. For the purposes of this briefing, findings to date will be aggregated into the following five key points for educational leaders to consider as they seek ways to embrace the power and potential of DGBL.

1. **Efficiency/effectiveness.** Consider such variables as implementation time/cost vs. value to students, not just in DGBL’s ability to advance academic achievement, but also in its potential to:
 - leverage significant existing research on digital learning
 - engage students via active (vs. passive) learning
 - offer built-in “adaptivity” and customization to meet individual student needs and thereby promote a sense of personalization and self-confident success that supports academic growth and achievement
 - address and develop (sometimes hard to teach) non-cognitive skills and attitudes/“soft skills” (e.g., patience, discipline, perseverance, delayed gratification, learning through trial and error, etc.)
 - build academic tenacity/persistence and the desire to learn
 - become a less threatening, initial way to implement new and emerging technology into our schools than comprehensive online learning systems.

Installing an online learning system to address the academic curriculum can be a useful delivery tool. It can also, however, be an expensive and disruptive proposition for schools and an overwhelming change and (at least initially) challenge for teachers. DGBL is a less expensive and less “intrusive” (and more manageable) entry point into digital learning, yet it can still address the academic content and skills to help raise student achievement. Quality DGBL should provide foundational skill sequencing and instantaneous, targeted feedback to students on academic mastery. It should also be “agnostically” accessible by students — on computers or tablets.

Change in our schools needs to be evolutionary, not revolutionary. DGBL enables schools to be evolutionary in a cost-effective way.

2. **Grades vs. rewards and recognition.** DGBL provides learning mechanisms that separate “getting marks” from a personalized and internalized sense of accomplishment (*e.g.*, earning high scores, medals, and badges - and for honest effort) to reinforce the notion that “just trying matters”; it’s not all about getting an “A.” Confidence building is an important ingredient — and outcome — of DGBL-fostered learning. Getting a chance to win against an opponent, one’s own “top score” record, or just the game itself builds confidence and encourages further engagement. Overwhelmingly supportive research-based evidence attests to the motivational value of DGBL.

The true incentive [of students for learning] should be a feeling of accomplishment, confidence, and capability. That can be difficult to manage when learning is defined as a test score.
– *Ray McNulty, It’s Not Us Against Them (2009, ICLE)*

3. **“Cognitive/logistical complexity” and overload.** Expecting too much/too soon doesn’t equate to more or better learning; students (and adults) don’t like to feel overwhelmed when mastering something new. Learning and growth happen more readily and naturally (and less stressfully) when digested in small “chunks” at the learner’s own pace. Simpler and less involved DGBL with limits on performance tasks and variables is well suited to learning in the classroom — perhaps more so than extended and complex digital games that can spread over hours and even days. Keep it simple and easy to use and don’t overreach, especially initially. Leave World of Warcraft for potential enjoyment at home.

Additionally, consider the challenges of implanting any initiative — digital or otherwise. Students and especially teachers need to implement and utilize DGBL with minimal anxiety, stress, and disruption to existing classroom practices, processes, and priorities. Both groups — young and old — may experience initial technophobias. Teachers may initially feel overburdened with yet one more requirement and “new thing” to do. Individual students and staff members may need more coaching, leeway, or time to embrace DGBL. Those natural and predictable human factors are one more variable to anticipate, consider, and accommodate before, during, and after implementation. Encouragement, patience, reassurance, and “keeping things simple” at first will likely be helpful.

There are solutions that won’t disrupt much at all — and will actually integrate rather seamlessly in complete alignment with a district’s or a teacher’s existing curriculum — and that is key to successful implementation. Innovations such as our new StrideXchange will provide a DGBL platform that even allows teachers to leverage their own instructional resources.
– *Brian Shulman, Founder, LTS Education Systems*

Schools and districts have already discovered that after ample time and experience have familiarized their students and staff with simpler, user-friendly DGBL it is possible to “graduate” to more complex forms of DGBL. This may include students creating their own learning games as is being fostered in the promising new partnership that LTS and SNHU have initiated. (Refer to the Summary for more information.)

4. **Purposeful, but student focused.** The love of play is shared by all ages, but fun is often experienced and defined differently by students than by adults. Make sure that DGBL is kid-friendly and also age-appropriate: play has traditionally happened everywhere and throughout life — except as a regular element in the classrooms. Traditional types of learning games used at school (*e.g.*, Jeopardy, spelling bees, 20 Questions, crossword puzzles, etc.) may not be as much fun for younger and older students as adults might want to believe. Leverage the human trait of seeking fun, but seek DGBL resources that kids and teenagers will enjoy. Have students “test drive” options.

5. **Brain research.** Playing *IS* learning, in part because human brains are “plug and play”: without first making right or wrong judgments, they immediately react to stimuli and actively respond accordingly. For example:
- Is this something or someone I know and recognize or understand? If so, OK.
 - Or is this something unknown or unfamiliar and needs analysis, “ordering,” or resolution? If so, what should I do?”

Cognition also adjusts to suit the context and needs of individual learners; some students learn best when playing with or in competition with others. Other students learn better by playing alone (*e.g.*, against the program or trying to beat their own previous high scores or current goal).

