

Future Readiness at a Public Middle School: Executive Summary

Evaluating the Current Implementation of Emerging Technologies and 21st Century Skills

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Introduction

Students need to be prepared for the careers of the future. Technology is ever-changing and many students are already experimenting with technology in their personal lives. Unfortunately, students are not often given the opportunity to learn best practices for the safe and productive use of these tools at school. So, the question remains why aren't students learning in this way?

Background

The choice to focus this survey on emerging technologies and 21st century skills was initially inspired by my district's mission statement, or "areas of knowledge and skills that all students must master by graduation to successfully live and compete in today's dynamic global environment. The Mission and Ends set the educational direction for the entire District." End number four states that "Students will understand and apply current and emerging technologies to extend their personal abilities and productivity." As such, I set out to survey the staff at my own school to better understand where we fell on the spectrum of emerging technology implementation. To supplement this, it seemed natural to include the basic elements of the [Partnership for 21st century learning](#)'s four core skills: communication, collaboration, creativity and critical thinking. If our students are to be future ready or career ready, emerging technologies and 21st century skills are reasonable considerations for their learning. My hypothesis was that our school could be more prepared, as a whole, to implement some of these technologies and complementary skills.

Methods

Using Survey Monkey, an electronic survey was conducted as an internal evaluation to formatively evaluate methods for providing services to learners to include "a. Curriculum design" and "b. Classroom processes" (Sanders & Sullins, 2006, p. 7-9). Also categorized as a needs assessment, this survey can potentially be used to determine professional learning and/or resources to be utilized for meeting these needs in the future. The survey falls in line with goal number four of President Obama's ConnectED INITIATIVE as outlined in [The Office of Educational Technology's 2016 National Education Technology Plan](#): "Empower students with digital learning content and experiences aligned with college- and career-ready standards being adopted and implemented by states across America" (p. 40).

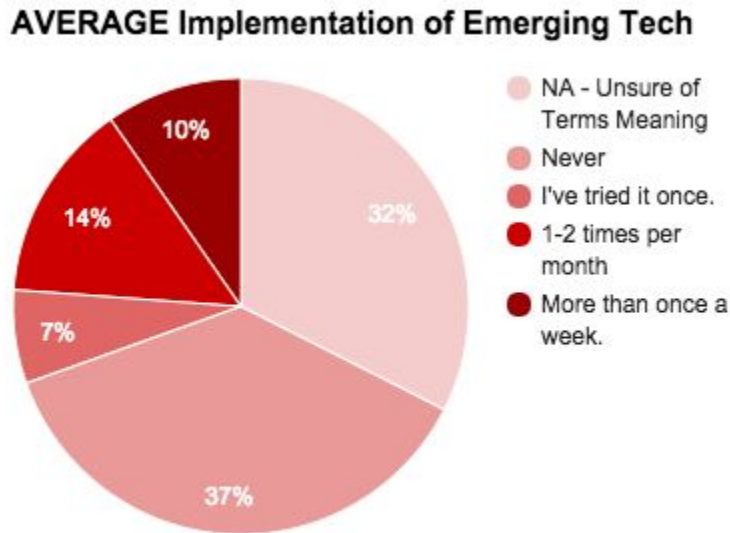
Surveying a total of 48 teachers, a response rate of 66% resulted. Although not all participants personally identified themselves, the 24 teachers who did represented a wide diversity of curriculum areas within the school: Language Arts, Social Studies, Math and Science, Technology, Video Production, Digital Photography, Special Education, Spanish, Art, Drama, as well as the Librarian. All three grade levels (6,7,8) within the school were also represented by the participants. Questions were asked in a systematic, thematic fashion, with the same format of questions for the two focus categories: emerging technologies and 21st century skills. Teachers were asked to identify their perceived level of implementation for each focus category using a likert scale. The likert scale included the following options: N/A - Unsure of term's meaning, Never, I've tried it once, 1-2 times per month, More than once a week.

Results

The data was quantitatively analyzed in its entirety, using frequency distributions. Follow-up interviews were also conducted with any willing participants for additional qualitative analysis. An overarching pattern began to emerge between the two categories of data gathered. As evidenced by the pie charts that follow, **emerging technologies were reported to**

be rarely implemented, if understood at all. By contrast, a 21st century skills were reported by a majority of the teachers surveyed to be widely implemented.

