

GALLUP®

Creativity in Learning



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Executive Summary

Amidst ongoing pressure to meet established standards, U.S. schools have embraced traditional forms of instruction that too often lack the personalisation students need to learn and grow. In an increasingly complex world and workforce, today's students must master essential problem-solving and critical thinking skills to be successful in the future despite likely economic disruption. Future jobs — many of which have not even been imagined yet — will require individuals who can develop new, creative ways to address problems. This creation process will not be the result of rote memorisation or repetition, which is today's dominant teaching method, but instead is fostered through creativity in learning.

In 2019, Gallup conducted a nationally representative study to explore the extent to which creativity in learning is being fostered in American classrooms; the extent to which teachers, parents and students value creativity in learning; how creativity in learning is supported by transformative use of technology; and the outcomes they produce.

Based on this qualitative and quantitative research, Gallup finds significant support for creativity in learning and its promise in preparing students to be productive and successful employees and global citizens. Teachers, parents and students report widespread approval of self-directed, project-based learning with the support of new and innovative technology that allows students to learn in new and innovative ways.

The following pages detail key findings from this important research about what teachers, parents and students believe U.S. schools need for students to succeed.

Key Findings

1

Creativity in learning produces positive critical outcomes for students, which are further enhanced when teachers leverage the full potential of technology.

Teachers who often assign creative, project-based activities are more likely than other teachers to say their students display a range of learning and development goals, including building self-confidence, utilising their unique strengths, and developing critical thinking and problem-solving skills. More than 75% of teachers who practise creativity in learning say their students often demonstrate problem-solving skills, versus less than 60% of teachers who use these techniques less often.

Teachers rate project-based, technology-enabled assignments as better for a wide range of student outcomes. For example, more than eight in 10 teachers say projects that incorporate technology in transformative ways are better than traditional assignments for personalising students' learning, giving them ownership over their learning and helping them connect it to the real world.

Students are more likely to experience creativity in learning when teachers use technology in an educational setting to redefine the way they learn — such as through self-directed, project-based activities that integrate multimedia, augmented reality and other digital tools. Teachers who incorporate laptops and tablets in transformative ways are 2.5 times more likely to assign projects that foster creativity.

2

Teachers and parents agree that creativity in learning inspires better outcomes than traditional learning methods.

Asked which learning outcomes are most important, teachers and parents choose cognitive skills related to creativity. To prepare children for the future, teachers and parents value outcomes related to creativity and other forms of cognitive development, such as critical thinking. For example, about half of parents say it is "very important" that their child come up with their own ideas about how to solve problems (51%) and that they try different ways of doing things, even if they might not work (49%). And 64% of teachers and parents say critical thinking is one of students' most important learning outcomes.

Eighty-seven percent of teachers and 77% of parents agree that teaching approaches that incorporate creativity in the learning process have a bigger payoff for students.

3

A majority of parents and teachers do not see the value of standardised testing as a measure of student learning.

Just 13% of parents say it is "very important" that their child learn how to perform well on standardised tests. What's more, just 12% of teachers feel standardised tests are a good measure of student learning. Only 4% of parents and 1% of teachers include "scoring well on standardised tests" among the most important learning outcomes.

Teachers say lesson plans that make transformative use of technology are better for students to connect their learning to the real world (81%), teach critical thinking skills (76%) and retain what they have learnt longer (71%).

4

Students in most classrooms today spend little time on activities that foster creativity.

Although memorisation and repetition are important, this study demonstrates an undue concentration on these processes. A majority of students would like to spend more time on activities that help them see how their learning relates to real-life problems outside the classroom. However, only 26% of students say they often work on projects with real-world applications. Fifty-two percent of teachers say students often work on such projects, suggesting teachers' perceptions don't match those of students.

Further, the research shows students' activities often focus less on creativity in learning, despite its widely recognised value and approval among teachers and parents.

5

A supportive and collaborative culture, training, and autonomy to try new things are key factors that help teachers bring more creativity to learning.

Teachers are more likely to focus on creativity if they feel that school leaders and parents support their efforts. Those who say school leaders give them autonomy to try new things and the training they need to succeed are much more likely to emphasise creativity in learning and to use technology in ways that support that process than those who do not.

Collaboration among teachers fosters creative use of technology: 83% of teachers say they get ideas for incorporating tablets or computers into their lesson plans from other teachers they know personally.

The stakes for students have never been higher, and the direction never clearer — parents and teachers are aligned in believing that when educators embrace creativity in learning and use new technologies in transformative ways, students win.

Unfortunately, too many schools are using traditional approaches or new technologies in traditional ways. This research establishes the need to scale up the number of students who learn in personalised ways to become creative problem-solvers of tomorrow.

2

About the Study



About the Study

Qualifying and quantifying creativity in learning

Gallup conducted qualitative and quantitative research to assess the extent to which creativity in learning is occurring in classrooms nationally, perceptions of this approach, obstacles to implementing it and the role of technology in the process.

In September-November 2018, Gallup researchers visited 12 schools across the U.S. identified as leaders in continuous innovation and creativity-focused learning. The schools were diverse in terms of size, grade levels, geographic location and students' socioeconomic status. The objective was to investigate best practices for fostering creativity in K-12 classrooms.

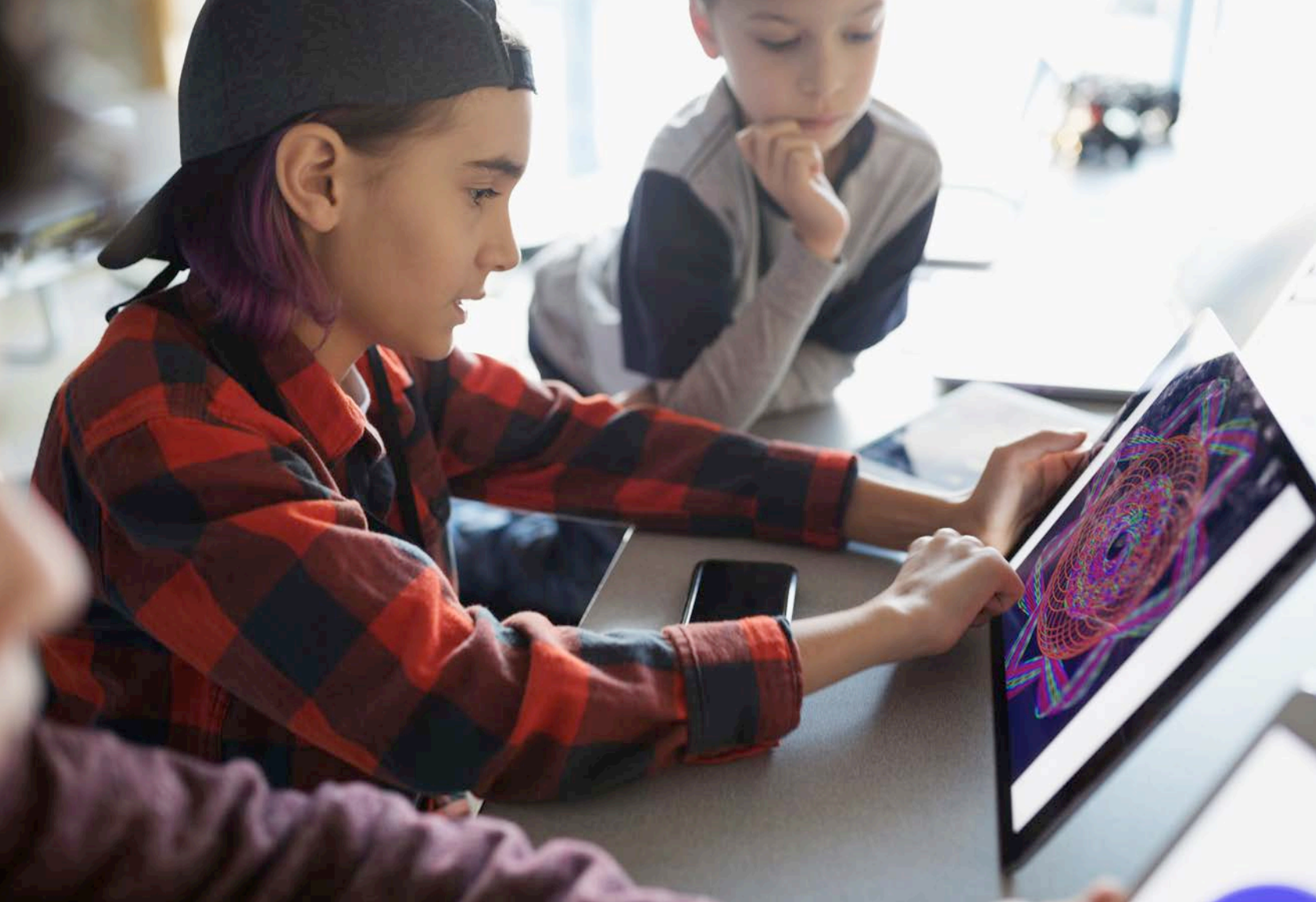
Results from the qualitative research were used to inform the development of quantitative surveys fielded in March and April of 2019 with nationally representative samples of teachers, parents and students. Researchers' goal was to quantify the state of creativity in schools, the relationship between creativity and technology and their perceived impact on student outcomes. For complete methodological details, see Appendix C.

