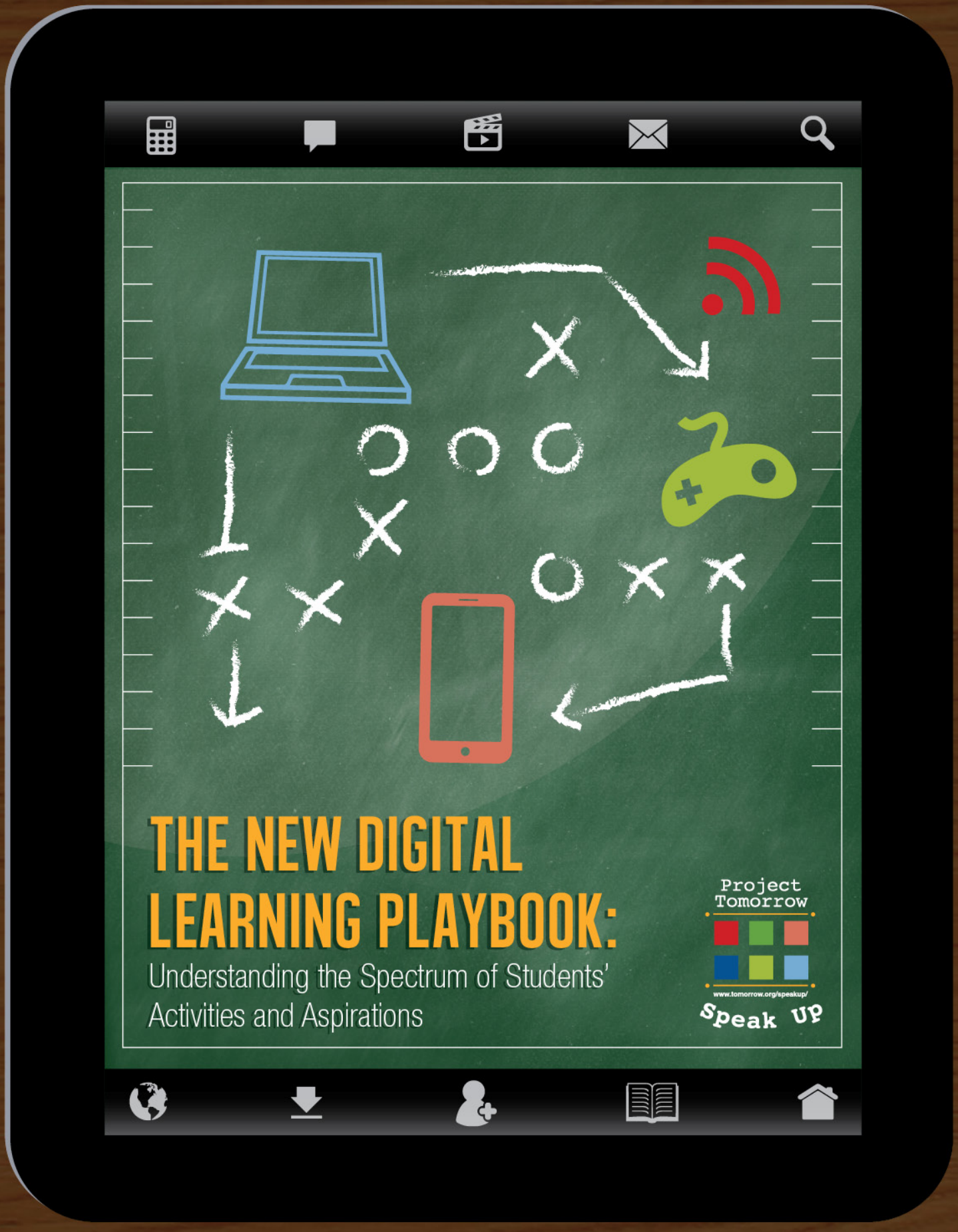


Speak Up 2013 National Findings from K12 Students

Introduction

Anthropologists have long studied the role that mythology plays in the cultural fabric of a community. According to these social scientists, various cultures use myths as a form of storytelling to provide an explanation for a changing or confusing world, to validate existing beliefs, to fill in gaps of knowledge or understanding, and to establish a sense of order amongst chaos. Myths often are also used to inspire awe and wonder amongst the community. While the excitement of the myth story is contagious, the awe and wonder is not intended to stimulate scientific questioning or inquiry, but rather to maintain a status quo of order or power. Such is the case for example with the traditional Navajo myth about the creation of the constellations. As the story is told, the Sun and Moon were made from cutting giant discs of quartz that were then hoisted into the sky to provide light to the Navajo people, both during the day and at night. Not wanting to be wasteful, the creation deity used the remnants of the quartz cutting process to create patterns of stars in the night sky that had an explicit function of explaining the community's laws. While the myth provided the Navajo people with an awe-inspiring explanation for how the Sun, Moon, and stars were created, it also sought to establish a cultural order within the community, as the medicine men were the only ones recognized with the wisdom to interpret the constellation-based laws.

In a similar way, the education community has used anecdotal stories over the years to understand or make sense of the role of technology within the lives of today's K-12 students. These stories have developed into a comprehensive mythology around student digital learning that closely mimics the role of myths within other cultures. The unprecedented pace of the infiltration of technology tools and resources within our daily lives has created a need, especially for adults, to create a new sense of order within education, and to fill in gaps of knowledge and understanding around the use of technology with overly simplified explanatory narratives.

One of the most popular explanatory narratives as it relates to the use of technology by students has been the digital native storyline. Following the tenets of mythology, the digital native storyline seeks to bring order to the ever-changing education universe by simply stating that all students are naturally tech-savvy and know how to use digital tools to support learning, and educators and parents will never be on par with student skill levels because of their status as digital immigrants. Cofounding a key element of the digital native myth, however, the Speak Up National Research findings have long documented that not all students view themselves amongst the techno-elite in terms of their own skills. In addition, the students' self-assessment of their technology skills, and the gender gap in this self-assessment, has bearing on their use of various digital tools for learning and aspirations for digital learning environments as will be further discussed in this report.