Emerging Technologies

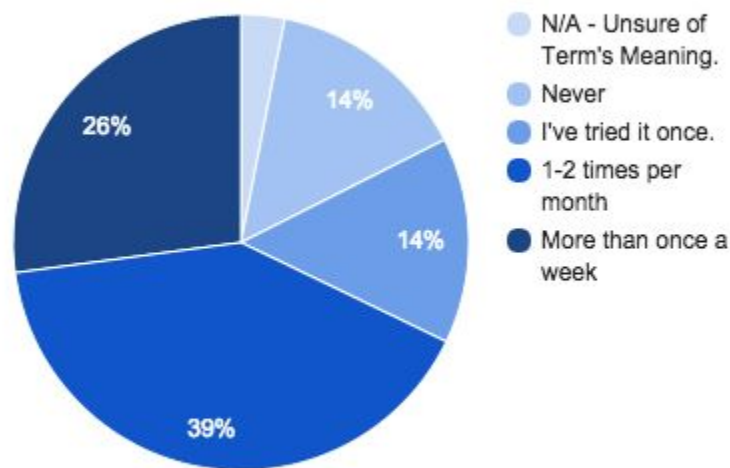


Emerging technologies were reported to be mostly misunderstood or never implemented by teachers. For emerging technologies, the most widely implemented (implementation is determined by combining the following response types: I've tried it once, 1-2 times per month, and More than once a week) examples were "Mobile Learning Beyond the School Day," "Cloud Computing" and "Personal Devices/BYOD," with total percentages of 53%, 53% and 72% respectively.

At 55% each, both "Open Content" and "Learning Analytics" were terms in which many teachers indicated that they were unsure of the term's meaning. Similarly, at 52% and 48%, respectively, "Digital Badge Programs" and "Gamification" were also terms that many respondents stated no knowledge of. Interestingly, 41% of respondents also indicated that they didn't know what "Blending Learning" meant. Finally, at 61% and 58%, respectively, "Wearable Technology" and "Digital Badge Student Portfolios" were the emerging technologies that most respondents said that they never implement.

21st Century Skills

AVERAGE Implementation of 21st C. Skills



By contrast, **21st century skills were shown to be widely implemented**. Teachers were surveyed about the following 21st century skills in a total of eight questions: communication, collaboration, creativity and critical thinking. Six out of the eight questions, which covered all four skills, indicated wide implementation (implementation is determined by combining the following response types: I've tried it once, 1-2 times per month, and More than once a week) with totals between 90-97%. Interestingly, the two questions that indicated a dramatically different lack of implementation (lack of implementation is determined by combining the following response types: N/A - Unaware of the term's meaning, Never) at 43% and 50%, respectively, were:

