Digital Teachers, Digital Principals:

TRANSFORMING THE WAYS WE ENGAGE STUDENTS

"We want our teachers and students to experience transformative teaching and learning through technology. The goal is to create opportunities for students to create knowledge and products that could not have been done without the availability of technology."

– Instructional Technology Specialist, Brooklyn City School District (Cleveland, OH)

INTRODUCTION

As the new school year starts, K–12 education leaders all across the country are re-focusing their efforts on providing students with learning experiences that develop the college, career and civic readiness skills so highly coveted by higher education, employers and policymakers. In many districts, this means a significant change in curriculum and classroom teaching methodologies. Not surprisingly, school and district leaders are increasingly interested in exploring new roles for the use of emerging technologies to support this transformation of the classroom learning process. According to district administrators, at the heart of those explorations are three new learning modalities:

- the blending of student-directed online learning with face-to-face teacher-led instruction,

- the integration of mobile devices into instruction to support both teacher productivity and the personalization of the learning process for the student, and

- the use of digital content such as videos, simulations, animations and game-based environments to create additional context and relevancy within the student learning experience.

This white paper examines the evolving role of digital content to support student learning from the perspective of the classroom teacher and the school principal. Starting with a broad review of digital content use to empower transformed learning experiences, the white paper delves specifically into the emerging role of digital games to both engage students and enable a new classroom environment. As will be discussed in this paper, how and why teachers adopt digital game-based learning environments in the classroom is a meaningful exemplar for the greater embracement of digital content within instruction.

The latest Speak Up research provides the foundation for the discussions within this new white paper. Project Tomorrow, a national education nonprofit organization, facilitates the annual Speak Up National Research Project and, as part of this initiative, annually reports on the growing student, educator and parent interest in the use of digital content, tools and resources to create transformational learning opportunities in and out of the classroom. In this paper, we examine the trends from our analysis of the Speak Up data collected in Fall 2013. Over 403,000 K–12 students, parents, educators and community members participated in Speak Up 2013, a special collaboration between BrainPOP® and Project Tomorrow®. To support the survey data findings, two profiles examine how digital content is changing the classroom-learning paradigm. In one profile, we learn how a classroom teacher is seamlessly integrating digital content within his everyday classroom practice, and in a second, a school principal makes the connection between leveraging a wide range of digital tools and resources and supporting enhanced student engagement and teacher effectiveness at his school. Both of these mini case studies provide supplemental new insights into the adoption process for digital content in the classroom and are valuable in setting additional context for the Speak Up data results.

THE KEY FINDINGS IN THIS NEW WHITE PAPER THEREFORE INCLUDE THE FOLLOWING:

- Over one-third of elementary teachers (35 percent) and 1 of 5 middle school teachers (21 percent) report regular usage of digital games within their classroom.

- These game-using teachers see the primary benefit of digital games as increased student engagement in learning (88 percent); 72 percent of digital principals agree.

- Teachers who are using digital games in their classroom have a greater appreciation for the overall impact of technology on student outcomes and teacher effectiveness.

- 60 percent of school principals say that not having enough computers or devices with Internet access is a major obstacle to the greater adoption of digital content in their schools.

- Both teachers and school principals share a common set of determinants for evaluating the quality of digital content.

Technology use for learning by students

As discussed in this year's national report on the Speak Up 2013 data findings, *The New Digital Learning Playbook: Understanding the Spectrum of Students' Activities and Aspirations*, the general assumption is that technology use for student learning is facilitated predominantly through teacher-sponsored, classroom-initiated activities. And indeed, students and teachers are increasingly using a wide range of different digital tools to support the formalized instructional process. Within this arena of teacher-enabled technology use, students across all grades report using digital or online textbooks, accessing information posted by their teacher on school or class portals such as grades and homework, taking tests online, and even watching videos created by their teachers especially for their class. Following a national trend, one-quarter of elementary students in grades 3–5 and almost one-third of students in grades 6–12 say that they are also using a mobile device provided by their school to support schoolwork.

