21ST CENTURY SKILLS AND THE WORKPLACE

A 2013 MICROSOFT PARTNERS IN LEARNING AND PEARSON FOUNDATION STUDY

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21ST CENTURY SKILLS AND THE WORKPLACE

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FOREWORD

Microsoft Partners in Learning and the Pearson Foundation believe that students' development of 21st century skills combined with student aspiration in education are the keys to unlocking individuals' future potential in the workplace.

This study aims to explore the relationships between 21st century skills developed in the classroom, student aspiration in schools, and perceived quality of work later in life. Twenty-first century skills are advanced skills that prepare and equip youth for the challenges and demands of work in the 21st century. These skills have been identified and defined by the Innovative Teaching and Learning Research project and include: collaboration, knowledge construction, problem solving and innovation, self-regulation, the use of technology for learning, and skilled communication. For this study, the Pearson Foundation, Microsoft Partners in Learning, and Gallup collaborated to measure these skills alongside nationally validated measures of student aspiration across Americans aged 18-35 who are either students or employed.

Some of the questions addressed in the study are:

- Do recent graduates credit their formal education with developing the skills they use in their jobs?

- Are students across varying education levels developing 21st century skills in school that will prepare them for today's knowledge-based, technology driven, globalized environment?

- How does the development of 21st century skills relate to self-reported work quality later in life?

- Which 21st century skills provide the most support for future success in the workplace?

- How does student aspiration in schools relate to the development of 21st century skills and future work quality?

SNAPSHOT OF FINDINGS

- The **majority of respondents** (59%) reported that they agree or strongly agree that **they developed most of the skills they use in their current job outside of school**. Only 15% disagree or strongly disagree, indicating they felt that they developed these skills in school.

- Developing 21st century skills in the last year of school is positively correlated with higher perceived work quality later in life. In fact, **those who have high 21st century skill development are twice as likely to have higher work quality** compared to those who had low 21st century skill development.

- Across the 21st century skills included in this study, **real world problem-solving** is the significant driver of higher work quality; however, less than **two-thirds** (63%) of respondents reported developing this skill **often** in the last year of school and that number drops to **less than half** (39%) for **high school graduates**.

- In their last year of school, those who often used 21st century skills are more likely to have had greater student aspiration and engagement; and **student aspiration and engagement is also positively correlated to work quality later in life**.

- Across the student aspiration conditions, **good teacher-student relationships** is a primary driver; students who feel their teachers care and support them are more likely to perceive themselves as successful and valued in their jobs later in life.

- Although a wide majority (86%) of respondents says they used computers and technology to complete assignments or projects in their last year of school, only 14% report they used technology for collaboration, indicating that students are not developing the type of advanced technology skills that would be used later in the workplace.

- Younger respondents, aged 18-22, report slightly higher levels of 21st century skill development and this may be an indicator that teaching strategies are changing in the U.S.; however, the largest opportunity may lie with high school graduates who report the lowest levels of overall 21st century skill development.

METHODOLOGY

The following report presents findings from a quantitative survey that Gallup conducted on behalf of Microsoft Partners in Learning and the Pearson Foundation. The overall objective of this study is to determine the prevalence of 21st century skills in secondary and post-secondary education, and its impact on perceived quality of work later in life. Additionally, this research aims to address the relationship between 21st century skills and various levers of student engagement, namely students' perceptions of community, support, and voice in their own education experiences.

To achieve these objectives, Gallup conducted 1,014 interviews with members of the Gallup Panel aged 18-35 years who are either employed or students residing in telephone households, including cellphone only households. All interviews were conducted via outbound telephone interviewing. The Gallup Panel is a nationally-representative research panel. All members of this proprietary in-house, probability-based panel are recruited via dual frame landline and wireless telephone methodology or address-based sampling (ABS). Unlike most panels, panel members do not receive incentives for participation. The Gallup Panel currently includes 60,000 individuals who represent more than 50,000 households. Gallup recruits members on an ongoing basis to account for attrition. Gallup maintains extensive demographic profiles for each member, allowing for in-depth custom research on low-incidence populations and for tracking longitudinal changes in member behavior and opinions.