Creativity in learning defined

For this research, participants were given the following definition to establish a common understanding of the study's purpose: "Creativity is the ability to imagine new ways of solving problems, approaching challenges, making connections or creating products. Creativity is not based on a formula, but on thinking that relates to discovery and enquiry".

This definition is reflected in learning approaches that allow students to express themselves in ways that develop critical thinking and problem-solving skills. Teachers who practise creativity in learning use student-centred techniques including project-based assignments that require students to think of their own solutions to problems, as well as self-directed assignments that give students input on what they'd like to learn.

Technology can be used to foster creativity and transform students' learning experiences. This report refers to "transformative use of technology" as using technology in learning activities in ways that open up new possibilities for teachers to deliver information, and allow students to express their learning in ways that they couldn't without the technology. This is in contrast to substitutional uses of technology, which replace traditional tools (paper and pencil) with tablets or computers to do the same tasks, such as filling out a worksheet, taking a multiple-choice test or writing an essay. Substitutional uses of technology do not leverage the full potential of that technology to help students learn in a way that suits them best to draw out their understanding and creative potential.

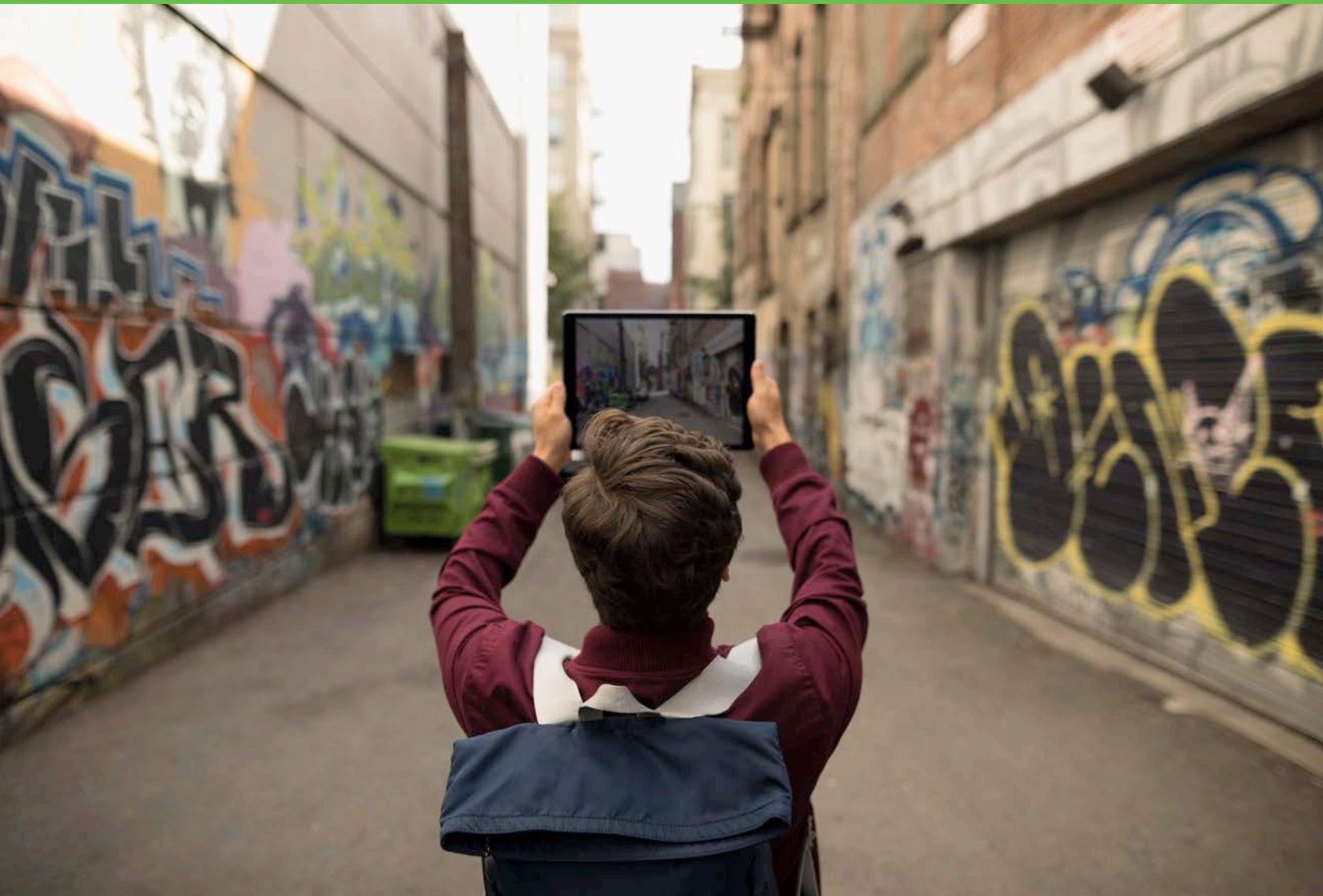


Creativity (n):

The ability to imagine new ways of solving problems, approaching challenges, making connections or creating products. Creativity is not based on a formula, but on thinking that relates to discovery and enquiry.

3

Preparing Today's Students for Tomorrow

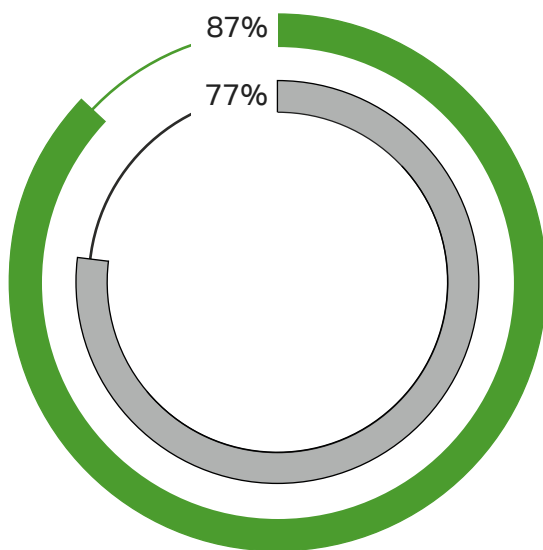


Preparing Today's Students for Tomorrow

When the federal No Child Left Behind Act became law in 2001, U.S. schools mobilised around standards and testing. The general intention was good: Close the gap between high-performing and low-performing schools by establishing state-mandated performance targets to ensure that all students receive an education that meets some minimal standard for quality. What the policymakers who championed standardisation failed to appreciate fully is that the emphasis on test performance and objective assessment would require educators to focus on rote memorisation and repetition.

However, the skills students need to succeed in the 21st century are moving in the opposite direction. In modern, information-rich environments, people need to evaluate and synthesise more data inputs than ever and use them to draw reasonable conclusions. In its "The Future of Jobs Report 2018", the World Economic Forum ranks creativity, critical thinking and problem-solving among the 10 most demanded skills today and into the future.¹ Developing these skills requires a learning process that combines traditional and innovative learning approaches that leverage our best tools, including new technologies.

Teachers and parents believe educational strategies that promote creativity and other higher-order cognitive skills are most important.