The teacher-sponsored technology use not only occurs at school, however. When a teacher assigns Internet-based homework or implements a flipped learning classroom model, the student use of technology at home is still under the guidance of the classroom teacher. Beyond teacher sponsorship, however, students are adapting various digital tools and resources to self-support their schoolwork and learning activities. As noted in previous Speak Up reports, students are not just adopting new technologies to use within learning, but they are actively manipulating and modifying traditional uses of these digital tools to meet individualized learning needs. The adoption/adaption process includes how students use various digital tools to support schoolwork in the classroom, and how technology enables students to self-direct learning around their own academic interests outside of school. Examples of the adaptation process to support schoolwork include using Facebook or other social networking sites as hubs for class project collaborations or finding online videos for math homework self-remediation. A growing number of students are also tapping into videos, TEDTalks, online games, and online interest groups to explore academic curiosities or to learn particular skills outside of school-based learning activities.

Technology use for instruction by teachers

Teacher usage of technology and specifically digital content includes both tools to support teacher productivity and content that enables student learning. Within the category of teacher productivity tools, 60 percent of teachers report that they are regularly using presentation type products (PowerPoints, Prezis) within instruction and 35 percent say that they are accessing online lesson plans, teaching aids and assessment tools to help support their classroom activities. More germane to the focus of this white paper, elementary and middle school teachers also report that they are regularly using a variety of types of digital content to support student learning in their classroom as noted in Table 1.

For example, from 2008 to 2013, the number of teachers who identified digital games as a key component in their version of the ultimate school rose 48 percent.

TABLE 1
TEACHERS' USAGE OF DIGITAL CONTENT IN THE CLASSROOM

TYPES OF DIGITAL CONTENT

- Videos
- Online texbooks
- Digital games
- Software or mobile apps
- Animation

ELEMENTARY SCHOOL TEACHERS

47%
22%
35%
31%
19%

MIDDLE SCHOOL TEACHERS

49%
29%
21%
18%
22%
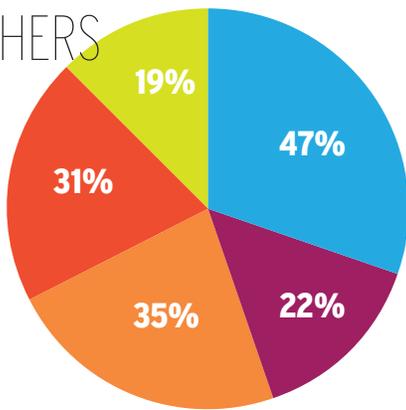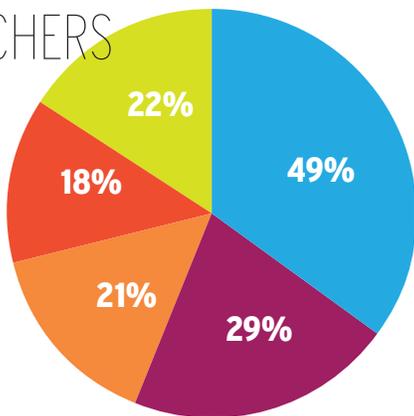
Within this list, digital game-based environments provide an interesting case point for further exploration as to how and why teachers adopt digital content within their instructional practice. Based upon the Speak Up findings, games are significant within this discussion for three key reasons. First, teachers are demonstrating increased interest in the potential of games to support student learning. For example, from 2008 to 2013, the number of teachers who identified digital games as a key component in their version of the ultimate school rose 48 percent. Second, teachers ascribe various roles to the use of digital games within the classroom, thus providing an interesting backdrop for examining their motivations for usage. Finally, students' high interest in the use of digital games within learning is a consistent theme throughout the Speak Up analysis and reports, and their parents are increasingly sharing that interest. This increased demand for more digital learning experiences on the part of parents and students is driving many school administrators to look differently at the role of games within learning. In the Speak Up 2013 surveys, over one-third of school principals (35 percent) identified online or digital game environments as having the greatest impact today on transforming teaching and learning at their school. Additionally, over a quarter of school leaders identify digital games as a key component of their vision for the ultimate school for today's learners.

Given the increasing interest of teachers in using digital games to engage and empower learning, and the growing support of school principals in this new learning modality, it makes sense to learn more about the attitudes and behaviors of these early adopters. In this white paper, therefore, we examine how teachers who are using game-based environments in their classroom view the impact of technology

on both student learning and their professional productivity. These early adopter "digital teachers" serve as an exemplar for the larger discussion around what is needed to support teachers' adoption of digital content in the classroom. In a similar way, we focus our attention on the early adopter principals as well: school leaders who see digital games and content as playing a major role in transforming the student learning experience. These "digital principals" are a model for how administrators can support their teachers' capacity development in terms of digital content usage in the classroom. The findings in this paper, therefore, provide valuable new insights to both administrators and education policymakers who share a significant interest in understanding how to leverage digital content, tools and resources to support students' preparation for future success.