Brain research explains the impact of engagement on brain function, including studies on brain health by neuropsychologists such as Dr. Paul Nussbaum, Adjunct Associate Professor of Neurological Surgery, University of Pittsburgh School of Medicine and an advisor to ICLE, who has concluded that:

. . . mental stimulation . . . [enhances] neurogenesis (new brain cell development) for [brains] exposed to enriched environments that include novel and complex stimuli [and] . . . environments that provide novel and complex stimuli are those most likely to be deemed “enriched” with the greatest likelihood of promoting “brain reserve.” Brain reserve refers to the development of increased cellular connections (synapse) . . .

– Paul David Nussbaum, Ph.D., *Building a Brain Health Environment in the School*
http://www.leadered.com/pdf/Build_Brain_Healthy_Environment_2014.pdf

In short, effective DGBL is highly nutritious “brain food.”

Summary

DGBL is one of the most promising aspects of the growing and undeniably effective shift toward implementing and leveraging digital technology tools in today’s schools and classrooms. Educational leaders need to be part of (and shape) its use.

- Properly planned, communicated, implemented, and managed, the potential paybacks of DGBL can be significant:
 - For students: fun, engagement, rewards, recognition, achievement *and* a *sense* of achievement
 - For teachers: more time to do what only a teacher can do — coach individuals and work with groups, while student academic achievement is enhanced
 - For district and school administrators: heightened academic achievement, lower instructional costs, lower staff stress levels, fewer hassles, and parent and community support.
- As an overarching caution (and speaking of human intelligence processing and adopting in incremental bite-sized “chunks”), DGBL shouldn’t be introduced as a be-all, end-end solution and all-encompassing panacea. Rather, guidelines include:
 - Be careful
 - Start small; begin slowly and incrementally
 - Build staff and parental acceptance, support, and enthusiasm
 - Make change evolutionary, not revolutionary.

In early 2015 LTS announced an important partnership with SNHU, the first ever ***Stridebuilder Game Design and Development Program***, an opportunity to guide, advise, and support today’s and tomorrow’s educators in the effective uses of DGBL-enhanced instructional methods and learning. (Refer to the press release <http://www.prweb.com/releases/2015/03/prweb12615190.htm>). This promising initiative will reinforce the notion of how starting off slow and simple can allow educators to, in due course, take DGBL to a whole new level of student-developed games aligned to curriculum and learning goals, yet taking place in a project-based learning scenario.

Organization Snapshots

- **Southern New Hampshire University (SNHU)** is a private, nonprofit, accredited institution with more than 3,000 on-campus students and 50,000 online students, making it one of the fastest growing universities in the United States. In 2012, SNHU was named the 12th most innovative company in the world by *Fast Company* magazine (the only university so honored). Over the past 11 years, SNHU has become a leader in reshaping the higher education landscape, in part because of its innovative engagement in an array of delivery models for student learning, intentionally designed and developed to serve the different and diverse populations of students seeking higher education credentials in the United States. See <http://www.snhu.edu/>.
- **LTS Education System/Stride Academy (LTS)** is a veteran pioneer publisher/developer of digital game-based learning platforms founded in 2001. Brian Shulman founded LTS after recognizing the need to reach at-risk youth and teach them basic skills in a new and engaging online format using motivating video games and competitions among peers. For over a decade, LTS's work has focused on reaching underperforming students to improve academic outcomes, while continuing to challenge their high-performing peers — using one platform for all types of learners. They accomplish this through an adaptive diagnostic technology that teaches skill acquisition at the right pace that each student requires. See LTS success stories, reviews, case studies, and results at <http://www.ltseducation.com/research.php> or visit them at <http://strideacademy.com/>.
- **International Center for Leadership in Education (ICLE)**, founded by Dr. Bill Daggett in 1991, is a nationally recognized leader in providing services and resources to support K-12 educational leaders and professionals in addressing school improvement and innovation. ICLE's mission is to challenge, inspire, and equip today's educators – both teachers and leaders – to prepare their students for lifelong success. They do this by identifying innovative practices from across the country, ensuring that those practices make a positive impact on student learning, sharing those successful practices with educators through conferences and keynote presentations, and helping schools bring them to scale with professional learning opportunities and hands-on consultation. At the heart of all it does is ICLE's proven philosophy that the school's entire system must be aligned around instructional excellence — rooted in rigor, relevance, and relationships — to ensure every student is prepared for a successful future. See <http://www.leadered.com/about-us/>.
- **Successful Practices Network (SPN)** is a not-for-profit organization founded in 2003 through a generous gift from Bill and Bonnie Daggett, committed to helping educators create a culture of rigor, relevance, and relationships for all students. SPN works with schools, districts, regional education centers, state departments of education and other partner organizations to share resources (including its widely used *WE™ Surveys* that measure perceptions of students, teachers, administrators, and parent/community stakeholders about their schools), data, research (including findings from its multi-year study of best practices that was funded by the Bill & Melinda Gates Foundation), and technical assistance (including its *Career and Technical Education Technical Assistance Center*, which SPN operates under contract for the New York State Department of Education (NYS CTE TAC). SPN also hosts the *Career Readiness Institute*, a membership organization that supports educator efforts in helping students become career ready. Contact (518) 723-2063 or Info@SPNet.us.

Since 2013, Bill Daggett, Ray McNulty, and SPN have collaborated with LTS to explore the potential of — and best practices in — DGBL across K-12 education. To help advance their ongoing research, SPN and Stride Academy would be grateful to receive any examples of DGBL best practices that will inform the efforts of districts and schools across the nation. Your comments are very welcome and appreciated. Please contact:

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