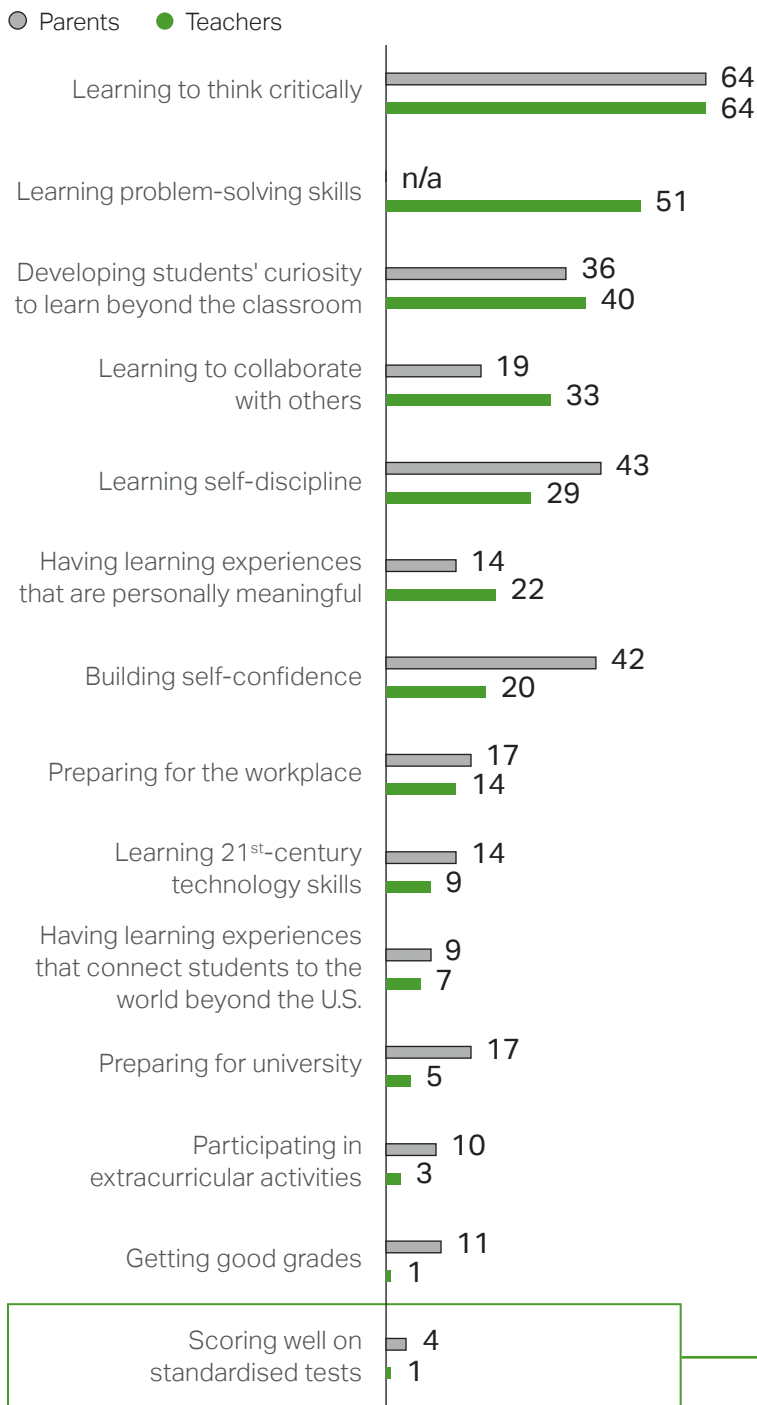


87% of teachers and **77% of parents** agree "Teaching approaches that inspire creativity in the learning process take more work but have a bigger payoff for [students/my child]".

¹ World Economic Forum Centre for the New Economy and Society. (2018). *The Future of Jobs Report 2018*. Retrieved from http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf

Teachers and parents believe critical thinking, problem-solving and curiosity to learn independently are among the most important learning outcomes.

FIGURE 1: Percentage of parents and teachers who rank each outcome among the three most important



When teachers and parents are presented with a variety of learning outcomes and asked to choose the three they consider most important, critical thinking and curiosity to learn independently are among the most commonly selected for both groups, while teachers also frequently name problem-solving skills (Figure 1). Despite the demand for these skills, employers often find them lacking in recent university graduates. A 2018 survey of hiring managers finds significant gaps in importance versus preparedness ratings concerning recent graduates' critical thinking skills, ability to analyse/solve complex problems and their ability to innovate/be creative.²

Even highly practical goals like "preparing for university" and "preparing for the workplace" are less likely to be considered important than the development of cognitive skills that will help students achieve those goals and others throughout their lifetimes.

Only 4% of parents and 1% of teachers include "scoring well on standardised tests" among the most important learning outcomes.

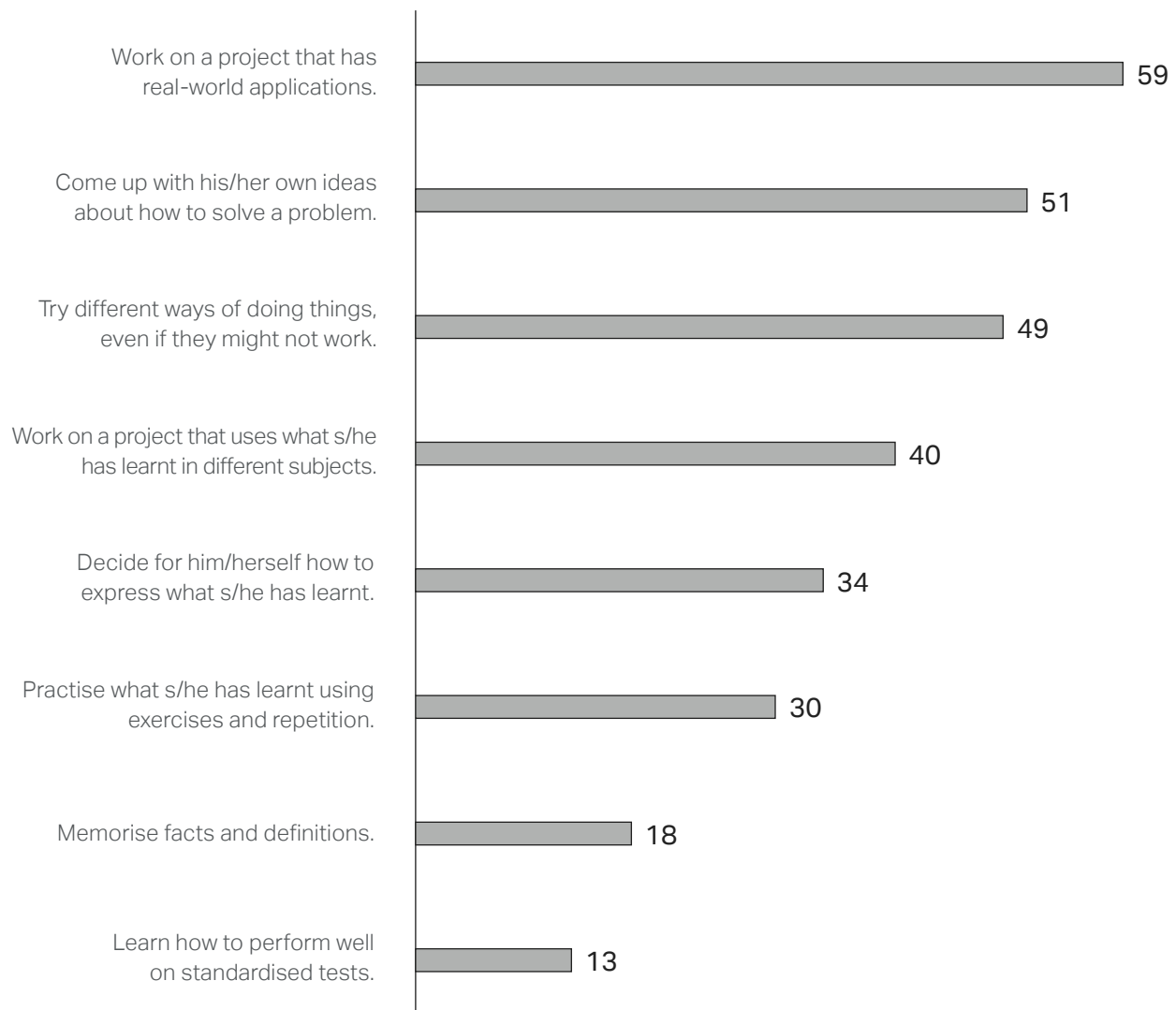
² Gallup. (2018). *Forging Pathways to Purposeful Work: The Role of Higher Education*. Retrieved from <https://www.gallup.com/education/248222/gallup-bates-purposeful-work-2019.aspx>

Parents favour learning experiences that require students to creatively apply what they are learning.

Most parents (59%) believe it is "very important" for students to work on projects with real-world applications. About half also believe it is "very important" that students are creative in addressing problems — including coming up with their own ideas about how to solve them and trying different ways to do so.

FIGURE 2: [Asked of parents] On a scale from 1 to 5, where 5 means it's very important and 1 means it's not at all important, how important to you is it that your child have each of the following learning experiences at school?

Percentage who say "very important"



Repetition and memorisation remain the norm for today's students.

Despite the importance parents attach to assignments with real-world applications, just 26% of students say they often spend time on them. Teachers are more likely to say students often work on such projects (52%), suggesting a disconnect between what teachers believe they are accomplishing and students' understanding of the task at hand. There seems to be a strong need for teachers to convey the real-world relevance of their lessons to students more clearly.

Fifty-two percent of teachers say students often work on projects with real-world applications. However, just 26% of students agree.