In many ways, this digital native – digital immigrant myth however has allowed education leaders to provide a simplified explanation as to why there continues to be a disconnect between students and adults on the importance of digitally based learning, and to provide justification for the current status quo on technology use within learning. This oversimplification of the environment also sets up multiple opportunities for education and business leaders to use anecdotal stories to illicit awe and wonder about students' technology use. In 2003, the first year of the Speak Up surveys, education, business, and policy leaders marveled at how middle school students were providing in-classroom technology support to their teachers and starting home businesses to create websites for local companies. Today, that astonishment is focused on student-developed mobile applications (or mobile apps) that are selling in the iTunes or Google Play stores. While stories such as this make for interesting copy, focusing on the awe and wonder of selected student technology use stands in the way of understanding how technology can be used, both in school and out of school, to improve student learning opportunities. The mythology of the digital native also blurs the

picture for appreciation how to leverage digital tools and resources to personalize learning for every student as it continues to promulgate a view that "one size fits all" for every digital native.

It is time to move beyond the mythology of students' technology use with a new digital learning playbook, a new constellation of stars as such, that recognizes and appreciates that there are differences amongst K-12 students in their use of and aspiration for using technology to support their learning. For the past eleven years, Project Tomorrow's® annual Speak Up National Research Project has provided schools and districts nationwide and throughout the globe with new insights into how today's students want to leverage digital tools for learning based upon the authentic, unfiltered ideas of students themselves. With this year's national report on the views of 325,279 K-12 students representing over 9,000 schools and 2,700 districts nationwide, we focus on getting beyond the anecdotally- driven stereotypes of student technology use to establish a more comprehensive understanding of the myriad of different ways that students are currently personalizing learning using technology. Given the increasing interest amongst education, business, policy, and parent leadership on the value of digital tools to personalize learning and improve student outcomes, this year's report provides new findings around these three central questions to further both national and local discussions:

- How are K-12 students currently using digital tools and resources to *support schoolwork activities?*
- How are K-12 students currently using digital tools and resources to *enable out of school time learning activities?*
- What are K-12 students' aspirations for using digital tools and resources within *new innovative learning environments?*

Understanding that the traditional "one size fits all" digital learning plans usually fit none, the lenses for this year's data examination include student grade, gender, self-assessment of technology skills, Title 1 designation (often used as an indicator of the level of home poverty), and community type (urban, suburban, or rural) to both dispel sustained myths and to inform innovative ways to provide greater equity within our learning environments.

Moreover, as a microcosm of how students' are approaching living and learning from different perspectives within today's digital universe, we are also providing in this year's report new findings around students' interest in STEM (science, technology, engineering, and math) careers and how students want to embrace both traditional and digital paths for career exploration.

In addition to bringing order to a changing or confusing world, myths also can serve as cultural artifacts that allow us to see an evolution of thinking over time. New phenomena often present opportunities to revisit long held assumptions or beliefs. The Navajo story of the creation of the stars may have needed some revisiting whenever a meteor streaked across the night sky. In a similar way, understanding how today's students are using technology for learning, both in school and out of school, and their aspirations for new digital learning experiences can be one of those meteor opportunities for our nation's education leaders. Let's grab on to that meteor tail and leverage the authentic views of our students to create new digital learning playbooks that will meet the needs of all of our diverse learners.

"I use technology to inspire myself. I watch TED talks, blog, and read fanfiction. Technology empowers us and gives us the ability to nourish our imagination and fill us with inspiration. I use the successful ideas students from around the nation tell me about and incorporate it into our own school. Technology has been a big part of my life, I bask in the information it presents me with from simple how to videos to solving differentiated equations."
(Girl, Grade 12, Perris, California)

Play #1: How are K-12 students currently using digital tools and resources to support schoolwork activities?

Teacher-facilitated Technology Use

When discussing student technology use to support schoolwork, the general assumption is that we are talking about teacher-sponsored, classroom-structured 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 as noted in Table 1 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 using a mobile device provided by their school to support schoolwork.

Table 1: Students' Use of Teacher-Facilitated Technology in the Classroom

Digital Activity	Elementary School Grades 3-5	Middle School Grades 6-8	High School Grades 9-12
Access class information through online portal	31%	68%	75%
Take tests online	44%	47%	52%
Use online textbooks	14%	32%	37%
Use a mobile device provided by school	25%	30%	32%
Watch teacher created videos	14%	22%	22%

Since these types of learning activities intentionally require teacher sponsorship, school support, or district policy, the student experience with these activities is not dependent upon their gender or self-assessment of their technology skill level. As with traditional learning tools such as print textbooks, there is a universality of the access amongst students when the tools are teacher facilitated in the classroom. This data illustrates the acclimation of teachers to using technology in their classroom than providing new insights into student usage. For example, only 32 percent of middle school students said that they were taking tests online in 2009. Teacher facilitation of online tests in middle school classrooms has increased by 47 percent in four years, a strong statement about both the availability of online tests within curriculum and teacher adoption of those tools for assessment purposes.

Student-initiated Technology Use

Differences also emerge in how students are adapting various digital tools and resources to self-support their schoolwork activities beyond teacher sponsorship. In previous Speak Up reports (http://www.tomorrow.org/speakup/speakup_reports.html) the data has demonstrated that students are not just adopting new technologies to use within learning, but they are actively manipulating and modifying standard uses for

the digital tools to meet individualized learning needs. We see in this year's data that this is especially true for students who assess their technology skills as advanced compared to their peers. Also noteworthy is that since many of the digital tools that students are using to self-initiate schoolwork assistance are socially based tools, girls are outpacing boys in that usage as illustrated in Table 2.