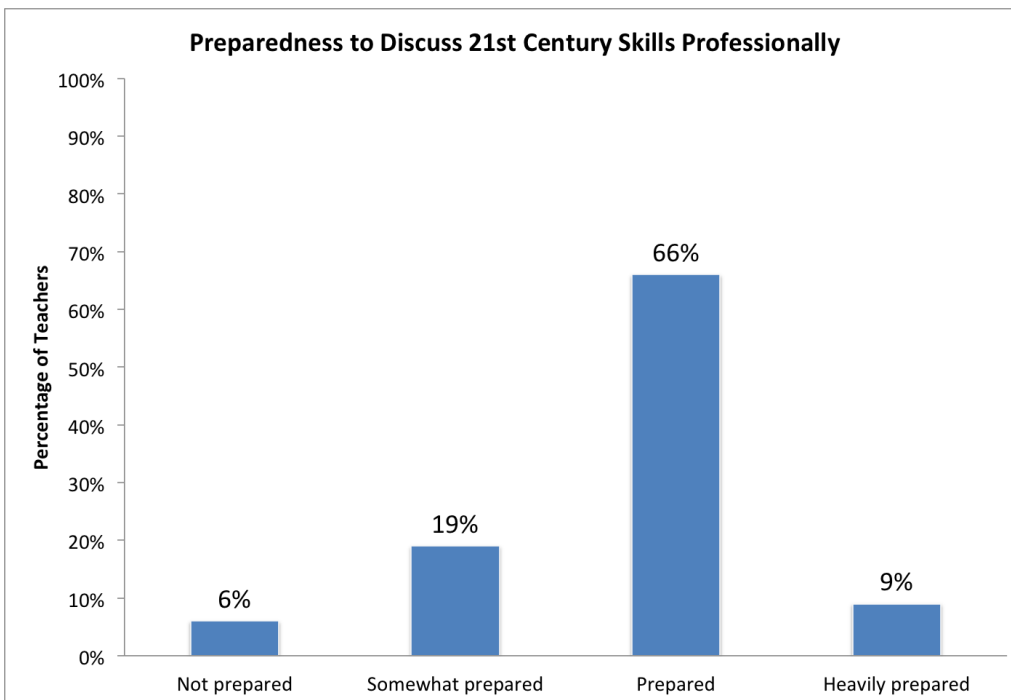
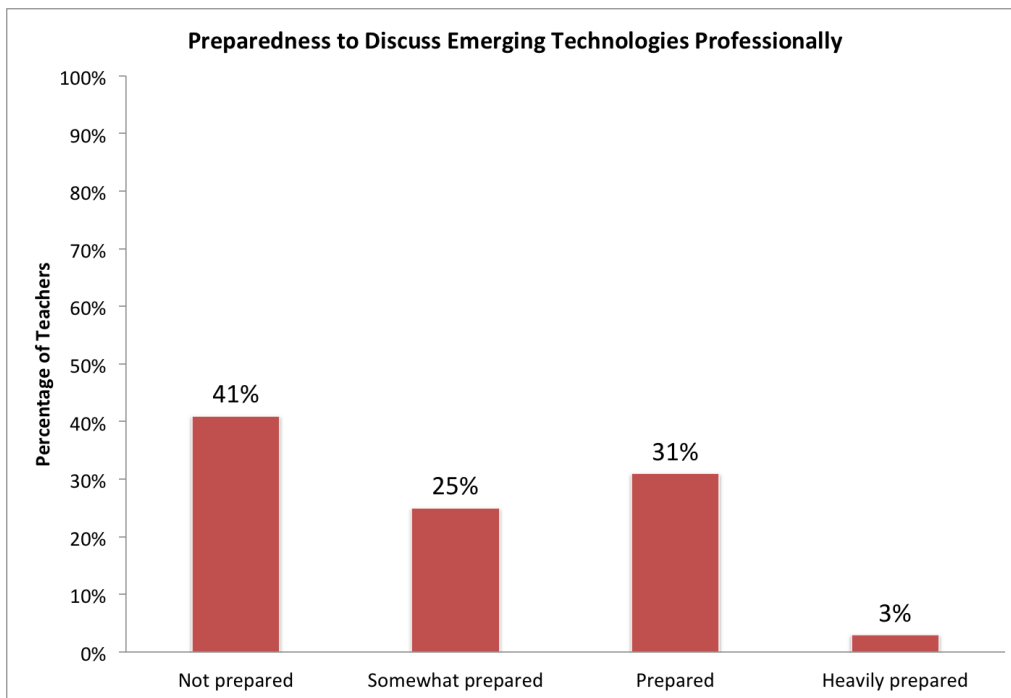
Communication/Collaboration: Opportunities provided for students to communicate and/or collaborate with students who do not attend their same school, to include students on a global scale.

Communication/Collaboration: Opportunities provided for students to communicate and/or collaborate with professionals or experts in a particular field.

It is notable that these were the only two questions asked both at this level of specificity and in a way that might suggest the implicit use of technology.