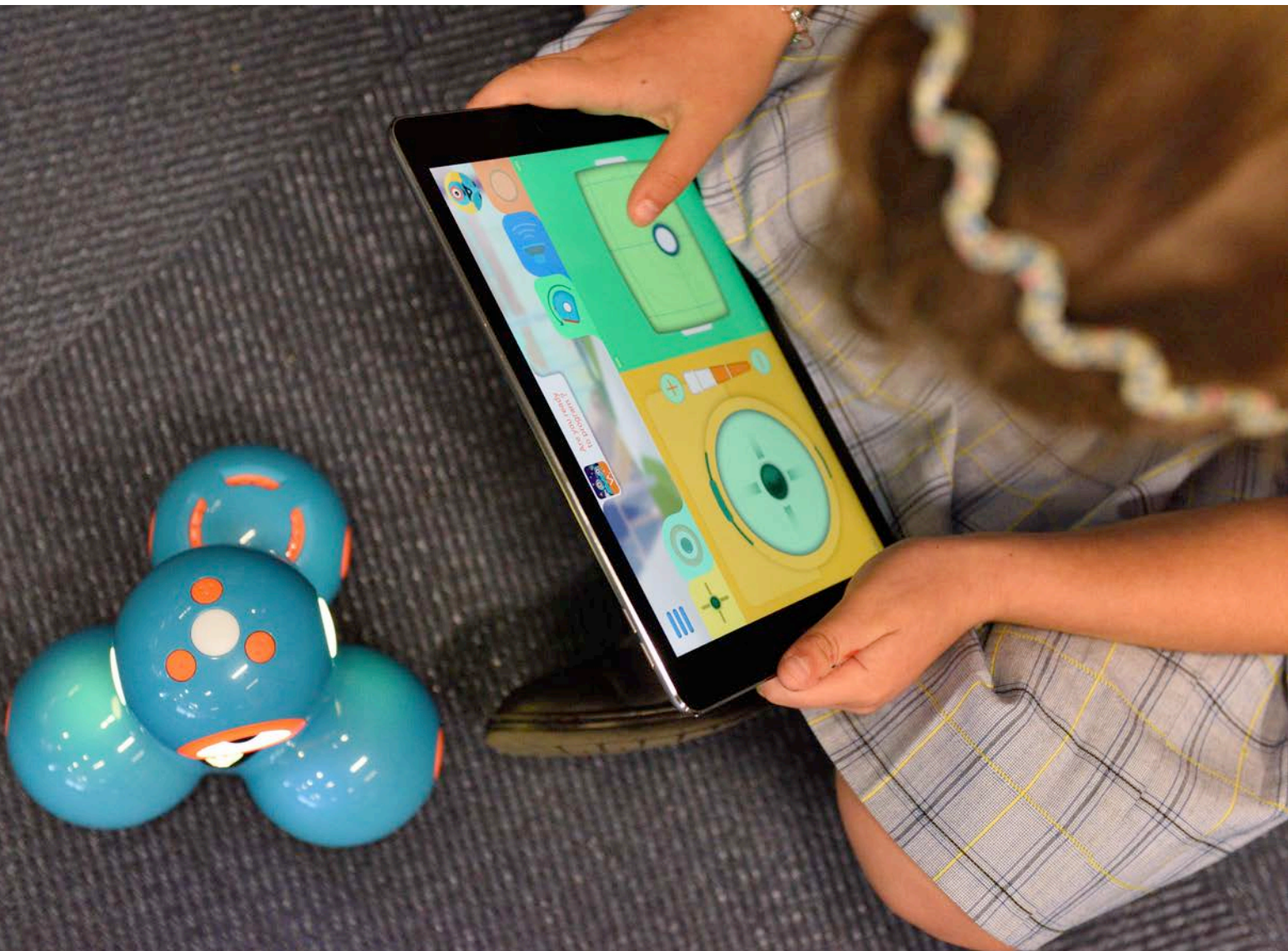
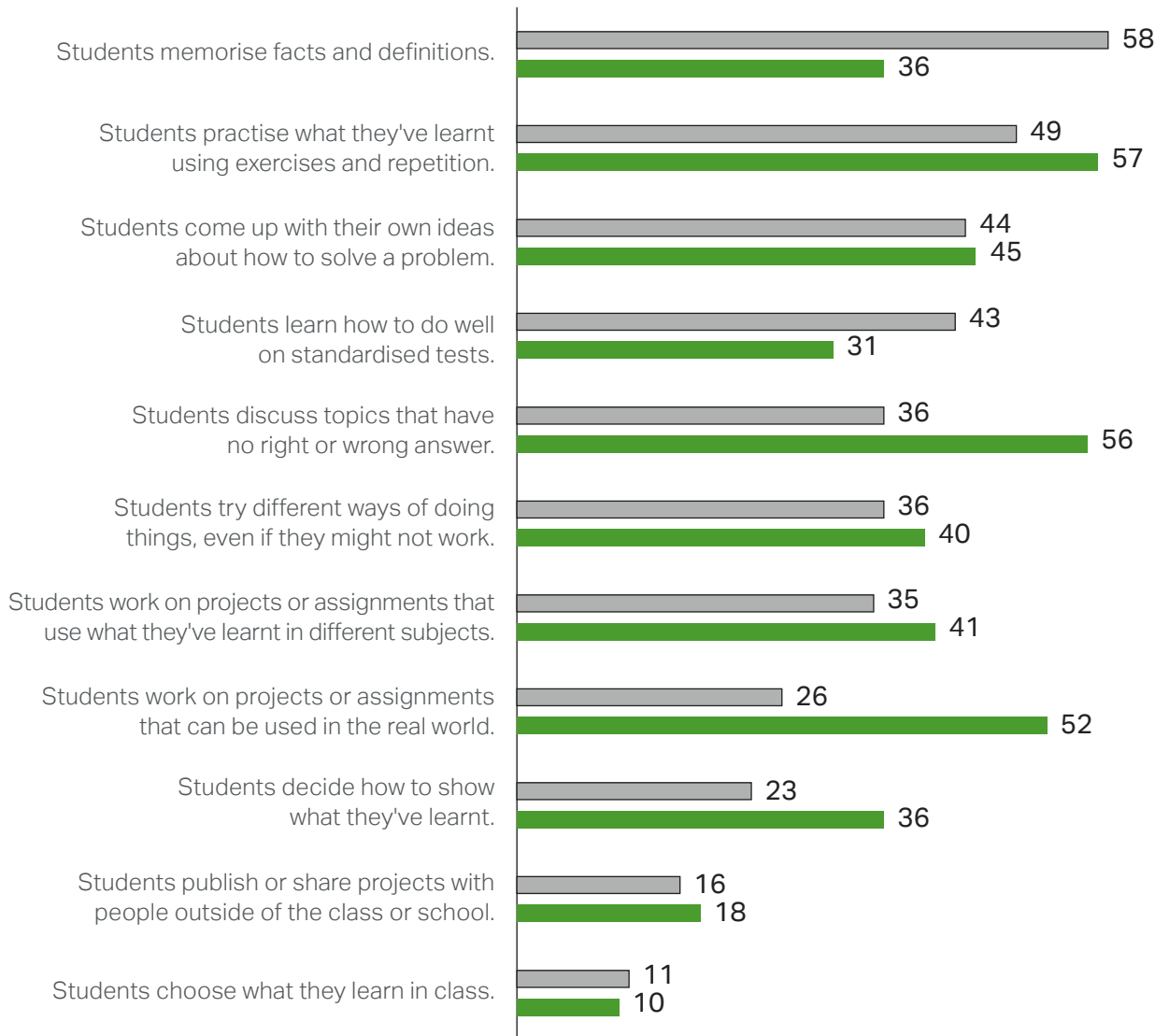


FIGURE 3: How often do each of these happen in school — very often, often, sometimes, rarely or never?

Percentage of students and teachers who say each activity happens "very often" or "often"

● Students ● Teachers



Students are more likely than teachers to say they spend a lot of time memorising facts or definitions — 58% versus 36%, respectively. However, both students and teachers commonly say students often practise what they've learnt using exercises and repetition.