Table 2: High School Student-initiated Use of Technology to Support Schoolwork

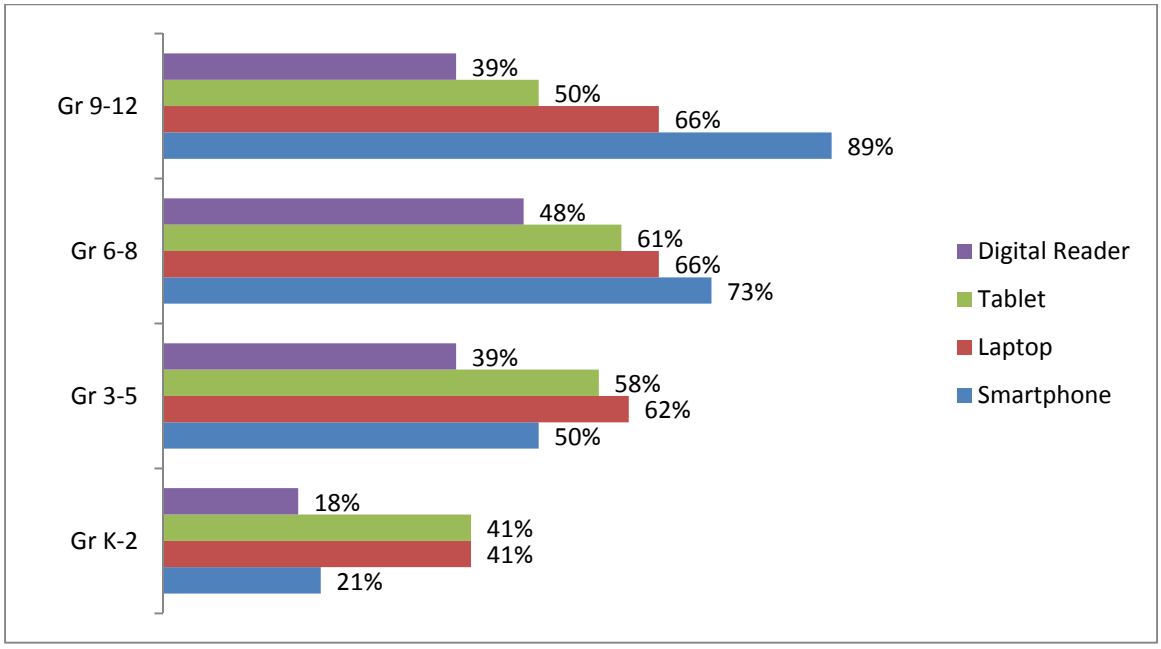
Digital Activity	Girls		Boys	
	Advanced Tech User	Average or Beginner Tech User	Advanced Tech User	Average or Beginner Tech User
Text with classmates	75%	73%	66%	60%
Take photos of assignments using mobile device	57%	49%	44%	35%
Find videos to help with homework	51%	41%	43%	32%
Use Facebook to collaborate on projects	43%	35%	33%	24%
Skype or iChat with classmates	36%	28%	33%	21%

The data reveals new findings about variances in self-initiated technology use by girls and boys. While mythology may state that texting is pervasive for all students, the data demonstrates that while almost three-quarters of high school girls across all levels of tech-savviness say they regularly use text messaging to communicate with classmates about schoolwork, significantly fewer males are doing the same. Girls are generally also outpacing boys in their use of Facebook and other social networking sites to collaborate on school or class projects, supporting the idea that the presence of social media tools trumps technology skill level. Student's self-assessment of their technology skills also has bearing on some of the types of digital activities they do to support schoolwork. Girls that consider themselves advanced tech users are more likely to use their mobile devices to take photos of class assignments or find online videos to get homework help than boys that also assess their skills as advanced or even other girls.

Mobile Devices for Schoolwork

In many ways, the new gateway to self-initiated technology use for schoolwork is the mobile device. Increasingly, students have access to tablets and laptops to use both at school and at home for learning purposes. In some cases, parents are providing these devices to enable their children to have access to high quality digital content and be able to extend the learning process beyond the school day. In this year's Speak Up survey for parents of school-aged children, almost two-thirds of parents (64 percent) said they would purchase a mobile device such as a tablet or laptop for their child to use at school, if it was allowed. A similar percentage of parents (61 percent) said their preference is for their child to be in a class where they could use their own mobile device. It is not surprising given the increased access that K-12 students have to personal mobile devices (Chart 1) that students across all grades identify "not being able to use my own mobile device in school" as an obstacle to school technology use. Girls appear to be especially frustrated by school policies that limit mobile device usage as well as social media tool access. A majority of middle school girls identified that not being able to use their personal mobile device (55 percent) as a major barrier to school technology use.

Chart 1: K-12 Students' Personal Access to Mobile Devices



Many Title 1 schools are making a significant effort to level the playing field for their students by providing mobile devices for use at school and at home. Over a quarter of high school students in schoolwide Title 1 schools said that they have a school provided tablet to use for schoolwork, compared to 13 percent of high school students in non-Title 1 schools. Similarly, 24 percent of students in grades 6-8 and 22 percent of students in grades 3-5 in Title 1 communities also are assigned a school tablet. Administrators from Title 1 schools appear to have a greater appreciation for the potential benefits of out of school access. While 26 percent of elementary students in non-Title 1 schools say they have a school provided tablet to use, only 3 percent of those students can take that tablet home to extend their learning. Comparatively, of the 22 percent of elementary students with a school provided tablet in Title 1 schools, 10 percent are allowed to use that tablet at home.

By using school provided tablets within their learning activities, students in Title 1 schools are experiencing changes in their expectations for academic mobile device use . When asked to identify the best device for various academic tasks, the high school students were more likely to select a tablet than their peers in non-Title 1 schools. Four out of ten of these students said that their preferred mobile device to do Internet research, access an online book, watch a video for schoolwork, and take notes for class would be a tablet, whereas less than one-third of the non-Title 1 students had that same preference. This differentiation supports both the investments that Title 1 schools are making in mobile devices and the idea that students' first hand experiences with using digital tools within a learning context can drive greater usage.

Digital Writing and Reading for schoolwork

Two important new components of students' self-initiated technology use for schoolwork are digital writing and reading. Again, it is important for education and policy leaders to get beyond their assumptions on students' level of writing and reading in order to appreciate a new role for digital tools to support skill development in these key areas. Despite mythology to the contrary, today's students are spending a significant amount of time doing digitally based writing. As is often reported by English teachers, frequency of writing is a good first step to improved fluency of

writing. High school students reported a mean average of 14 hours per week using technology for writing. High school girls are especially outpacing their male peers in their amount of writing time (15 hours per week compared to 13). Amongst students who self-assess their technology skills as advanced, statistical testing also indicates a significant gender difference in their writing time with girls spending 17 hours in various writing exercise and boys writing on average 15 hours a week. The types of digital writing these advanced technology users are doing regularly for schoolwork is representative of the variety of ways that students today are interacting with digital media and online social sites (Table 3). The data also demonstrates varying contexts for writing between girls and boys. For example, boys are twice as likely as girls to be writing text within an online conversation on a gaming website.