Gallup conducted surveys in English only from April 26-30, 2013. Up to five calls were made to each household to reach an eligible respondent.

The questionnaire was developed in consultation with representatives from the Pearson Foundation, Microsoft Partners in Learning, and Gallup. All interviewing was supervised and conducted by Gallup's full-time interviewing staff. For results based on the total sample size of 1,014 adults, one can say with 95% confidence that the margin of error attributable to sampling error is ±3%. For subgroups within this population (e.g., education level, gender, and income), the margin of error would be greater. In addition to sampling error, question wording and practical difficulties in conducting surveys can introduce error or bias into the findings of opinion polls. Due to the specificity of the population and unavailability of such population targets, un-weighted data is presented in this report. The following paper presents key findings of the survey. Reported frequencies may not add up to 100% due to rounding or the exclusion of "don't know" and refused results in some cases.

DETAILED FINDINGS

PERCEPTIONS OF SKILL DEVELOPMENT

Respondents are nearly four times more likely to credit the skills they use for their work to outside activities rather than to the classroom. The majority of respondents (59%) agree or strongly agree that most of the skills used in their current job were developed outside of school. Only 15% disagree or strongly disagree, indicating they felt that these skills were developed in school.

Most of the skills I use in my current job, I developed outside of school.
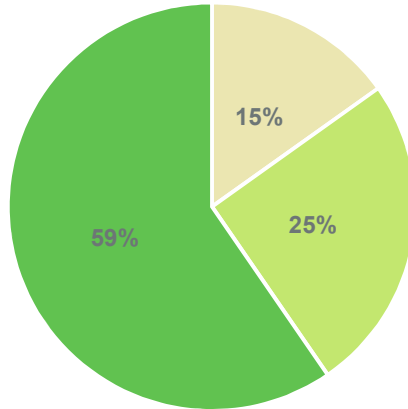
- Strongly disagree or disagree (1-2)
- Neither agree nor disagree (3)
- Strongly agree or agree (4-5)

This trend is even more pronounced among high school graduates. Nearly six in ten (59%) respondents with a high school education or less **strongly agree** the skills used in their current jobs were developed outside of school. Compared to respondents with college (35%) or post graduate work or degrees (21%), those with high school degrees or less do not seem to rely on the skills learned in the classroom in their day-to-day work, indicating a potential call to action for high schools to better prepare youth for work.

Thinking about your current work situation, one a five-point scale, where "5" means strongly agree and "1" means strongly disagree, please tell me how much you agree or disagree with each of the following items… Percentage of respondents reporting "5 - Strongly agree" (n=901)									
		EDUCATION			**GENDER**		**AGE**		
	Total	**High school graduate or less**	**Some college or college graduate**	**Post graduate work or degree**	**Males**	**Females**	**18-22**	**23-29**	**30-35**
Most of the skills I use in my current job, I developed outside of school.	33%	59%	35%	21%	36%	29%	35%	34%	33%

*Items only asked of those respondents with part- or full-time employment.

PREVALENCE OF 21ST CENTURY SKILLS IN EDUCATION

The Innovative Teaching and Learning (ITL) Research project defined and measured 21st century skills that are critical for preparing students to work in today's knowledge-based, technology driven, globalized environment. The seven 21st century skills included in this study were based on the ITL measures: collaboration, knowledge construction, skilled communication, global awareness, self-regulation, real world problem solving, and use of technology for learning.

Respondents were asked how often they performed activities that support these important 21st century skills. Across these activities, the highest proportions of respondents reporting that they did an activity "often" include:

- "Using computers or technology to complete an assignment or projects" (86%), and

- "Spending time analyzing information or ideas to draw conclusions about a topic" (73%).

The lowest proportions of respondents reporting that they did an activity "often" include:

- "Working with others through videoconferencing, online discussion boards, or online collaboration tools, like Skype"(14%), and

- "Using what you were learning about to develop solutions to real world problems in your community or in the world" (29%).