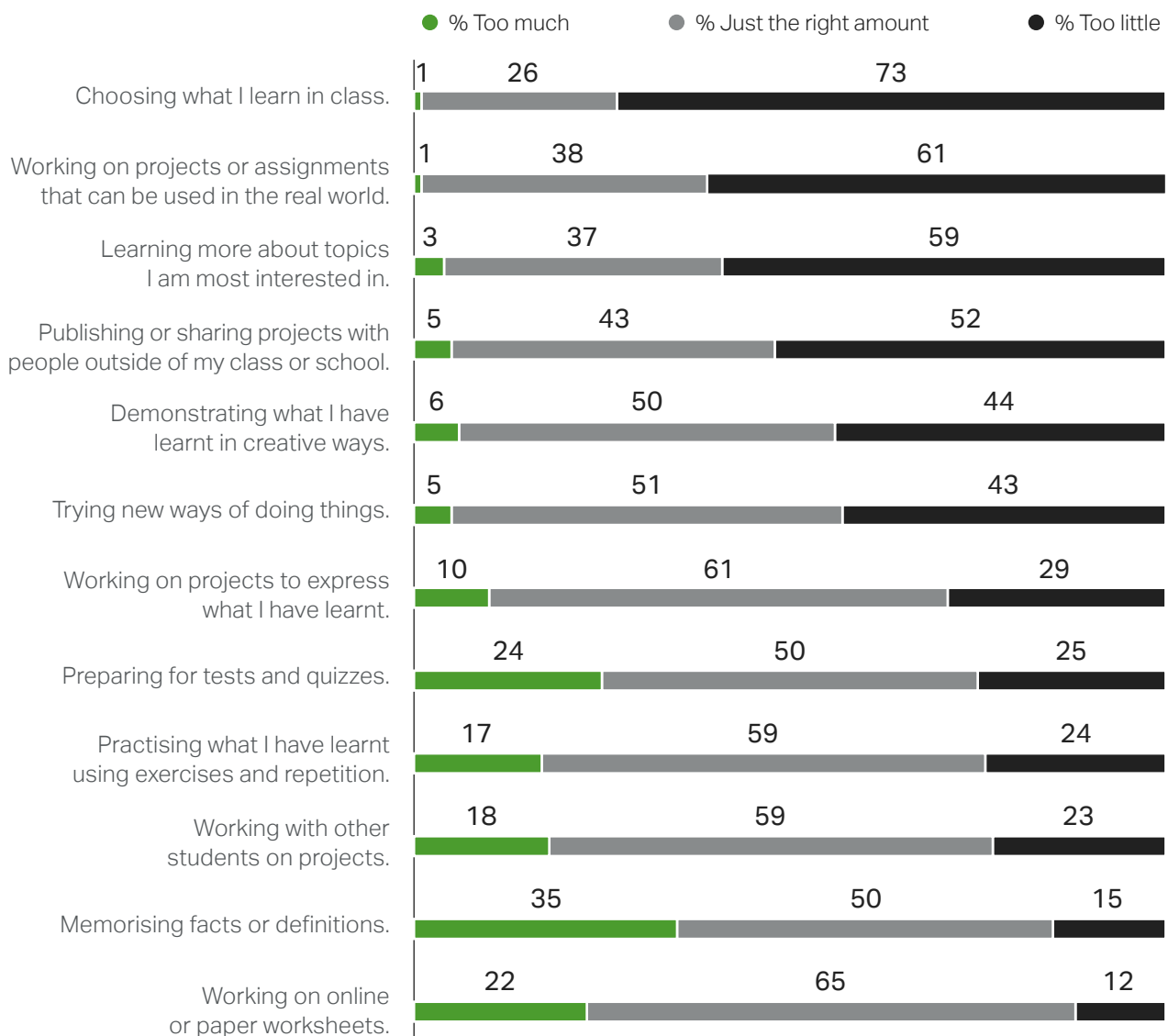
Students and teachers are also similarly likely to say students often come up with their own ideas about how to solve problems (44% vs. 45%, respectively), try different ways of doing things (36% vs. 40%) and work on projects that integrate what they've learnt in different subjects (35% vs. 41%).

Most students say they would like to spend more time on activities that give them input on their educational path, such as choosing what they learn in class and learning more about topics that most interest them.

Two other activities a majority of students would like to spend more time on to help them see how what they are learning relates to real-life problems outside the classroom are 1) working on projects that can be used in the real world, and 2) publishing or sharing projects with people outside their class or school.

Students want to spend more time on self-directed activities and those that connect their learning to the real world.

FIGURE 4: [Asked of students] For each of the following school activities, please indicate if you feel you spend too much time, the right amount of time, or too little time on that activity.



Gallup's in-depth interviews with students and teachers demonstrate how such activities help keep students actively engaged in learning. One seventh grade student described how the self-directed video assignments in her science classroom encourage further investigation of topics students are most interested in. "[Our teacher] lets us choose what topic to make the video on and research the topic as much as we want to for the video — so you get to learn a lot about a topic". After completing the assignment, students watch all the videos to learn from each other's work.

With countless online communities, content-sharing sites and apps that help them put their work into a publishable format, students now have opportunities to share their learning and creativity with the world outside the classroom. As one teacher said, "That need for people to see their work is something that's really strong in [students]. It's shifted their thinking to 'I want my work to have a purpose and be used', as opposed to 'I want to make a 93 instead of a 91'".

“

That need for people to see their work is something that's really strong in [students]. It's shifted their thinking to 'I want my work to have a purpose and be used', as opposed to 'I want to make a 93 instead of a 91'.

— Teacher

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4

Technology's Role in Creativity in Learning



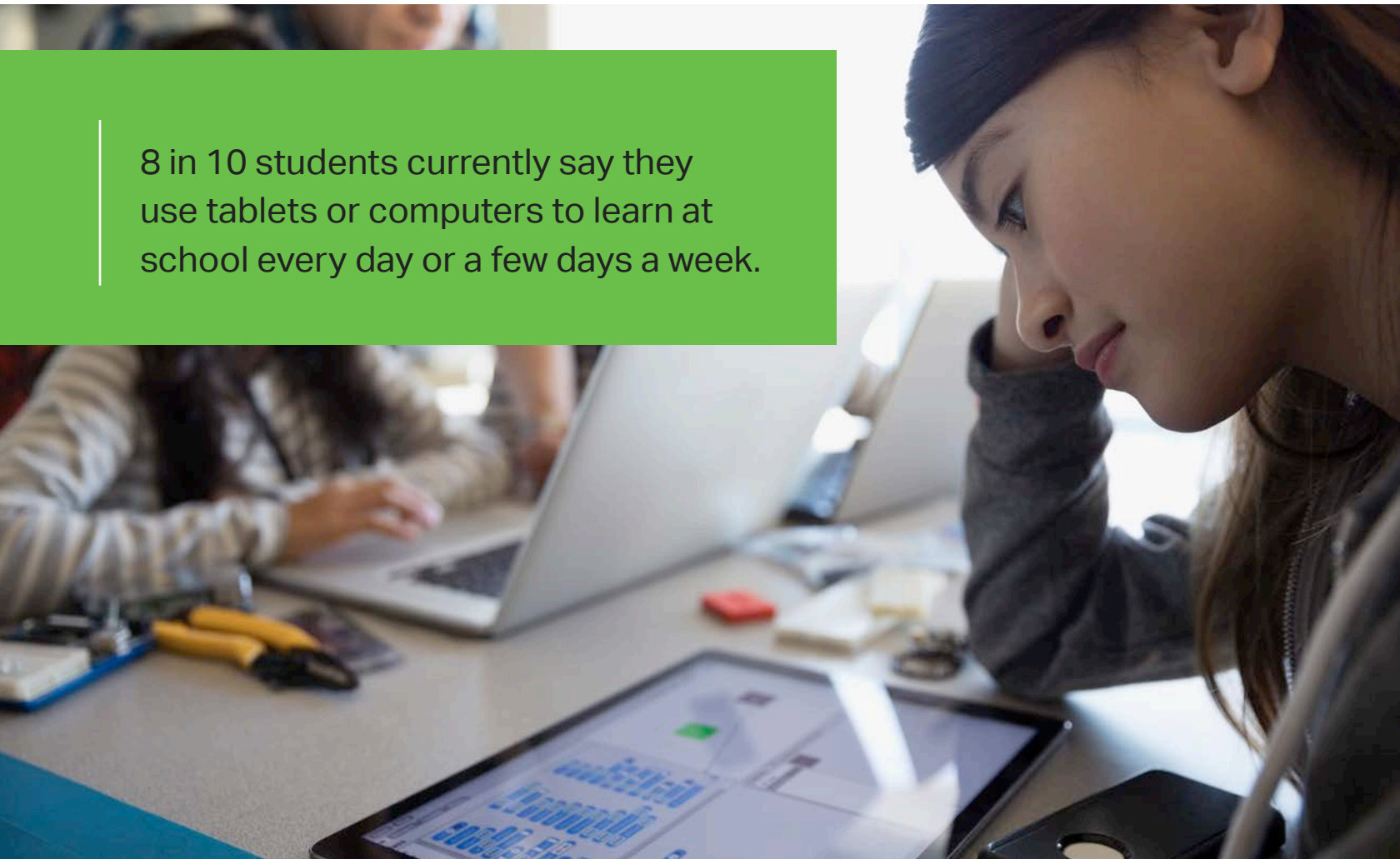
Technology's Role in Creativity in Learning

The accelerating pace of technological change places an additional onus on schools to help students develop skills they need to succeed. That means not just familiarising them with digital technology but providing self-directed experiences that build students' creative capacity to apply it in novel situations. Gallup finds that educational technology helps teachers address both goals if it is widely accessible to students. In visits to schools across the country that use "one-to-one" technology models, researchers saw students using their tablets and laptops for a wide variety of engaging experiences, from designing rocket cones to interactively exploring a virtual Buddhist temple.