DIGITAL TEACHERS:
Using digital game-based learning environments in the classroom

Classroom teachers who are using digital games within instruction (25 percent of all classroom teachers) view the role of technology within learning through a unique lens. This perspective is shaped by their motivations for using digital games in their classroom and the impact of those implementations on student learning and their own professional productivity. Additionally, based upon the experiences they have gained using digital content in their classroom, these digital teachers also have high expectations for the quality of digital educational resources. Most notably, the values, attitudes and behaviors of these digital teachers are remarkably different from those of their peers who have not implemented game-based environments within their classrooms. While the Speak Up reports have long documented the existence of a digital disconnect between students and teachers on the sophisticated usage of technology, it is now evident that a new type of digital disconnect exists between teachers who have adopted digital content successfully within their instructional practice, and those that have not. By studying the values, attitudes and behaviors of these early adopting digital teachers, schools and districts can develop more effective strategies for replicating and scaling the adoption of digital content within classrooms.

Using technology to support student learning

In the quest to move from using technology for lower order thinking skills into higher order thinking skill development, the teachers who are using digital games in their classroom are motivated by the benefits of game play in reaching these goals. Specifically, these digital teachers are more likely than their peers to see correlations between the education game experience and the higher levels of Bloom's taxonomy for learning such as analyzing, evaluating and creating. Table 2 illustrates a comparison between the cohort of teachers who are using digital games and all teachers in how they are using technology to support student learning.

Additionally, over a quarter of school leaders identify digital games as a key component of their vision for the ultimate school for today's learners.

TABLE 2
HOW ARE YOU USING TECHNOLOGY TO SUPPORT STUDENT LEARNING?

USES OF TECHNOLOGY	TEACHERS WHO ARE USING DIGITAL GAMES IN THEIR CLASSROOM	ALL TEACHERS
• Customize content to meet specific learning needs	• 52%	• 39%
• Examine student performance trends to enhance instructional plans	• 43%	• 31%
• Encourage student self-monitoring of learning	• 36%	• 29%
• Conduct student-led investigations	• 36%	• 26%
• Facilitate student collaborations	• 30%	• 23%

As noted, teachers who are using digital games have a higher appreciation for the role of technology in empowering learning environments that encourage student self-directed learning and collaborations. Additionally, these digital teachers place a higher premium than the general population of teachers on the value of technology to help them understand their students' needs and adjust their instructional plans accordingly.

Value of games within learning

Specific to the role of digital games to support student learning, the digital teachers continue to emphasize the duality of a changed learning environment for their students with an enhancement of their own effectiveness as a teacher. In keeping with the extensive discussion surrounding the transformative nature of digital content, the teachers who use games in class firmly believe in the power of those games to increase engagement. Five of 10 teachers said they see a role for digital games in helping their students visualize difficult academic concepts.

A transformed learning environment, however, requires that the classroom teacher is leveraging digital content and tools effectively to support that changed classroom paradigm. Again, the cohort of teachers who are using digital games provides guidance as to the key components of that new classroom. As noted in Table 3 for example, while 63 percent of all teachers see a role for digital games in helping them address different learning styles in the classroom, 80 percent of the teachers within our digital games cohort saw that ability to differentiate for different learners as a key benefit of game-based learning. Their first-hand experiences in the classroom with digital games both reinforce and extend the benefits of using digital content to transform teaching and learning.

Five of 10 teachers said they see a role for digital games in helping their students visualize difficult academic concepts.

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USES OF TECHNOLOGY	TEACHERS WHO ARE USING DIGITAL GAMES IN THEIR CLASSROOM	ALL TEACHERS
• Increased student engagement in learning	• **88%**	• **74%**
• Address different learning styles	• **80%**	• **63%**
• Help students reinforce learning	• **62%**	• **49%**
• Provide practice opportunities for students	• **59%**	• **46%**
• Differentiate instruction	• **59%**	• **48%**
• Help students visualize different concepts	• **51%**	• **40%**
• Introduce new concepts within lessons	• **50%**	• **41%**

Impact of digital games usage on student outcomes and teacher productivity

The teachers who are using digital games in their classroom not only think differently about the benefits of digital games but they share a stronger valuation on the overall impact of technology on learning than other teachers do. This finding supports the unique role that digital games play as an entry point for many teachers exploring the use of technology and digital content specifically within instruction. It follows that the digital teachers therefore see the benefits of digital games as resulting in both improved student outcomes and an enhancement of their own personal productivity.