Age plays a role in the discussion around 21st century skills. The data show younger respondents reporting slightly higher levels of development of 21st century skills. Respondents aged 18-22 are more likely than those aged 23-35 to say they often used 21st century skills in their last year of school, particularly in the areas of knowledge construction, self-regulation, and skilled communication. This may be an indicator that teaching strategies in the U.S. are changing to include more 21st century skills.

Level of education is also related to likelihood of experiencing 21st century skills. Respondents with post graduate work or degrees are most likely to have more often experienced all 21st century skills compared to others, while high school graduates are the least likely. High school graduates thus present an opportunity to educators to increase activities in the classroom that develop these skills.

Now I'd like you to think about your last year of school. Please tell me if you have done each of the following often, sometimes, rarely, or never… Percentage of respondents reporting doing 21st century skill-related activities "often"									
		EDUCATION			**GENDER**		**AGE**		
	Total	**High school graduate or less**	**Some college or college graduate**	**Post graduate work or degree**	**Males**	**Females**	**18-22**	**23-29**	**30-35**
TECHNOLOGY									
Used computers or technology to complete an assignment or project?	**86%**	50%	90%	92%	85%	88%	89%	89%	82%

Now I'd like you to think about your last year of school. Please tell me if you have done each of the following often, sometimes, rarely, or never…
Percentage of respondents reporting doing 21st century skill-related activities "often"

		EDUCATION			GENDER		AGE		
	Total	High school graduate or less	Some college or college graduate	Post graduate work or degree	Males	Females	18-22	23-29	30-35
Worked with others through videoconferencing, online discussion boards, or online collaboration tools, like Skype?	14%	3%	15%	15%	13%	15%	11%	13%	15%
KNOWLEDGE CONSTRUCTION									
Spent time analyzing information or ideas to draw conclusions about a topic?	73%	46%	71%	88%	74%	72%	76%	76%	68%
Applied a concept you learned to a different context or problem?	59%	46%	56%	70%	55%	64%	72%	60%	53%
SKILLED COMMUNICATION									
Developed communication such as an essay or presentation that included facts, information or numbers to support your ideas?	66%	42%	68%	76%	63%	71%	71%	65%	67%
REAL WORLD PROBLEM SOLVING									
Worked on a long-term project that took several classes to complete?	52%	28%	50%	65%	49%	54%	51%	52%	52%

Now I'd like you to think about your last year of school. Please tell me if you have done each of the following often, sometimes, rarely, or never…
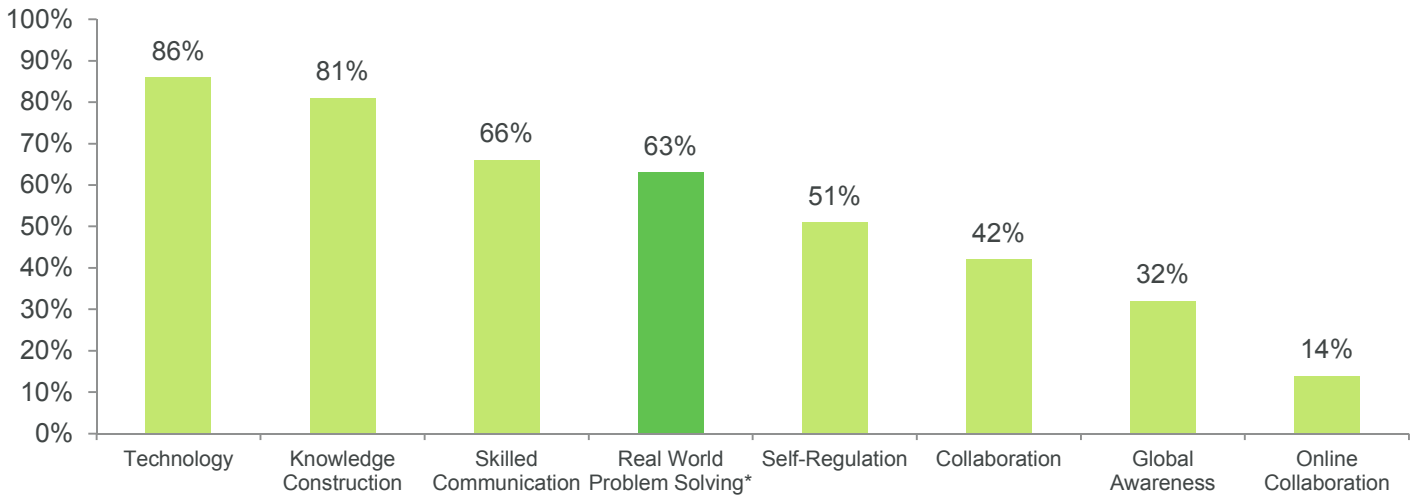Percentage of respondents reporting doing 21st century skill-related activities "often"