Technology is widespread but mostly used to conduct traditional tasks that could be accomplished with other tools.

U.S. schools have made significant strides in making technology accessible to children (see Appendix A). Over the last 20 years, many school districts have adopted "one-to-one" student computing models whereby each student has access to a laptop or tablet computer to use during the school year. About eight in 10 students currently say they use tablets or computers to learn at school either every day (51%) or a few days a week (30%).

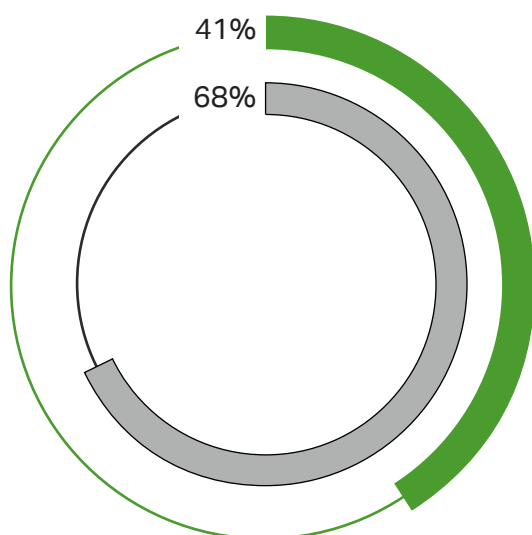
8 in 10 students currently say they use tablets or computers to learn at school every day or a few days a week.



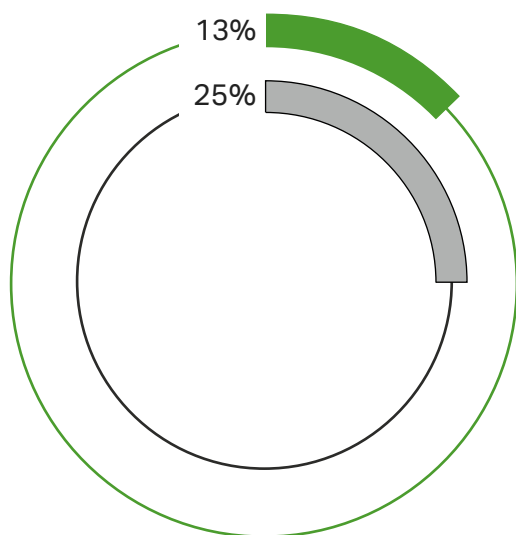
Though technology access is widespread, its utility is limited when educators do not use it to its full potential. Teachers and students are most likely to say they often use tablets or computers for activities that are less likely to include creative aspects, such as writing papers, keeping track of assignments and taking conventional tests or quizzes.

Such tasks fail to harness technology's potential to more fully engage students and promote deeper thinking by changing the nature of their learning activities. The use of laptops and tablets in ways that modify or redefine learning processes — such as working on multimedia projects or experiencing things outside the classroom they could not otherwise experience — are significantly less common.

Technology in schools is not being utilised to its full potential.



41% of teachers and **68% of students** say students often use technology to write papers.

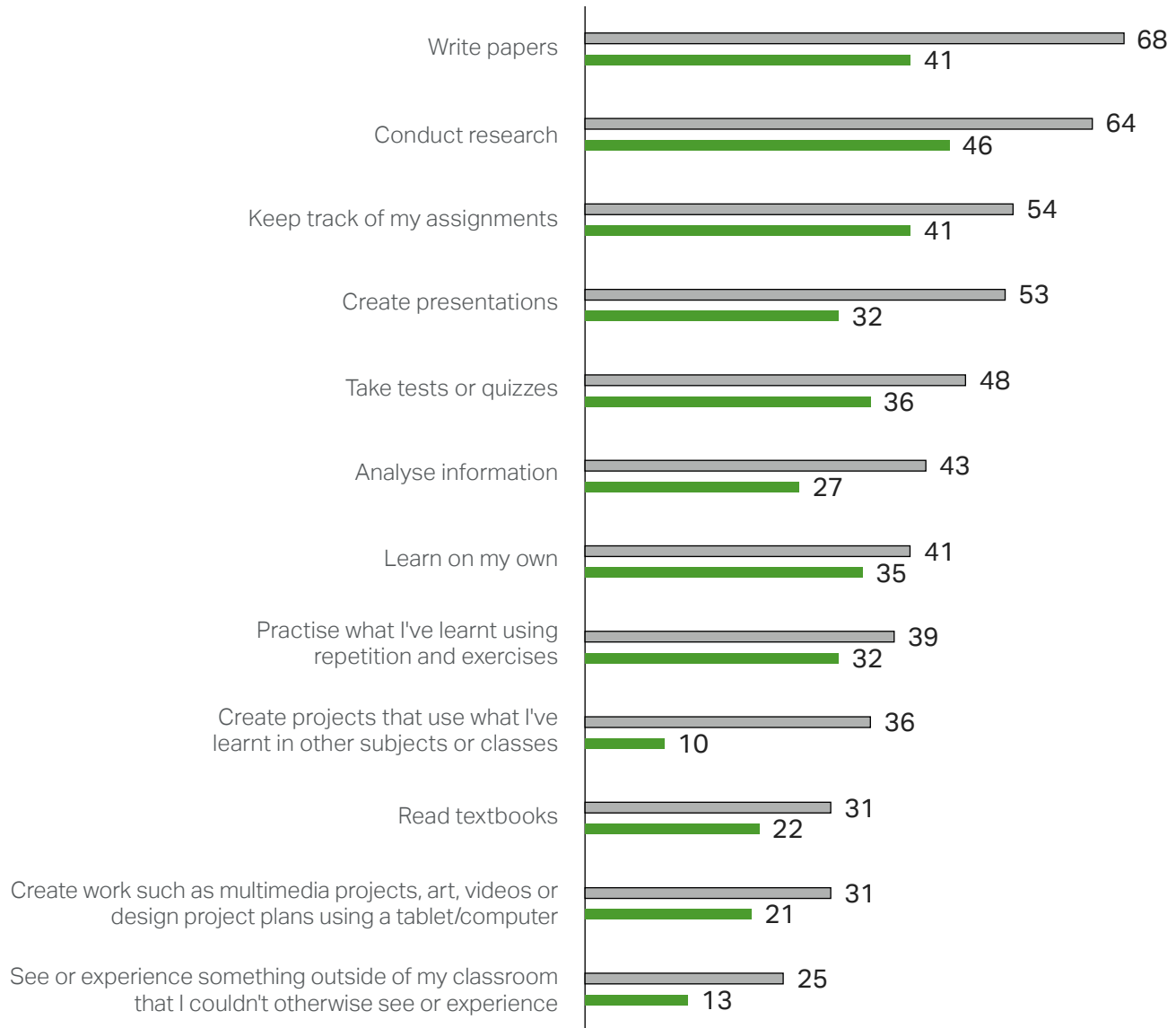


Just **13% of teachers** and **25% of students** report using technology to see or experience something they otherwise could not have.

FIGURE 5: How often do your teachers ask you to do each of the following using a tablet or computer for school?

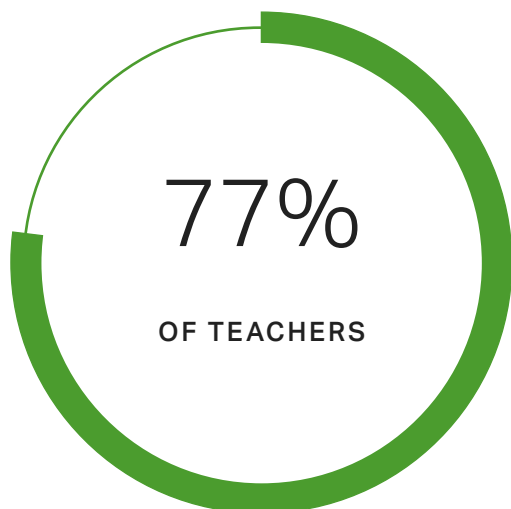
Percentage of students and teachers who say each activity happens "very often" or "often"

● Students ● Teachers

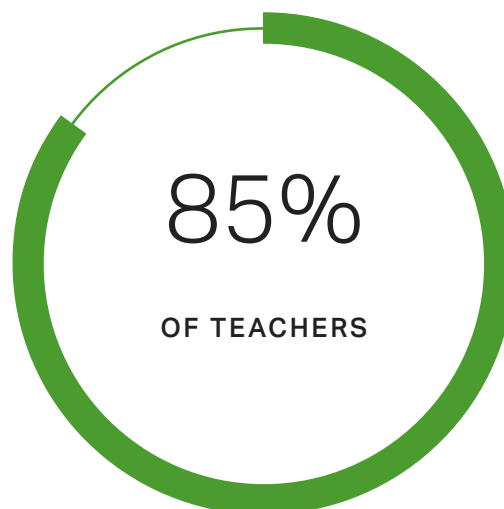


Teachers who practise creativity in learning and use technology in transformative ways are most likely to see positive student outcomes.