Table 3: High School Students' Digital Writing Activities (Advanced Technology Users)

Digital Writing Activities	Girls	Boys
Essays and school reports	75%	60%
Email	58%	49%
Creative writing, journaling and poetry	46%	31%
Captions for photos	40%	26%
Instant messaging or online chats	39%	30%
Text for social media sites	36%	26%
Blogging	31%	20%
Text for multi-media presentations	31%	24%
Tweets	31%	22%
Gaming conversational text	14%	28%
HTML coding	14%	19%

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Just as it is important to recognize and appreciate how today's students are tapping into digital tools to support their schoolwork writing, it is equally valuable to understand students' preferences for digital reading. While the debate over print vs. pixel continues to perplex policymakers, especially those involved with the new online assessments, students are increasingly choosing digital text over printed text for both schoolwork and personal reading. One-third of middle school students say that for schoolwork reading their preference is to read digital materials rather than printed materials, and 51 percent believe that online textbooks should be an essential component within future schools.

How students are using digital tools to support schoolwork is valuable input for education leaders that are creating new game plans for digital learning within their schools and districts. However, the story is only partially written if our leaders do not also pay attention to how today's students are using digital tools outside of school. For today's students, learning is a 24/7 enterprise with the traditional school day being only a small part of the overall time that students spend learning, especially using technology.

"I play games that develop critical thinking skills and analysis of situations. I play strategy games that are involved, complicated, and a real challenge. I learn about things that I am interested in by internet research and I have learned much about what I want to do and what areas I am interested in. I like this learning style because it teaches me about what I want to know and helps to make me more prepared for a job in a field that I am interested in.
(Boy, Grade 9, Jacksonville, Florida)

Play #2: How are K-12 students currently using digital tools and resources to enable out of school time learning activities?

Social Media

The almost daily emergence of new social media sites and applications in the marketplace is reflected in the changing profile of middle and high school students' use of social media tools outside of school. Students this year continue to report less regular interaction with traditional social networking sites such as Facebook. Only 30 percent of middle school students and 39 percent of high school students now say that they are maintaining a social networking site, a decrease of approximately 40 percent since 2009. In its wake, social media apps such as Instagram, Snapchat, and Vine are filling in the void with participation by 44 percent of students in grades 6-12. Twitter is also becoming a preferred digital medium for communications and information for many students including 28 percent of high school students. Other popular social media tools include:

- Text messaging (two-thirds of students in grades 6-12 text, an increase of 37 percent since 2008)
- Video creation and posting (28 percent of middle school students)
- Blogs (a quarter of students follow favorite blogs, 12 percent have their own blog)
- Stream online TV shows (38 percent of middle and high school students)
- Massively multi-player online games (23 percent of middle school students play regularly)

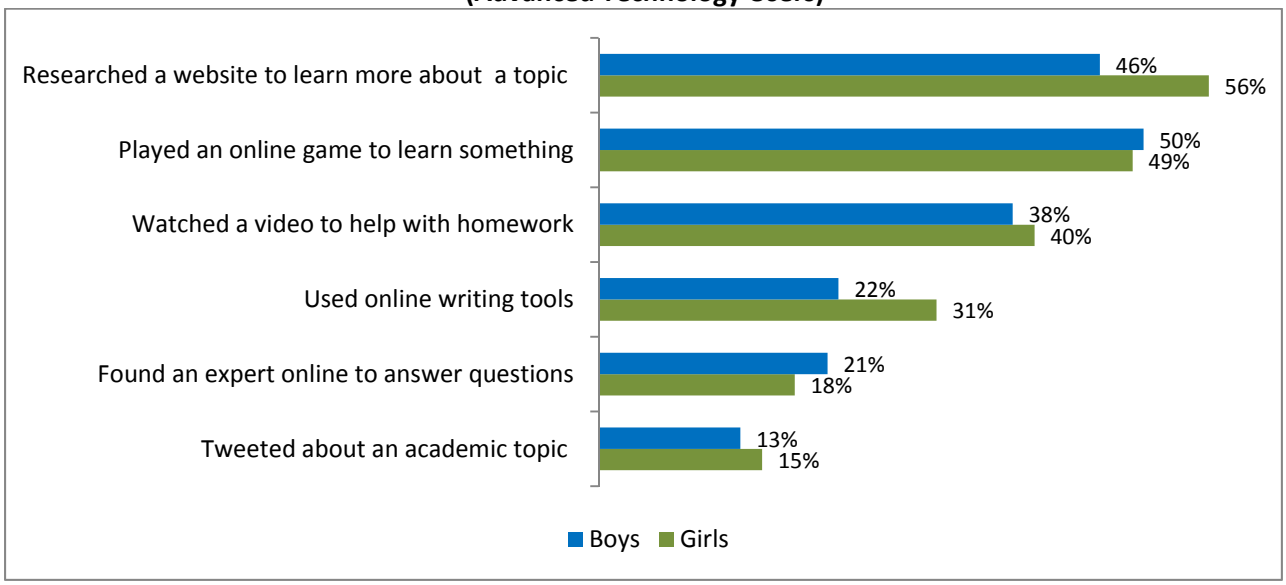
Digital Games

Of the various social media tools, the role of digital games has strong implications for understanding the importance of students' out of school learning experiences. Foremost, the traditional gender gap between girls and boys in digital game playing has largely evaporated when examining students' use of tablets and smartphones for games. Approximately 42 percent of girls in grades 3-5 and 37 percent of girls in grades 6-8 say that they are regularly playing games on tablets; within the same age groupings, 38 percent of boys are using tablets for digital gaming. A similar pattern exists with smartphone-based game playing with slightly more than one-quarter of boys and girls in grades 3-5 using this medium for their digital play and 45 percent of middle school girls and boys. However, participating in massively multi-player online games (MMOGs) is definitely an activity favored by boys, especially middle school boys who self-identify their technology skills as advanced. Amongst that group, 42 percent say they are regularly participating in MMOGs. Even within the group of girls with advanced tech skills, only 26 percent are MMOG players. A key component of the MMOG play is the social interaction with other players who share a similar passion for the game topic or activities. And while girls are traditionally more interested in group or collaborative projects, a larger percentage of tech-advanced middle school boys (44 percent) than girls (37 percent) see these digital games as a way to learn how to work in teams.

Girls and boys across all grade levels see digital games as having significant learning benefits if employed within a school environment, including greater engagement in learning and making it easier to understand difficult concepts. While approximately 25 percent of classroom teachers are integrating digital game activities into their instructional plans, some students are already tapping into online games outside of school to support their self-directed interests in academic topics. Approximately one-quarter of middle school students have played an online game outside of school on their own, specifically to learn something. The percentage jumps to almost 50 percent amongst boys and girls who consider their technology skills advanced (Chart 2). As discussed in previous Speak Up reports, and

documented by these new findings, a new student profile is emerging. We call these students *Free Agent Learners.* This student is characterized by their use of a wide array of digital tools and resources to self-direct learning outside of school around topics that are of high interest to them. While some mythology may point in the direction of boys as more self-directed in their technology use, the latest Speak Up data indicates very little variance between Free Agent Learning girls and boys who self-assess their technology skills as more advanced than their peers.