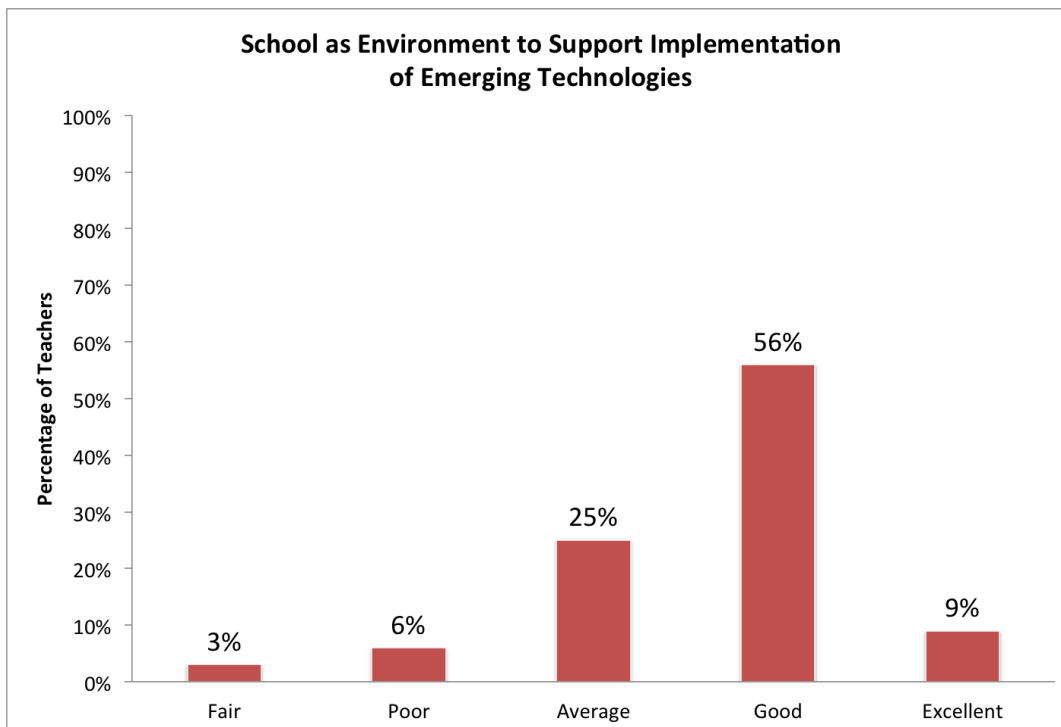
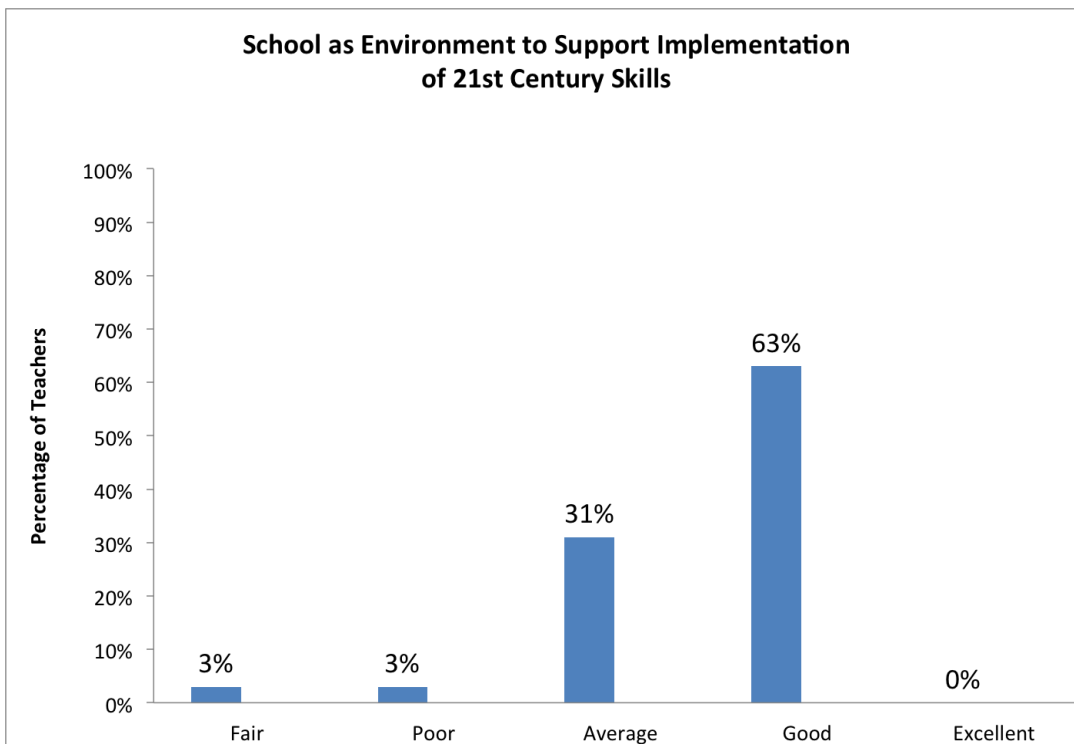
Preparedness to Discuss Professionally

As a follow-up to implementation questions, teachers were asked to indicate their ability to discuss emerging technologies and 21st century skills professionally. Given the data presented above, it is not surprising that **most teachers felt unprepared to discuss emerging technologies with their professional teams** (lack of preparation was determined by combining the following response types: Not Prepared). However, by contrast, **most teachers surveyed felt relatively prepared to discuss 21st century skills** (preparation was determined by combining the following response types: Somewhat Prepared, Prepared, and Heavily Prepared).



School as an Environment for Implementation

Finally, teachers surveyed were asked about how suitable they perceived the school environment to be for implementation. Despite the contrast in responses above, **teachers definitively responded that the school is a suitable environment for learning about both emerging technologies and 21st century skills** (suitability was determined by combining the following response types: Average, Good, Excellent).



Conclusions & Implications

The following bullet points highlight the biggest takeaways from the survey results.