More than three-quarters of teachers (77%) agree that students learn the most when they can creatively express what they know. Gallup created two summary measures — one that gauges teachers' emphasis on creativity in learning, and one that measures the extent to which they use technology in transformative ways — to quantify how teaching approaches impact what students learn. (Appendix B lists the survey items combined to produce each measure.)



More than three-quarters of teachers agree that students learn the most when they can creatively express what they know.



85% of teachers who score highly on both creativity in learning and transformative technology use say their students often demonstrate problem-solving skills.

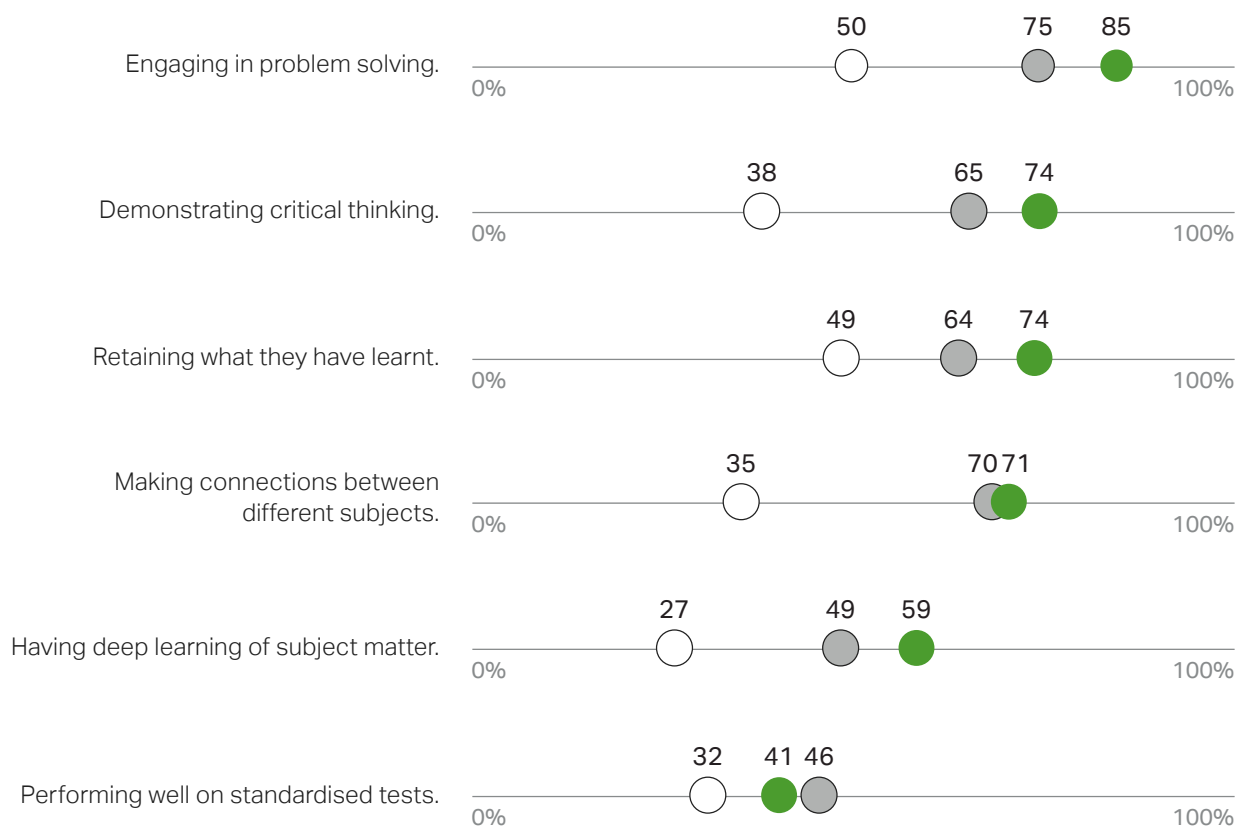
Teachers whose students experience creativity in learning are more likely to report positive outcomes for five of six cognitive skills. Eighty-five percent of teachers who score highly on creativity in learning and make transformative use of technology say their students often demonstrate problem-solving skills, versus 50% of all teachers who do not score highly on creativity in learning. Less than half of teachers overall say their students often demonstrate critical thinking, the outcome considered most important by both teachers and parents. However, that figure rises to 65% among teachers who score highly on creativity in learning but use technology in substitutive ways, and 74% among those who focus on creativity in learning and transformative technology use.

The results are similar for student outcomes related to confidence-building. For example, while 38% of teachers in the low-creativity group say students often use their unique strengths, this figure rises to 65% among those who focus on creativity in learning but make substitutive use of technology, and 82% among those who focus on creativity in learning and use technology in transformative ways. The large gap speaks to the greater emphasis in creativity-focused learning on self-directed activities that allow students to explore their interests and approach projects in ways that are most natural for them.

FIGURE 6: Percentage of teachers who say their students demonstrate each cognitive skill "very often" or "often"

Results segmented by teachers' level of focus on creativity in learning and their use of technology in substitutional vs. transformative ways

- Lower focus on creativity, regardless of technology use
- Higher focus on creativity, substitutional technology use
- Higher focus on creativity, transformative technology use



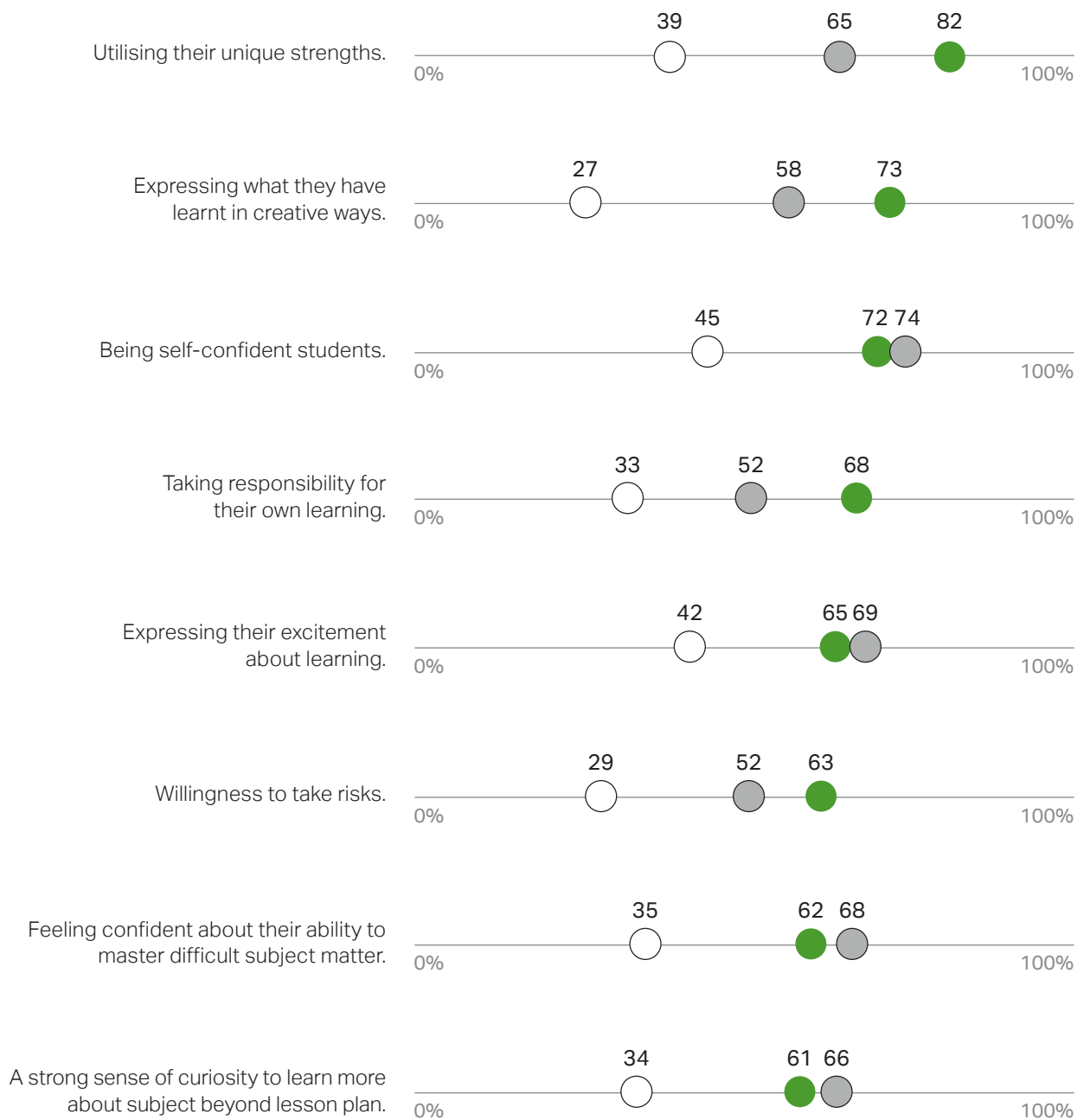
In Figure 6 and Figure 7, differences of 8 percentage points or less are not statistically significant at the p<.05 level.