Chart 2: Middle School Students' Use of Digital Tools for Self-Directed Learning Outside of School (Advanced Technology Users)



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Digital Footprints

Defined as the norms of appropriate and responsible behavior with technology, digital citizenship is becoming a highly valued skill for today's students by both educators and parents. As digital learning is becoming more pervasive in K-12 classrooms with digital games, mobile devices, and online textbooks and curriculum, administrators are increasingly noting student safety and online behavior as concerns associated with expanding technology use in school. Within the larger arena of digital citizenship, what students are posting online about themselves (their digital footprint) is particularly vexing for parents. Two-thirds of parents of school aged children (66 percent) noted this as a primary concern— for the first time, at the same level of concern as online predators.

As with many other findings in this report, students' views on the digital footprints that they are leaving behind on social media sites and through online interactions may surprise both educators and parents. While girls appear to be acting more carefully than boys in terms of what information they are sharing about themselves, students overall have very consistent views on their awareness of this issue, the actions they are taking, and the actualization of a positive digital footprint. Table 4 provides a summary of the views of high school students disaggregated both by gender and community type.

Table 4: High School Students' Views on their Digital Footprint

Digital Footprint Actions	Gender		Community Type		
	Girls	Boys	Urban	Suburban	Rural
I am careful about posting and texting information about myself or others	52%	41%	46%	44%	48%
I have advised friends to not post certain things about me or others	34%	25%	30%	28%	30%
I have stopped interacting with someone based upon their online profile	29%	20%	24%	23%	26%
I use digital footprints to find people to connect with	12%	12%	13%	12%	12%
I think it is important to have a positive online profile	38%	27%	32%	31%	33%

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The similarities in student views regardless of community type should be particularly interesting to parents and educators who may overestimate the role of cultural influences on students' technology use. It may also be informative for adults who have bought into the myth of the shared experiences of all digital natives to know that 25 percent of all girls and boys, as well as urban, suburban, and rural students, say that they do not regularly post information about themselves online. With the ongoing development of new social media and online sites, this topic of student views and actions associated with their digital footprint is a new and emerging field of study. As students continue to stretch the boundaries of learning beyond the classroom and into online spaces, it is important for both education leaders and parents to recognize the importance of relevant and timely digital citizenship development in their new digital learning playbooks for schools.

Out of School Internet Access

As noted in this year's findings, students are creatively tapping into social media, games, and videos on their own to extend the learning process beyond the end of the school day. And while we may unintentionally fall into the "awe and wonder" entrapment of some of these findings, it is vitally important that we also recognize, as many of our school and district leaders do each day, that not all of our K-12 students have access to the Internet outside of school. This fact is an especially poignant one for Project Tomorrow given our roots as NetDay, the nationwide school wiring initiative of the 1990s. New private-public initiatives are focusing on increasing both home and school access to high speed, broadband Internet but in the meantime, our education leaders representing all types and sizes of districts are facing serious equity challenges. Amongst district technology leaders, 46 percent identified digital equity issues such as providing students with access to the Internet beyond the school day as one of the most challenging issues they are facing today. Comparatively in 2010, only 19 percent of those technology leaders ranked digital equity as a key challenge. As online classes and digital textbooks become mainstream tools within a teacher's instructional plan, it is increasingly imperative that we develop new strategies for providing students with out of school time Internet access. Step one in building that part of the new digital learning playbook is to fully understand the extent of the challenge and how today's innovative students may be piloting a new solution for us to consider.

The following series of charts document the access that high school, middle school, and upper elementary students have to the Internet, comparing students in Title 1 schools with non-Title 1 schools. While the findings on the differences in home access support other data and popular perceptions, the students' reporting of their primary access as through a mobile device may illuminate some new solution pathways.

Chart 3: Students in Grades 3-5 Internet Access

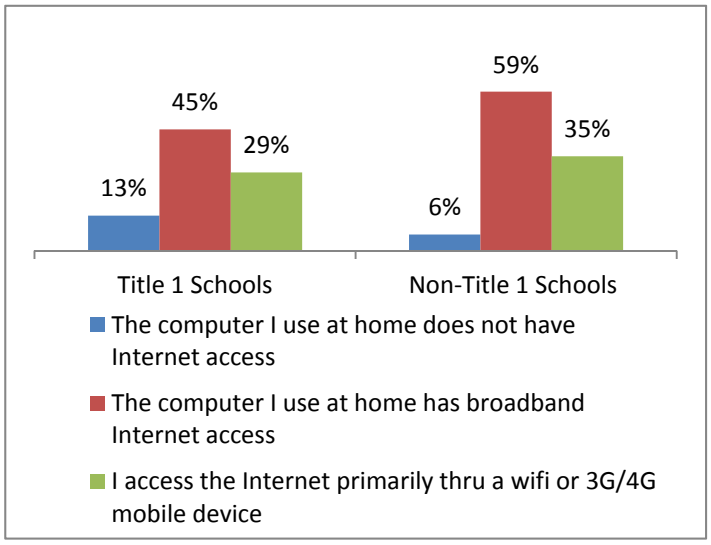

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Chart 4: Students in Grades 6-8 Internet Access