This finding supports the unique role that digital games play as an entry point for many teachers exploring the use of technology and digital content specifically within instruction.

First, the digital teachers are more likely to believe that technology can help them enable a more student-centered learning environment in their classroom (50 percent) that includes more relevant and interactive lessons and learning activities (52 percent). Correspondingly, this teacher cohort also sees a deeper connection between the use of technology within learning and student outcomes such as increased motivation for learning and the development of college and career-ready skills. While many teachers are exploring how to incorporate more technology into their classroom, the teachers who have already implemented digital games have a stronger set of beliefs regarding the impact of these technologies on student outcomes as represented in Table 4.

STUDENT OUTCOMES	TEACHERS WHO ARE USING DIGITAL GAMES IN THEIR CLASSROOM	ALL TEACHERS
• Students are more motivated to learn	• 70%	• 53%
• Students develop critical thinking and problem solving	• 49%	• 38%
• Students develop creativity skills	• 48%	• 39%
• Students take ownership of their learning	• 39%	• 30%
• Students develop collaboration skills	• 37%	• 30%

The linkage between the use of technology and the development of college and career-ready skills such as critical thinking, problem solving, creativity and collaboration is especially meaningful today as schools put a greater emphasis on these types of student outcomes. From the teachers' perspective, students' access to digital games as part of the curriculum supports that increasingly important developmental process.

Second, the digital teachers also see a connection between their use of technology in the classroom and their own effectiveness as a teacher. Over one-third of the teachers in our digital games cohort noted that the use of technology has improved their productivity, helped them more efficiently manage their classroom, provided them with more time to differentiate instruction, and made it easier for them to assess student learning. As research has long documented the importance of teacher effectiveness as a determinant of improved student achievement, the digital teachers' perceptions on how technology has improved their effectiveness is also an important indicator of the value of digital content within the classroom. The teachers' realization of this connection is also evident in their valuation of what constitutes high quality digital content for classroom usage.

Expectations for digital content quality

Traditionally, decisions on what instructional materials are used in the classroom were made at the district office. Increasingly, however, schools and districts are moving some of decision-making on digital content, tools and resources to the classroom, and many teachers as well as librarians and media specialists are now involved with the identification and evaluation of appropriate classroom digital materials. With the plethora of digital resources available for K–12 education today, this is a challenging task. Four of ten school principals noted that this challenge of how to evaluate digital content quality is one of the key barriers holding back greater digital content adoption at their school. The views, therefore, of teachers experienced with effective digital usage in the classroom are a particularly valuable input set for both administrators and teachers tasked with this new decision-making responsibility.

For the experienced teachers who are using digital games within instruction, their evaluation of high-quality digital content equates to three general factors: content source, specific features within the products, and bottom line results expected from the usage. Specifically, the most important determinants of quality digital content for the digital teacher are the following:

1. Content can be modified to meet my classroom needs (73 percent)
2. Content is research-based (53 percent)
3. Content is created by practicing teachers (49 percent)
4. Content is free of commercial advertisements (47 percent)
5. Content includes embedded student assessments (37 percent)
6. Content has been evaluated by practicing teachers (36 percent)
7. Content has been certified by an education association or organization (36 percent)
8. Content has a track record of producing student achievement results (35 percent)

This paper's findings provide valuable background for schools and districts that wish to expand the adoption of digital content for the classroom. The new insights into how teachers evaluate and use games specifically can support the development of a roadmap for actualizing the increased adoption.

PROFILE OF A DIGITAL TEACHER:
Robert Miller, 5th Grade Teacher
Port Orange Elementary School (Port Orange, FL)

For the students in Mr. Miller's class, learning is interactive, relevant, collaborative and fun. So much fun that sometimes his students don't even realize they are learning! Part of that is based upon Mr. Miller's teaching philosophy that emphasizes that students can learn how to learn effectively while pursuing their own curiosities, interests and passions about the world around them. To achieve that, Mr. Miller provides many opportunities within his class for students to work collaboratively with each other and through those collaborative learning experiences to develop the values and life skills essential for participation in a global society.