		EDUCATION			GENDER		AGE		
	Total	High school graduate or less	Some college or college graduate	Post graduate work or degree	Males	Females	18-22	23-29	30-35
Used what you were learning about to develop solutions to real problems in your community or in the world?	29%	22%	27%	37%	27%	32%	37%	28%	28%
SELF REGULATION									
Used feedback from your instructor or other students to revise your work before receiving a final grade?	44%	34%	45%	45%	44%	44%	54%	43%	40%
Gave feedback to other students to help them improve their work?	36%	35%	36%	36%	37%	34%	40%	36%	34%
COLLABORATION									
Worked together with other students on class projects for which you had shared responsibility?	42%	34%	41%	46%	43%	41%	42%	42%	42%
GLOBAL AWARENESS									
Studied information about other countries or cultures that made you aware of how the world is connected?	32%	31%	31%	35%	33%	29%	45%	32%	25%

21ST CENTURY SKILLS AND EXCELLENCE IN WORK QUALITY

As part of this study, respondents were asked questions to measure their perceived current quality of work, which was then analyzed in relationship to 21st century skills developed. **The data shows that developing 21st century skills in the last year of school is positively correlated with higher work quality later in life**. Across the 21st century skills included in this study, **real world problem solving** is the most significant driver of higher work quality; however, **only 63% of students report often developing this skill in their last year of school**.

Percentage of Respondents Reporting Developing 21st Century Skills "Often"

Skill	Percentage
Technology	86%
Knowledge Construction	81%
Skilled Communication	66%
Real World Problem Solving*	63%
Self-Regulation	51%
Collaboration	42%
Global Awareness	32%
Online Collaboration	14%

> *** Real world problem solving is the significant driver of higher work quality.**

Real world problem solving is measured based on two supporting survey questions. The first question is "Thinking about your last year in school, about how often, if ever, did you work on a long-term project that took several classes to complete?" The second question is "Thinking about your last year in school, about how often, if ever, did you use what you were learning about to develop solutions to real problems in your community or in the world?" These two specific activities support project-based learning in school, which is designed to give students opportunities to apply knowledge and ideas to real world problems.

The aim of 21st century skill development is to maximize the potential of each student to achieve success in life and reach his or her goals. To measure this perceived success, respondents assessed their current quality of work and were asked four questions to measure the concept of excellence in work quality.

Compared to most people in America who are about your age, how successful are you? Would you say you are less successful, about as successful, or more successful?
Percentage of respondents reporting "More successful" (n=901)

	Total	EDUCATION			GENDER		AGE		
		High school graduate or less	Some college or college graduate	Post graduate work or degree	Males	Females	18-22	23-29	30-35
Compared to most people in America who are about your age, how successful are you?	43%	31%	40%	54%	49%	35%	57%	45%	38%

*Items only asked of those respondents with part- or full-time employment.

Men are more likely to strongly agree with several measures of work quality than women. Men are more likely than women to say they perceive themselves as more successful than their peers (49% versus 35%) and men are more likely to strongly agree to having a voice in decision making in the workplace (34% vs. 27%) and being a valued member of the workplace (51% vs. 46%).