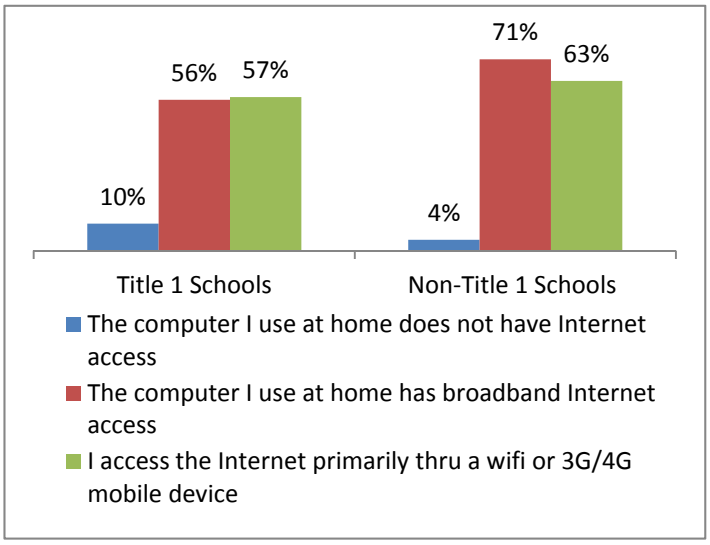

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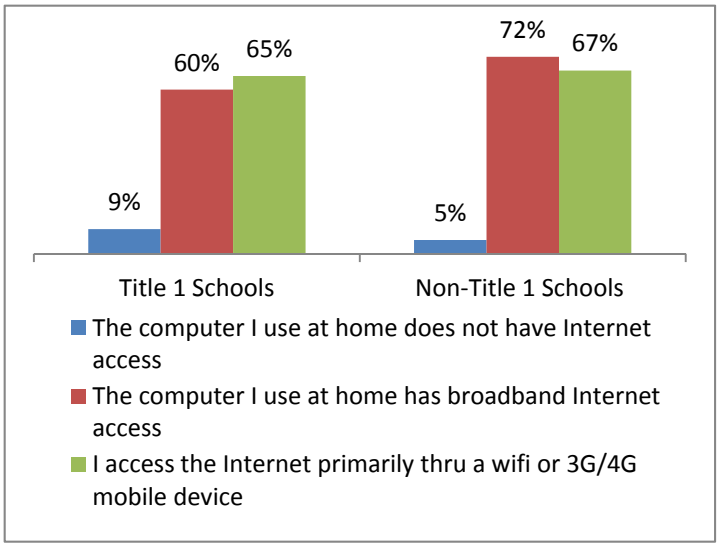
Chart 5: Students in Grades 9-12 Internet Access



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The availability of lower cost and more fully featured mobile devices with Internet access including smartphones and tablets is changing the prospects for increasing student access outside of school. Additionally, as noted earlier, many Title 1 schools administrators are providing their students with mobile devices such as tablets and specifically allowing students to bring those tablets home for extended use beyond the school day. When we examine both the hard wired type of home Internet access alongside wifi-enabled devices and 3G/4G connectivity options, we see that not only does the mobile device empower student access but it also enables students to have a personal device that is not necessarily shared with siblings and parents when broadband access is limited to only one family desktop computer.

Using mobile devices, today's students are paving new territory in terms of when and how to use technology for learning. These experiences are in many ways acting as catalysts for their aspirations for the development of new innovative learning environments.

"I'm always inspired to look up new things because of the world around me. If I see something on the news that perks my interest, I'm immediately on my iPhone trying to learn as much as I can about it. If I see somebody doing something that looks cool, I'll look it up so I can see it and learn how to do it."
(Girl, Grade 10, Dayton, Ohio)

Play #3: What are K-12 students' aspirations for using digital tools and resources within new innovative learning environments?

Improving School Technology Use

When asked how their school could make it easier for them to use technology to support learning, students' responses closely match the way they are already using digital tools outside of school for learning. In general, K-12 students want greater alignment between their out of school learning and their in school learning. This often includes greater access to online sites, use of mobile devices and social media, and digital tools that help to facilitate collaboration, communications, and self-organization. Additionally, students would like to have extended access to their teachers or online tutors to support their learning. This particular "ask" from students validates the importance that today's learners place on the role of the teacher within their educational lives; debunking another myth that today's students do not value a teacher relationship. Table 5 provides a comparative view on the aspirations of middle school and high school students for how their school could make it easier for them to maximize technology for schoolwork. In many cases, these technology use solutions involve local policy decisions that could be changed by a school principal in response to student needs.

Table 5: Students' Ideas for Improving Technology Use at School

Improved Technology Use Solutions	Students in Grades 6-8	Students in Grades 9-12
Allow greater access to websites I need for learning	63%	68%
Let me use my own mobile device	55%	51%
Let me recharge my mobile device at school	42%	43%
Provide schoolwide Internet access	46%	42%
Provide access to my social media tools	35%	39%
Provide me with tools/apps for organizing my schoolwork	39%	31%
Provide access to an online tutor	26%	30%
Provide 24/7 access to my teachers	28%	28%
Provide me with tools/apps to facilitate collaboration with classmates	35%	28%
Provide me with a mobile device to use at school (if I cannot use my own)	33%	21%