"My favorite games to use in my class and the ones I see the most value in are simulation games with adjusting variables that provide opportunities for student collaborations. They also provide ways for the students to develop life skills."

Mr. Miller is a tireless advocate for using various digital tools and resources including games to enable these kinds of learning environments for his students. As a result, his classroom is one of the few within his school district to provide students with a personal laptop to use in class. He is also a longstanding **BrainPOP** user and is particularly impressed by BrainPOP's new **GameUp** offerings. His use of one of the GameUp simulation games last year provides an excellent example of how digital teachers are seamlessly integrating digital games into their classroom.

Last March while studying ecosystems and animal habitats, Mr. Miller introduced his class to the GameUp simulation game, **Food Fight**. Food Fight allows students to build a virtual food web as they learn about producers and consumers within an ecosystem. To get started, each student chooses an animal from the African savanna. The objective of the game is to build an ecosystem and make food choices that sustain your animal while depleting the resources for your competitors. The game play is supported with additional BrainPOP resources including movies about food chains, specific animal groups and the savanna.

While the game play provides multiple opportunities for students to develop critical thinking and problem solving skills in addition to knowledge building

about ecosystems and food webs, Mr. Miller took his integration of the game within his class one step further. Since it was March, the class set up a March Madness-type bracket system with the animals to determine the lone survivor. The play lasted over four or five rounds with very high levels of student engagement throughout. As students' animals were knocked out of the competition, those students became coaches for their peers still involved with the game play. The decision-making with the game reinforced the students' understanding of the food chain but also provided real world context for thinking strategically about decisions. Which animal? High prairie grass or high top trees? As Mr. Miller explained, decisions like this can have life or death implications in the game. His students will never associate March Madness with basketball again!

Like other teachers highlighted in this paper, Mr. Miller used digital games to create a learning environment that supported the development of college and career-ready skills, allowed students to take ownership of their learning, and increased overall motivation for the learning process. Don't we all wish that we could be in Mr. Miller's class this year?

"When we get to the place when every student has access to digital content and technology right in the classroom like my students do, then that will be a real game changer for education."

DIGITAL PRINCIPALS:
Supporting digital game-based learning environments at their school

With over one-third of school principals saying that digital games are already helping to transform teaching and learning at their schools, our examination of the views of these digitally supportive administrators is an additional input into helping to understand the digital content adoption process at a school level. Increasingly, district administrators are realizing that the meaningful digital content adoptions are dependent upon a careful balancing of three critical components: appropriate content and technology infrastructure, effective teacher practice, and committed school site leadership. Each of these components is equally important for a successful implementation. The views, therefore, of these digital principals, those school administrators who have a high valuation of digital games, on the benefits of digital content usage, the obstacles to increased adoption, and their expectations for quality products provides new insights to help districts ensure they have a steady third leg for their digital adoptions.

Benefits of digital content usage within instruction

School principals (72 percent) believe that digital content used effectively within instruction will help to increase student engagement in learning. The importance of the connection between the use of digital games and increased student engagement should not be minimized for several reasons. Students articulate that the use of digital games within learning increases their engagement in the learning process. Additionally, over two-thirds of school site administrators (69 percent) identify student engagement level as an effective metric for evaluating the success of technology projects or initiatives at their school. As part of that increased student engagement in learning, the digital principals also note that a significant benefit of digital content

usage is the ability to extend learning beyond the school day (63 percent). School leaders are increasingly interested in how to augment classroom learning; digital content, tools and resources that students can access at home can be the bridge between school-based instruction and student self-directed learning.

Given the emphasis on helping students develop the kinds of college and career-ready skills necessary for future success, digital principals are also interested in the role of digital content in personalizing instruction (54 percent) to meet individual students' needs and increasing the relevance and quality of instructional materials used in the classroom (52 percent). Beyond the direct impact on student' learning, school principals also note that a benefit of digital content usage may be an increase in teacher skills with using technology (49 percent). Given that both district and school administrators continue to identify low teacher comfort, interest and skills with using technology as a key barrier to the greater adoption of not only digital content but mobile devices and online learning in the classroom, the idea that digital content usage can be an entry point for teacher skill development is noteworthy. This perspective by the digital principals is supported by our analysis of the differences in values, attitudes and behaviors of teachers using digital games within their classroom. The implementation of digital content, and more specifically, digital game-based learning environments, may be an effective strategy for introducing teachers to the benefits of integrated technology use within instruction.