Still thinking about your current work situation, one a five-point scale, where "5" means strongly agree and "1" means strongly disagree, please tell me how much you agree or disagree with each of the following items…
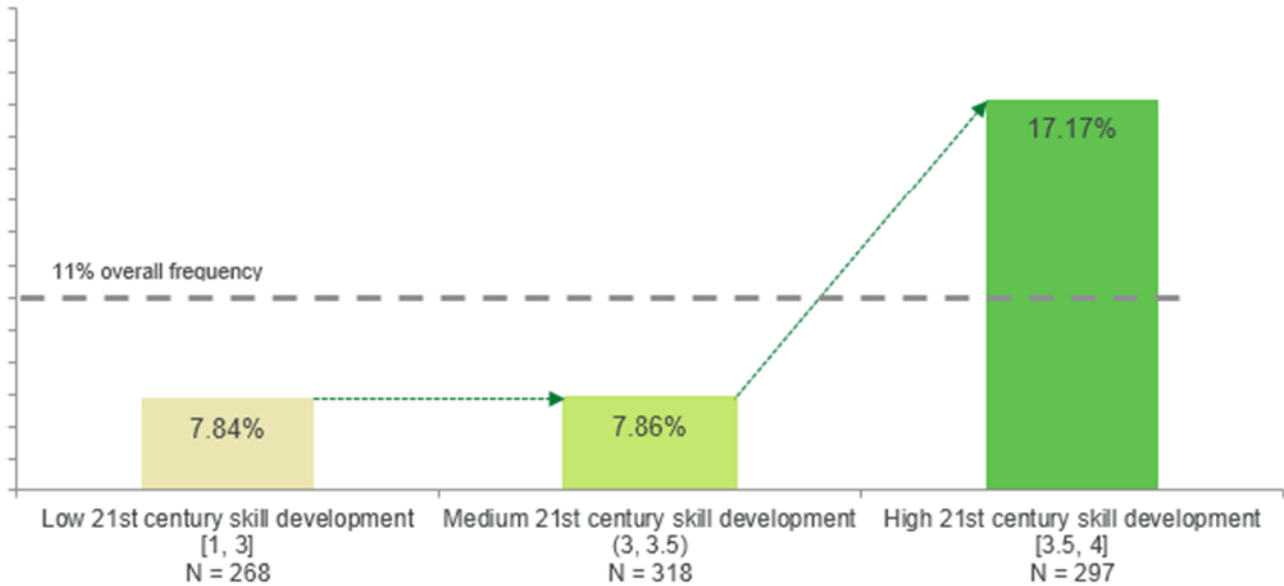Percentage of respondents reporting "5 - Strongly agree" (n=901)

	Total	EDUCATION			GENDER		AGE		
		High school graduate or less	Some college or college graduate	Post graduate work or degree	Males	Females	18-22	23-29	30-35
I am successful in my job.	47%	48%	44%	50%	47%	46%	46%	42%	51%
I have a voice in decision making in my workplace.	31%	31%	31%	29%	34%	27%	31%	29%	33%
I am a valued member of my workplace.	49%	52%	49%	47%	51%	46%	46%	52%	51%

*Items only asked of those respondents with part- or full-time employment.

Respondents are categorized as having achieved excellence in work quality if they consider themselves more successful relative to others, and strongly agree that they are successful in their job, have a voice in decision making, and are a valued member of their workplace. Respondents are also categorized as having low, medium, or high 21st century skill development in school based on the value of their individual 21st century skill index score.

Percentage of Respondents Achieving Excellence in Work Quality

11% overall frequency

		17.17%
7.84%	7.86%	

Low 21st century skill development
[1, 3]
N = 268

Medium 21st century skill development
(3, 3.5)
N = 318

High 21st century skill development
[3.5, 4]
N = 297

Respondents with high 21st century skill development are twice as likely as those with low or medium 21st century skill development to achieve excellence in work quality.

The fact that there is no significant difference between the low and medium groups suggests that **students must experience 21st century skills development frequently and broadly to have a positive impact on future work quality**.