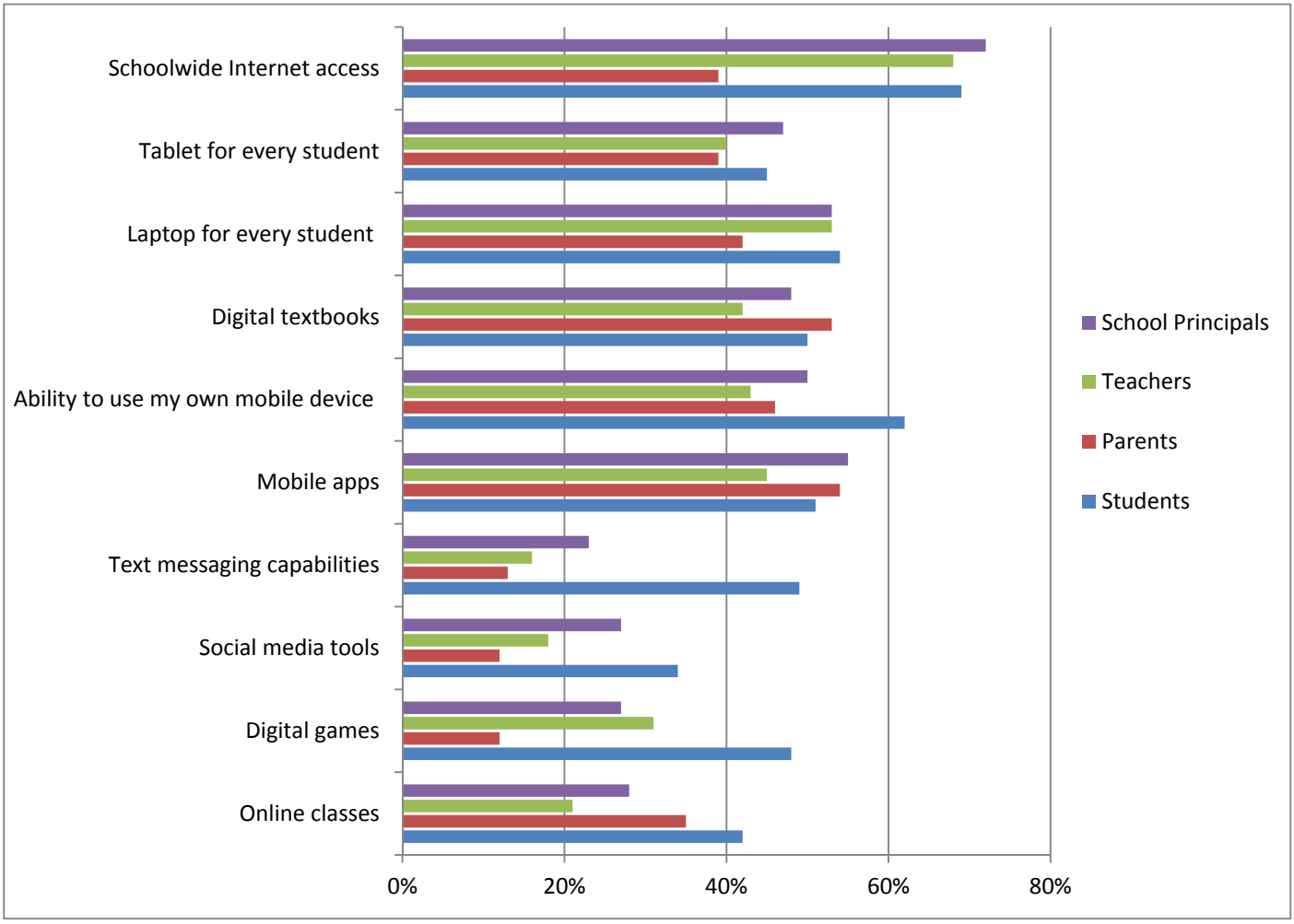
Envisioning the Ultimate School

While Table 5 documents students' perspectives on how to improve the existing technology use at their school, the Speak Up surveys also annually ask students to envision their ultimate school, to dream big about how digital tools and resources could provide them with a transformative learning environment that highly values personalized learning for every student. Students' top ten list of the essential digital tools and resources for this visionary school

captures all of the key technologies discussed in this report. Most importantly, all of the subgroups we studied including different grade bands of students, girls and boys, students from urban, suburban, and rural schools, students in Title 1 schools, and students who self- assessed their technology skills as advanced all share the same top ten list. When it comes to articulating a digital learning future, today's students share a unique bond with each other based upon shared experiences both in school and out of school that has created a common vision for the future.

The views of their parents, teachers, and school principals obviously reflect their worldview on the potential of various technologies to support learning. As with the students, the tools the adults have used in their personal or professional lives may influence their perspective on the value of these technologies within the ultimate school. The contrast between the top ten list of the students and how the adults ranked those same digital tools is demonstrated in Chart 6.

Chart 6: Do We Have a Shared Vision of Digital Learning?



Though the students' vision for their ultimate school includes the same top ten elements for each subgroup that we studied for this report, the level of interest varied to some degree within the student cohorts. For example, while girls had higher levels of attraction to mobile learning tools (tablets, laptops, mobile apps) than boys, the boys' interest in games outpaced the girls' value proposition on that digital activity. Of the three community types (urban,

suburban, and rural) students from rural communities also expressed stronger levels of interest in each of the top ten tools than their peers in suburban or urban areas.

This comparative analysis of what technologies would be essential in an ultimate school for today's learners also underscores two key findings from this year's Speak Up data. First, students' aspirations for new learning environments are not predicated on access to one tool or a singular set of resources. Providing students with a laptop in itself does not constitute the ultimate school for today's learners. Rather, students have a vision for that ultimate school that encompasses having access to a wide variety of digital tools and resources and the ability to leverage the features and functionalities of those technologies to communicate, connect and collaborate with peers, teachers and experts both at school and at home. The ultimate school for today's student is one where learning is:

- socially-based through their ability to access social media tools and online classes,
- un-tethered from traditional print and location based resources via schoolwide Internet access and mobile technologies, and
- digitally rich, to add context and relevancy to the learning process through the use of digital creation tools and interactive online content.

One size does not fit all even within the ultimate school. Thus, today's students also see their ultimate school as a place where they can use these emerging digital tools in highly personalized, self-directed learning activities to address individualized academic interests and ways of learning.

The second key finding is that the adults in students' academic lives (their parents, teachers, and school principals) do not share a coherent vision of the ultimate school, and that their individual rankings of the various technologies in most cases are not in alignment with the student rankings. Ability to use a personal mobile device at school, digital games, and access to text messaging all rank significantly higher on the students' top ten list than the lists of parents and educators. These three tools in many ways represent the holy trinity of the student vision for digital learning – using socially-based digital tools to facilitate un-tethered learning experiences that are rich in interactive digital content. Conversely, school principals place a higher premium on the value of tablets and mobile apps within the ultimate school than the students do themselves. This does not mean that students are less interested in tablets. Rather the student vision of the ultimate school is not fixated on the need to identify one all-encompassing mobile device to use within instruction. Students see tablets, laptops, digital readers, and even their own smartphone all as tools that have utility for certain academic tasks and should be included as available resources within the ultimate school. As education leaders create new digital learning playbooks for their schools and districts, bridging the disconnect between the students' vision of new innovative learning environments with the divergent and often conflicting views of parents and staff should be a fundamental first step.

Outside of school I am using technology to better prepare myself academically, by training myself to find answers to my questions. This helps me self-teach myself to better myself for my classes. I also look to read articles on the internet about new and arising issues, so I can be socially aware, it is something that I view as extremely important. I use my smartphone, along with my laptop computer to access my technological needs for me to succeed in the future.
(Girl, Grade 10, McAllen, Texas)

Final Play: Students, digital learning and their future career choices

In sports, field plays are first envisioned in the abstract, and then revised during the game or match to reflect the reality of game situations and field conditions. In a similar way, the development of technology plans within schools and districts is often first a conceptual exercise focused on how to most effectively utilize various tools and resources. One way to instill context and relevancy into new digital learning playbooks is to examine the interplay between students' use of digital tools and their expectations and explorations around future careers, most notably in STEM fields. Given this year's report emphasis on the differences amongst digital learners in their activities as well as aspirations, this examination is particularly informative for schools, districts and communities who are interested in widening the pipeline for a more varied set of students to pursue STEM careers.