Obstacles to digital content adoption

Beyond the perennial issues of teachers' skills with using technology, the digital principals also identify several other obstacles or barriers that prevent them from expanding the use of digital content within their school. The obstacles revolve around three key questions: how to identify appropriate digital content, how to enable usage of that digital content, and what constitutes effective and meaningful usage within instruction. Table 5 relates to the principals' challenges to these key questions.

The obstacles noted by the digital principals are very similar to the same set of obstacles identified by all school principals, indicating the intractability of some of these barriers, even for principals with high expectations for the benefits of digital content usage. This is especially true in terms of administrators' concerns about the infrastructure to support digital content usage, as this has been a top concern for the past three years of the survey findings. Over 70 percent of technology leaders report that if their school or district had adequate Internet connectivity, the use of multimedia digital content including videos within instruction would increase.

Expectations for digital content quality

As also noted in Table 5, digital principals are concerned about how to evaluate the quality of digital content for classroom usage. Like the teachers who are using digital games in their classroom, the principals who support digital game usage represent a more experienced sampling within our administrator ranks and thus, their views on what constitutes quality may be more informed. The digital principals' list of markers for digital content quality is very similar to the digital teachers' list with a few exceptions. Table 6 documents the views of the digital principals on the quality factors and compares those views with the digital teachers'.

TABLE 5

WHAT CHALLENGES DOES YOUR SCHOOL FACE IN IMPLEMENTING DIGITAL CONTENT WITHIN INSTRUCTION?

KEY QUESTIONS	DIGITAL PRINCIPALS' CHALLENGES
How should we identify appropriate digital content?	• Locating appropriate digital content aligned to our curriculum (42%) • Evaluating the quality of digital content products (45%)
How can we enable usage of that digital content?	• Providing enough computers and devices with Internet access for student to use digital content (60%) • Providing enough Internet bandwidth to fully leverage digital content (42%)
What constitutes effective and meaningful usage?	• Balancing time constraints to use digital content effectively (52%) • Concerns about student safety online when using digital content (32%) • Understanding the role of digital content within Common Core or other new state standards (31%)

QUALITY FACTORS	TEACHERS WHO ARE USING DIGITAL GAMES IN THEIR CLASSROOM	PRINCIPALS WHO BELIEVE THAT DIGITAL GAMES ARE TRANSFORMING TEACHING & LEARNING AT THEIR SCHOOL
• Content is research-based	• 53%	• 73%
• Content can be modified by the teacher to meet classroom needs	• 73%	• 61%
• Content includes embedded student assesments	• 37%	• 50%
• Content has a track record for student achievements results	• 35%	• 49%
• Content was evaluated by practicing teachers	• 36%	• 47%
• Content does not include commercial advertisments	• 47%	• 46%
• Content was created by practicing teachers	• 49%	• 41%
• Content was certified by an education association or organization	• 36%	• 31%

For the digital principal, the most important quality marker for digital content is that it is research-based. However, for the teacher, their interest is more practical and pragmatic: they are more concerned with the ability to modify content so that it meets their specific classroom needs. These differences and others noted in Table 5 illustrate the need for schools and district leadership to think about the different perspectives and stakeholder views that are important when implementing digital content. Based upon their vantage point, teachers and principals value different aspects of digital content and this is manifested in their articulations of the benefits and how to evaluate quality. Their bottom line perspective, especially amongst the educators studied in this white paper who are experienced in the use of digital content and digital games in particular, is a shared belief that digital content can engage student learning and empower a transformed classroom experience. With that shared vision for the future, schools and districts can begin to build a new digital learning roadmap for their classrooms.

PROFILE OF A DIGITAL PRINCIPAL:
Tim Lauer, Principal

Meriwether Lewis Elementary School (Portland, OR)

Administrator, instructional leader, budget analyst, motivator, public relations expert, visionary – the many roles that a school principal must play today are varied, challenging and complex. In the case of Mr. Lauer, add in digital learning champion.