See Appendix for more information on the indices used in this analysis.

STUDENT ASPIRATIONS

In addition to developing sound 21st century skills, research spearheaded by the Quaglia Institute finds that student aspirations are key indicators of student success. Student self-worth, engaged learning, and a sense of purpose are critical components for student success in reaching their potential. Several of these conditions were measured in this study to determine if student aspirations are indeed correlated with the development of 21st century skills and higher work quality later in life.

Nearly one-quarter (22%) of respondents strongly disagree that they had a voice in decision making in their school and only four in ten respondents strongly agree that their school was a welcoming and friendly place. Although over one-third (38%) of respondents report feeling administrators and teachers at their school listened to students' suggestions, nearly half (44%) disagree that they had a voice in decision making at their school, indicating a supportive administration does not necessarily translate to student empowerment or feeling of effectiveness.

Although male respondents reported higher work quality, women in this study are thriving in the classroom environment, as they are more likely than men to strongly agree with nearly all aspects of student aspiration. In particular, female and male respondents significantly differ in agreement that teachers expected them to be successful in their courses (62% vs. 45%) and that they felt administrators and teachers listened to student suggestions (17% vs. 8%).

Still thinking about your last year of school, on a five-point scale, where "5" means strongly agree and "1" means strongly disagree, please tell me how much you agree or disagree with each of the following items…
Percentage of respondents reporting "5 - Strongly agree"

	Total	EDUCATION			GENDER		AGE		
		High school graduate or less	Some college or college graduate	Post graduate work or degree	Males	Females	18-22	23-29	30-35
Teachers cared if I was absent from school.	29%	31%	26%	31%	25%	33%	28%	30%	28%
Teachers cared about my problems and feelings.	17%	23%	16%	31%	13%	22%	19%	18%	15%
Teachers knew about my hopes and dreams.	13%	18%	11%	15%	10%	18%	12%	13%	15%
Teachers expected me to be successful in their courses.	52%	45%	48%	64%	45%	62%	49%	51%	55%
School was a welcoming and friendly place.	40%	29%	40%	41%	36%	45%	42%	38%	40%
Students were supportive of one another.	29%	11%	27%	40%	27%	32%	27%	26%	32%
I had a voice in decision making at my school.	10%	13%	10%	7%	8%	12%	9%	10%	10%
Administrators and teachers at my school listened to students' suggestions.	12%	15%	13%	7%	8%	17%	14%	12%	11%
I was a valued member of my school community.	16%	16%	16%	14%	14%	18%	19%	15%	15%

The student aspiration questions can be categorized into three conditions: teacher support; sense of belonging; and student voice. As part of this study, the relationship between student aspiration, 21st century skills, and future work quality was analyzed.

Respondents who report that they had often experienced 21st century skills are more likely to have had greater student aspiration in their last year of school. This finding supports the connectedness of student aspiration with the development of 21st century skills in school. **Respondents who feel they had teacher support and a sense of belonging are more likely to say they often applied 21st century skills in their last year of school**.

Student aspiration is also positively correlated to higher work quality later in life. Again, **teacher support** is a significant driver, indicating students who feel their teachers care about and support them are more likely to perceive themselves as successful and valued in their workplace later in life.

TECHNOLOGY IN THE CLASSROOM AND WORKPLACE

Technology is a critical enabler for students to develop solutions to real world problems, especially when project-based learning and 21st century skills are utilized in the classroom. It is not surprising that respondents overwhelmingly report using technology in school (86%) often and agree or strongly agree that they rely on it in their current jobs (79%). However, few respondents (14%) report using technology for collaboration - an example of the type of advanced technology that is becoming more important in today's highly virtualized work environment.

Those respondents with part-time or full-time employment and a high school degree or less are significantly less likely to strongly agree that using technology is necessary in their current job (33%); comparatively, nearly four out of five employed respondents (79%) who have post graduate work or degree strongly agree technology is necessary for their current job. There are also significant differences by age on this topic. More than seven in ten respondents (72%) aged 30-35 say using technology is necessary in their current job compared to 43% of 18-22 year olds. There are positive associations between respondents' higher levels of education, use of technology in work, and work quality.