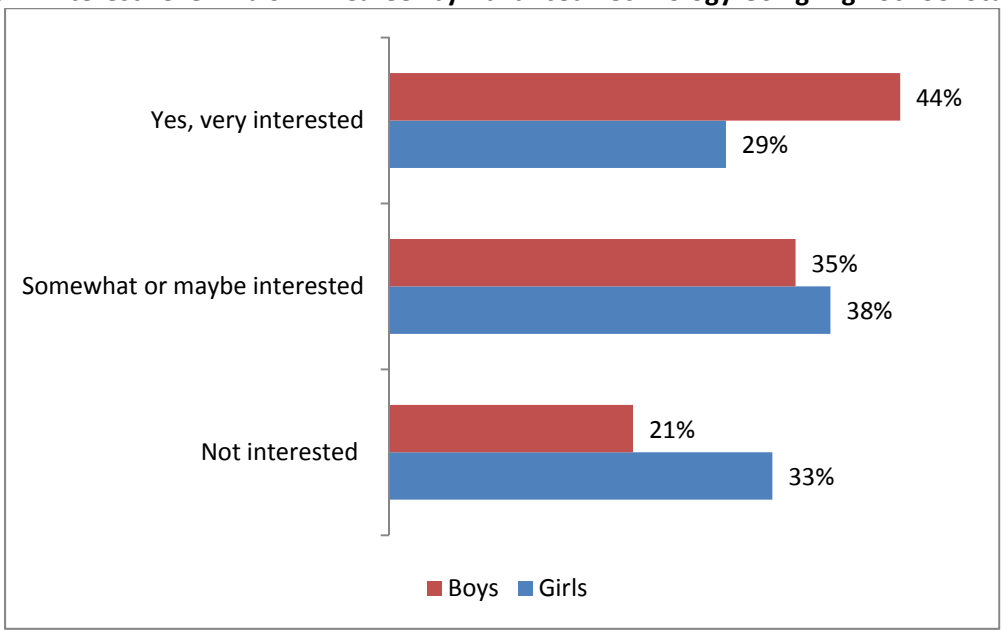
As noted with other findings in this report, students' self-assessment of their technology skills compared to their peers is correlated to their interest in the use of various digital tools. Additionally, we noted in this report various gender specific differences in how students wanted to use technology both in and out of school. The combination of these two factors, student technology skill assessment and gender, results in a clear picture on the genesis of one of the key issues facing our national economy, the lack of girls' interest in STEM careers. As noted in Table 6, from kindergarten through 12th grade, the gap between boys and girls in their self-assessment of their technology skills grown from 6 percentage points to 15. Thus, as girls advance through their traditional school environment, they are more likely to re-evaluate their technology skills as average, while boys' opinion of their technology skills as advanced remains constant.

Table 6: Students' Self-Assessment of their Technology Skills

Skill level compared to peers	K-2 Girls / Boys	Gr 3-5 Girls / Boys	Gr 6-8 Girls / Boys	Gr 9-12 Girls / Boys
My skills are advanced	26% / 32%	20% / 30%	18% / 30%	17% / 32%
My skills are average	53% / 49%	65% / 57%	77% / 64%	79% / 63%
My skills are beginner level	22% / 19%	15% / 13%	6% / 6%	4% / 5%

As we would imagine, students' self-perception of their technology prowess may have implications for their interest in STEM career fields. Based upon this year's Speak Up results, a 10 percentage point differential exists between boys and girls in their strong interest in pursuing a STEM career; 29 percent of high school boys say that they are very interested in a job or career in a STEM field, but only 19 percent of girls share that same vision for themselves. However, contrary to conventional wisdom or mythology, we continue to see a STEM interest gap even between girls and boys who self-assess their technology skills as advanced as depicted in Chart 7.

Chart 7: Interest Level in a STEM Career by Advanced Technology-Using High School Students



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During the seven years that the Speak Up surveys have polled high school students on their interest in STEM fields, the level of student interest has not increased significantly. Thus, despite the investments by both public and private entities in developing students' and most notably girls' interest in STEM fields, the pipeline at the interest level has not expanded. One possible explanation for this stagnation may be that the approaches that we are using to attract students to explore career choices lack sensitivity to students' general interest in more personalized and digital explorations, and the differences between girls and boys. While many students continue to be interested in visiting companies to learn about careers (58 percent), participating in school based career exploration programs (47 percent) and having teachers with a background in a STEM profession (43 percent), increasingly girls in particular are interested in socially-based and digital career exploration opportunities that can be highly individualized to their interest levels. A new approach to engage girls in STEM fields may therefore include providing an online self-assessment of skills and interests (34 percent), working with mentors who can guide college choices (32 percent) and access to websites and day in the life videos for self-directed career exploration (28 percent). The development of new digital learning playbooks therefore is not limited to just the use of technology for schoolwork, but increasingly has applicability to how students want to explore and learn about careers.

Just as the myth of quartz fragments creating the night sky constellations lost its glimmer at some point for the Navajo people, the mythology around students' use of technology has now outlived its value in our K-12 schools and districts. It is time to think beyond simplistic, adult-invented assumptions about how today's learners want to use digital tools within their learning lives, and instead use the authentic ideas and actual practices of students to inform and inspire new visions for digital learning within K-12 education. Let's illuminate a fresh dawn of education by listening to students and incorporating their personalized learning visions within our new digital learning playbooks.

About the Speak Up National Research Project and Speak Up 2013

Speak Up is a national initiative of Project Tomorrow®, the nation's leading education nonprofit organization dedicated to the empowerment of student voices in education. Each year, the Speak Up National Research Project polls K-12 students, parents and educators about the role of technology for learning in and out of school. This survey represents the largest collection of authentic, unfiltered stakeholder voices on digital learning. Since fall 2003, over 3.4 million K-12 students, parents, teachers, librarians, principals, technology leaders, district administrators and members of the community have shared their views and ideas through Speak Up. K-12 educators, higher education faculty, business, and policy leaders report that they regularly use the Speak Up data to inform federal, state and local education programs.

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%) 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 2nd and December 20th 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 represent nation-wide school demographics. The data are analyzed using standard cross-tab analysis.

For additional information on the Speak Up methodology, please contact the Project Tomorrow research team.

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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 K-12 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 voice on digital learning. Since 2003, over 3.4 million K-12 students, parents, teachers, librarians, principals, technology leaders, district administrators and members of the community have shared their views and ideas through Speak Up.

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