Leveraging a longstanding interest in the potential of technology to transform teaching and learning for every student, Mr. Lauer has created a unique school environment in Portland where both students and teachers have the opportunity to experiment with and explore a wide range of digital learning tools and resources. Most recently, his K–5 elementary school has received some new local funding to support a 1:1 mobile device environment with Chromebooks in grades 4 and 5, and a 1:2 environment for students in grades 2 and 3. And for the past four years, Mr. Lauer has supported his teachers' use of Scratch as a way to engage students in learning and to stimulate interest in coding and programming.

Scratch, a free resource from the MIT Labs, is a programming language that students can use to create and share interactive media such as stories, games and animations with people from all over the world. It provides a unique environment for students to learn to think creatively, work collaboratively, and reason systematically. And with the endorsement of Mr. Lauer and his teaching team, the students at Lewis Elementary School are creating their own interactive games using the Scratch visual programming modules. Those learning experiences are resulting in more relevant and engaging learning opportunities throughout the school.

"When I think about an example around the power of games within learning, I think about teaching X and Y coordinates in basic geometry. That can be pretty dry stuff for kids. Yet, as soon as kids get into Scratch and see that it is set up around a grid, it all begins to make sense. They can make the connection between the plot lines on a graph now and how that knowledge can be used create something."

For Mr. Lauer, the real power in technology is when students can create something and share it with others – whether that is a story, an animation or an interactive game. Providing students with an audience for their own creations can be a very powerful learning environment and increasingly, digital tools allow students the opportunity to be both a creator and a reviewer. Moreover, that opens the doors for transforming classroom learning also.

"Traditionally, kids would make a poster and it would stand on a table. Sure, people would see it, but once it was done, it did not change or evolve. With the game creation, it is a continual refinement and modification process for the students as their peers play the game and provide the thoughts on what worked or did not work for them. The student creator can then refine the game and the process starts all over. That learning feedback is really about becoming a lifelong learner."

Mr. Lauer and his team at Lewis Elementary School have overcome some degree of obstacles as they've striven to provide students with digital learning experiences. As noted in this white paper, principals' top challenges with implementing digital content focus on three big questions: how to identify appropriate digital content, how to enable usage of that digital content, and what constitutes effective and meaningful usage within instruction. At Lewis Elementary, it appears that under the guidance of their principal, Mr. Lauer, the school has the right

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mix in place of appropriate digital content, tools that enable the usage, and best practices for engaging and empowering learning. And a futurist digital principal that is enabling this vision to become reality for the Lewis school community.

ENDING THOUGHTS:
The future of digital content adoption

As discussed in this white paper, both teachers and school principals recognize that digital content and games have the potential to transform teaching and learning in our nation's classrooms. In particular, the use of digital games by teachers provides a solid case for how these tools can engage students in learning and help them develop the college and career-ready skills they will need for their future. The teachers also note that the inclusion of digital games within their instructional practice increases their effectiveness in the classroom, a research-proven foundation for improving student outcomes. Despite these positive findings, the adoption process for digital content is still challenging in many schools and districts. Even with the right content in place, and teachers who are interested and willing in exploring different classroom models, every school needs a school site leader to develop the vision and enable the opportunities. The views, therefore, of the school site principals who are already endorsing the use of digital content, and in particular games within learning, provide valuable insights as schools and districts build their internal leadership capacities for digital learning.

While the primary goal of this paper is to provide schools and districts with timely and relevant data to support their planning around digital content adoption, the findings inherently raise new provocative questions about that adoption process. Therefore, it is important to note that the discussion does not need to end here with these final thoughts. Rather, we encourage all readers to ponder the ideas and topics examined in this paper and to reflect on the next steps that are necessary to transform teaching and learning using digital content, tools

and resources. The following questions could be interesting conversation starters at your next school board meeting, administrators' planning retreat, teacher professional development day or even parent association meeting.

- Given that 25 percent of teachers are currently using digital games within instruction, what is the best way to leverage the experiences of those teachers to demonstrate the potential of digital content to improve student outcomes for the other 75%? What types of professional development are the most effective in stimulating and then sustaining interest in using digital content? What types of digital content experiences should be included in teacher preparation programs?

- Both teachers and administrators endorse the connection between digital content usage and increased levels of student engagement in learning. However, are there better ways to measure the impact of digital content on learning beyond engagement? What new metrics should school and district leaders use to evaluate the impact of technology on learning? Specifically, how should we define teacher effectiveness relative to technology usage? Do current rubrics and terminology adequately capture the change the teacher practice supported by digital content?