Still thinking about your current work situation, one a five-point scale, where "5" means strongly agree and "1" means strongly disagree, please tell me how much you agree or disagree with each of the following items…
Percentage of respondents reporting "5 - Strongly agree" (n=901)

		EDUCATION			GENDER		AGE		
	Total	High school graduate or less	Some college or college graduate	Post graduate work or degree	Males	Females	18-22	23-29	30-35
Using technology is necessary in my current job.	65%	33%	63%	79%	63%	68%	43%	63%	72%

*Item only asked of those respondents with part- or full-time employment.

CONCLUSION

The research from this study shows the connectedness and positive correlation between development of 21st century skills in the last year of school, student aspiration and engagement in school, and higher quality of work later in life. Of the constructs assessed in this study, real world problem solving and good student-teacher relationships are two of the primary drivers of higher work quality later in life. These data also show that in order to have a true impact on future work quality, the development of 21st century skills must be experienced by students frequently and consistently.

APPENDIX

INDEX DEVELOPMENT

Several indices were created to effectively classify respondents on a range of topics measured by numerous underlying individual survey items. Overall indices were developed for both 21st century skills and student aspiration from a respective set of sub-indices. Overall index scores are calculated as the means of its sub-indices and sub-indices are in turn calculated as the means of the individual items that make up the sub-index.

The 21st century skills overall index consists of the following seven sub-indices: collaboration; knowledge construction; skilled communication; global awareness; self-regulation; real world problem solving; and technology used in learning. The 21st century skills overall index is categorized into high, medium and low scores based on the index's relation to outcome measures. Those who have a high 21st century skills index score are most likely to have often experienced 21st century skill-related activities compared to those with a low index score. The 21st century skills index is a multivariate index created using logistic regression.

The student aspiration overall index is a multivariate index created using logistic regression, which includes the following three sub-indices: teacher support; sense of belonging; and student voice. The student aspirations overall index remains on a scale rather than being categorized into high and low subgroups.

A third index, work quality, was developed by scoring respondents based on their responses to several items. Respondents are categorized as a "0" or "1" on the work quality index based on their responses, where "0" means low work quality and "1" means high work quality. Items used in the work quality index include self-reported success compared to others, success in the workplace, voice in decision making in the workplace, and being a valued member of the workplace; respondents categorized as a "1" on the index must have responded positively to all four items. The work quality index is a bivariate index.

Only respondents who report part- or full-time employment are included in the work quality index. Those respondents who are full-time students and unemployed only answered education-based questions during survey administration.

Table 1. Odds Ratios for 21st Century Skills Index/Sub-Indices and Work Quality

21st Century Skills and Work Quality	
	Odds Ratio
21st Century Skills Overall Index	2.058**
Collaboration	0.907
Knowledge Construction	1.048
Skilled Communication	1.002
Real World Application	1.434*
Self-Regulation	0.987
Problem Solving	1.490*
Technology	1.066

Table 2. Odds Ratios for Student Aspiration Index/Sub-Indices and Work Quality

Student Aspiration and Work Quality	
	Odds Ratio
Student Aspiration Overall Index	1.461*
Teacher Support	1.454*
Sense of Belonging	1.158
Student Voice	0.093

Table 3. Correlations of 21st Century Skills and Student Aspiration

Correlations of 21st Century Skill Sub-Indices and Student Aspiration Sub-Indices							
	Collaboration	**Knowledge**	**Communication**	**Real World Application**	**Self-Regulation**	**Problem Solving**	**Technology**
Teacher Support	0.169**	0.213**	0.100**	0.316**	0.356**	0.198**	0.162**
Sense of Belonging	0.229**	0.247**	0.147**	0.300**	0.332**	0.222**	0.237**
Student Voice	0.182**	0.141**	0.060	0.270**	0.267**	0.103**	0.200**