- Little is known about emerging technologies.
- Teachers feel that they are implementing 21st century skills regularly.
- Teachers feel unprepared to discuss emerging technologies, but prepared to discuss 21st century skills.
- Teachers feel that the school is a suitable environment for implementation in the future.

One of the most significant takeaways was the number of teachers surveyed who felt wholly unaware of emerging technologies. Interestingly, of the eight teachers with whom follow-up interviews were conducted, most suggested in some fashion that they weren't interested in learning about them. Some teachers cited lack of time, too much time devoted to new initiatives already, and/or lack of resources available to make it possible or worthwhile.

Of particular note, were the questions addressing 21st century skills. It is notable these questions did not include the phrase "with technology" anywhere. As a result, the responses did not necessarily reflect the original intentions of the survey. For example, teachers may interpret the questions about communication and collaboration to mean the implementation of face-to-face group projects or table work, rather than situations involving technology. For many of the questions, this may have resulted in skewed data. The follow-up interviews conducted validated this suspicion, as five of the seven teachers teachers changed their responses to these questions dramatically when the phrase "with technology" was added, by either reducing the level of implementation or stating that they never implement.

As stated previously, not many teachers interviewed expressed interest in learning about emerging technologies. While the original intent of the survey was a needs assessment to identify professional learning needs within the school, the end result left me thinking that teacher interest in these topics is a valuable and, overlooked, aspect. The survey fails to take into account the personalized interest of the stakeholders who would participate in said learning.

Next Steps and Takeaways

Reframing the Survey to Address Technology

Given the problems identified with some of the data, the next logical step would be to answer the question: How would I obtain the data sought regarding 21st century skills? It would be pertinent to determine, with very specific scenarios, how teachers are currently implementing 21st century skills *with technology*. Garnering this information via another survey might lend itself to some valuable, comparable data about how teachers at Pacific Cascade Middle School are specifically using technology as a tool to teach students the 21st century skills needed to be successful in future careers. Below are examples in each of the four types of 21st century skills (communication, collaboration, creativity, critical thinking) of how some of the original questions might be updated to reflect this goal.

Indicate to what extent any of the following examples of 21st century skills are purposefully implemented into your curriculum.

Communication/Collaboration

Original: Opportunities provided for students to communicate and/or collaborate with students who attend their same school.

Updated: Opportunities provided for students to use digital tools such as blogging tools, online discussion boards, wikis, social media, collaborative online bulletin boards, online learning management systems or collaborating documents such as Google Docs, to communicate and/or collaborate with students who attend their same school.

Creativity

Original: Opportunities provided for students to express themselves creatively and/or develop innovative thoughts or products.

Updated: Opportunities provided for students to use digital tools to digitally storytell using movie making software.

Critical Thinking

Original: Opportunities provided to learn flexibility & adaptability.

Updated: Opportunities provided for students to select their own digital tools for an assigned project, as well as time to troubleshoot unknown digital tools in response to challenges without loss of credit.

Offering Targeted Professional Learning Opportunities

During follow-up interviews, teachers said that while emerging technologies were of little interest for a variety of reasons, teachers surveyed indicated that 21st century skills are already being implemented in some fashion. **A solution for both exposing teachers to emerging technologies and to the implementation of 21st century skills with technology would be to provide professional learning on 21st century skills that utilize emerging technologies.**

21st Century Skills and Emerging Technologies

Professional learning titles and descriptions that highlight the combined implementation of both 21st century skills and emerging technologies are below.

Communication and Social Media in Language Arts

- ❑ Learn how students can practice online communication skills using Skype to discuss writer's craft and purpose by holding a Skype video call with a published author.

Collaboration and Blogging in Social Studies

- ❑ Learn how students can practice collaboration skills through the use online blogging tools by practicing how to give and receive feedback about their ongoing coursework.

Creativity and Scratch in the Visual Arts

- ❑ Learn how students can showcase their creativity by using coding software, such as Scratch, to design graphic animations.

Critical Thinking and Makerspaces in Science

- ❑ Learn how students can practice their critical thinking skills by participating in makerspaces to to build prototypes, explore unique design challenges, fail and retry.

Resources

Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2015). NMC Horizon Report: 2015 K-12 Edition. Austin, Texas: The New Media Consortium. Retrieved from <http://cdn.nmc.org/media/2015-nmc-horizon-report-k12-EN.pdf>

Partnership for 21st Century Skills (2016). *Framework for 21st century learning*. Retrieved from <http://www.p21.org/our-work/p21-framework>

Sanders, J. R., & Sullins, C. D. (Eds.). (2005). *Evaluating school programs: An educator's guide*. Corwin Press.