- With a new national call for increased bandwidth capabilities to schools that is based upon theoretical models, how can administrators determine what their actual school needs are for Internet connectivity adequacy? In addition, can administrators ensure their teachers that their networks have the capacity to ensure a successful implementation of a wide range of digital content types including online textbooks, animated movies and digital games?

- A common mythology today is that there are many high quality digital content resources and that any teacher can use them effectively (and easily) to transform teaching and learning in his/her own classroom. The reality is that despite the plethora of available digital content, it is still imperative that education leaders vet the digital content used at their school and identify upfront the role that they want the digital content to play at their school. What is the best way for a superintendent, principal or teacher to evaluate the quality of digital content? What types of professional development do they need to do this? What are the key markers of quality that every education leader should know?

Whatever the forum for these discussions, the top level question should always be the same: how can we more effectively tap into emerging technologies such as digital content and games to engage and empower new horizons of student learning? Let's start these discussions today.

"The opportunities that technology creates to open doors for students are of the greatest importance. With the ability to become involved in simulations, games and virtual reality environments, students can be exposed to real world applications of the skills they are developing while within our doors. These applications allow students to think creatively while collaborating with their peers in ways we never could have imagined while going through our teacher prep programs."

Curriculum & Instruction Director, Klein Independent School District (Klein, TX)

ABOUT PROJECT TOMORROW

Project Tomorrow is the nation's leading education nonprofit organization dedicated to the empowerment of student voices in education. With 18 years of experience in the education sector, Project Tomorrow regularly provides consulting and research support about key trends in K-12 science, math and technology education to school districts, government agencies, business and higher education.

The Speak Up National Research Project annually polls K-12 students, parents and educators about the role of technology for learning in and out of school, and represents the largest collection of authentic, unfiltered stakeholder voices on digital learning. Since 2003, more than 3.4 million K–12 students, parents, teachers, librarians, principals, technology leaders and district administrators have shared their views and ideas through Speak Up.

ABOUT THE SPEAK UP 2013 NATIONAL RESEARCH PROJECT

In Fall 2013, Project Tomorrow surveyed 325,279 K-12 students, 32,151 parents, 37,756 teachers, 2,230 librarians, 933 district administrators, 3,020 school administrators, 577 technology leaders and 1,346 members of the community representing 9,005 public and private schools from 2,710 districts. Schools from urban (28 percent), suburban (32 percent), and rural (40 percent) communities are represented. Just under one-half of the schools (46 percent) that participated in Speak Up 2013 are Title I eligible schools (an indicator of student population poverty). The Speak Up 2013 surveys were available online for input between October 2 and December 20, 2013.

The Speak Up surveys included foundation questions about the use of technology for learning, 21st century skills and schools of the future, as well as emerging technologies (online learning, mobile devices and digital content), the use of technology within specific curricular areas and STEM career exploration. In addition, educators shared the challenges they encounter integrating technology into classroom instruction, and how budget challenges have affected these decisions. The data is collected from a convenience sample; schools and districts self-select to participate and facilitate the survey-taking process for their students, educators and parents. Any school or school district in the United States is eligible to participate in Speak Up. In preparation for data analysis, the survey results are matched with school-level demographic information, such as Title I status, school locale (urban, rural, and suburban) and ethnicity selected from the Core of Common Data compiled by the National Center for Education Statistics (http://nces.ed.gov/). Speak Up data is cross-consulted with NCES statistics to ensure that data represents nation-wide school demographics. The data is analyzed using standard cross-tab analysis.

ABOUT BRAINPOP

BrainPOP (www.brainpop.com) creates animated, curricular resources that engage students, support teachers, and bolster achievement. Used in classrooms, at home, and on mobile devices, its award–winning offerings include BrainPOP Jr. (K–3), BrainPOP, BrainPOP Español, and, for English language learners, BrainPOP ESL. It is also home to GameUp, a curated collection of leading learning games designed to support game-based learning. BrainPOP offers teachers a rich collection of professional development opportunities, implementation tools, and lesson plans to meet the rigor of the Common Core and other academic standards. BrainPOP web sites and mobile apps support individual, team, and whole-class learning. Localized to major world languages, its sites host millions of monthly visitors, and its mobile learning apps regularly rank among the highest in the major app stores' education categories.