How to read: The first graph indicates that 50% of all teachers who place less focus on creativity in learning say their students often engage in problem-solving. This figure rises to 75% among teachers who more often assign creative activities but use technology mostly in substitutive ways, and 85% among those who assign creative activities and use technology in more transformative ways.

FIGURE 7: Percentage of teachers who say their students demonstrate each sign of confidence-building "very often" or "often"

Results segmented by teachers' level of focus on creativity in learning and their use of technology in substitutional vs. transformative ways

- Lower focus on creativity, regardless of technology use
- Higher focus on creativity, substitutional technology use
- Higher focus on creativity, transformative technology use



In Figure 6 and Figure 7, differences of 8 percentage points or less are not statistically significant at the p<.05 level.



Teachers who maintain high-creativity environments are more likely to say their students often show signs of cognitive development and confidence-building. In most cases, those outcomes are even more likely when teachers use technology in transformative ways that support creativity.

In general, the results show that educational technology is not *in itself* the main driver of improved student outcomes — its impact comes primarily in helping teachers reorient around more active forms of learning that build students' creative capacity. Teachers whose students use laptops and tablets in transformative ways are 2.5 times more likely to practise creativity in learning. That makes separating the effects of creativity and technology use difficult because creativity supported by transformative technology use is most likely to help students achieve positive learning outcomes.

Teachers believe assignments that require transformative use of technology are more effective.

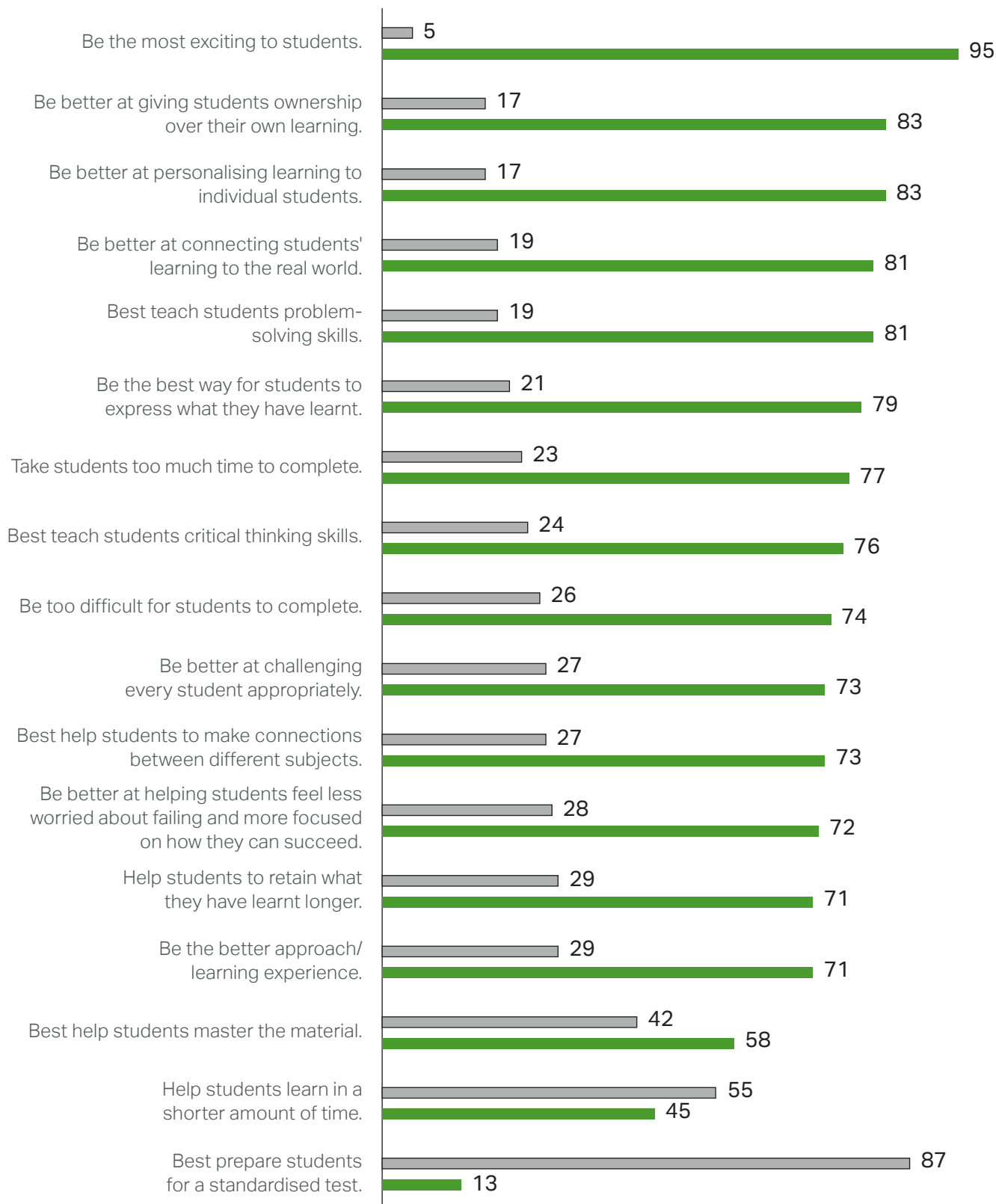
Gallup finds teachers prefer lesson plans that foster creativity through the transformative use of technology over those that use more traditional methods. Gallup presented teachers with two lesson plans — both addressed the same subject matter, but one included a traditional assignment, such as a report or presentation, while the other included an assignment made possible only by using students' laptops or tablets, such as a video blog or interactive book.

Creativity supported by transformative technology use is most likely to help students achieve positive learning outcomes.

Teachers were more likely by far to say the technology-centred assignment would be better for almost all outcomes (Figure 8) — more than eight in 10 said it would be better for personalising students' learning, giving them ownership over it and helping them connect it to the real world. The only item for which teachers strongly favoured the traditional lesson plan was preparing students for a standardised test. However, many teachers also felt that the assignment that incorporates transformative technology use would take too much time to complete or be too difficult for students.

FIGURE 8: [Asked of teachers] Please think about the two lesson plans as you answer the following questions. Which plan would _____?

● % Traditional lesson plan ● % Lesson plan with transformative technology use



Students also recognise the advantages of using technology in ways that give them a sense of ownership and engagement in the learning process. Students are far more likely to say tablets and laptops are better than to say traditional tools are better for most objectives, including:

- giving them opportunities to try or experience new things (69% tablets and laptops vs. 4% for traditional tools)
- making it easy to have their work seen and heard by others (63% tablets and laptops vs. 10% for traditional tools)
- helping them learn more in a short amount of time (58% tablets and laptops vs. 15% for traditional tools)
- making them feel like they're in charge of how they learn (52% tablets and laptops vs. 14% for traditional tools)

One school technology specialist summed up in an in-depth interview how technology is used to fully engage students: "From our experience, [technology] gives students a voice. [At our school], they have the power to influence at any level".

Teachers favour assignments that embrace creativity in learning and using technology in transformative ways. Teachers say these assignments are more likely to give students ownership of their learning and make learning more personalised.

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From our experience, [technology] gives students a voice. [At our school], they have the power to influence at any level.

— *Technology Integration Specialist*

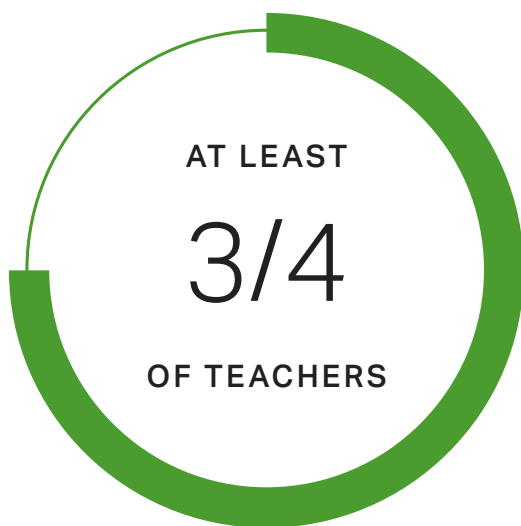
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By allowing [students] to be creative, you see a new level of learning take place. They are more invested in whatever they are learning.

— *Technology Integration Specialist*

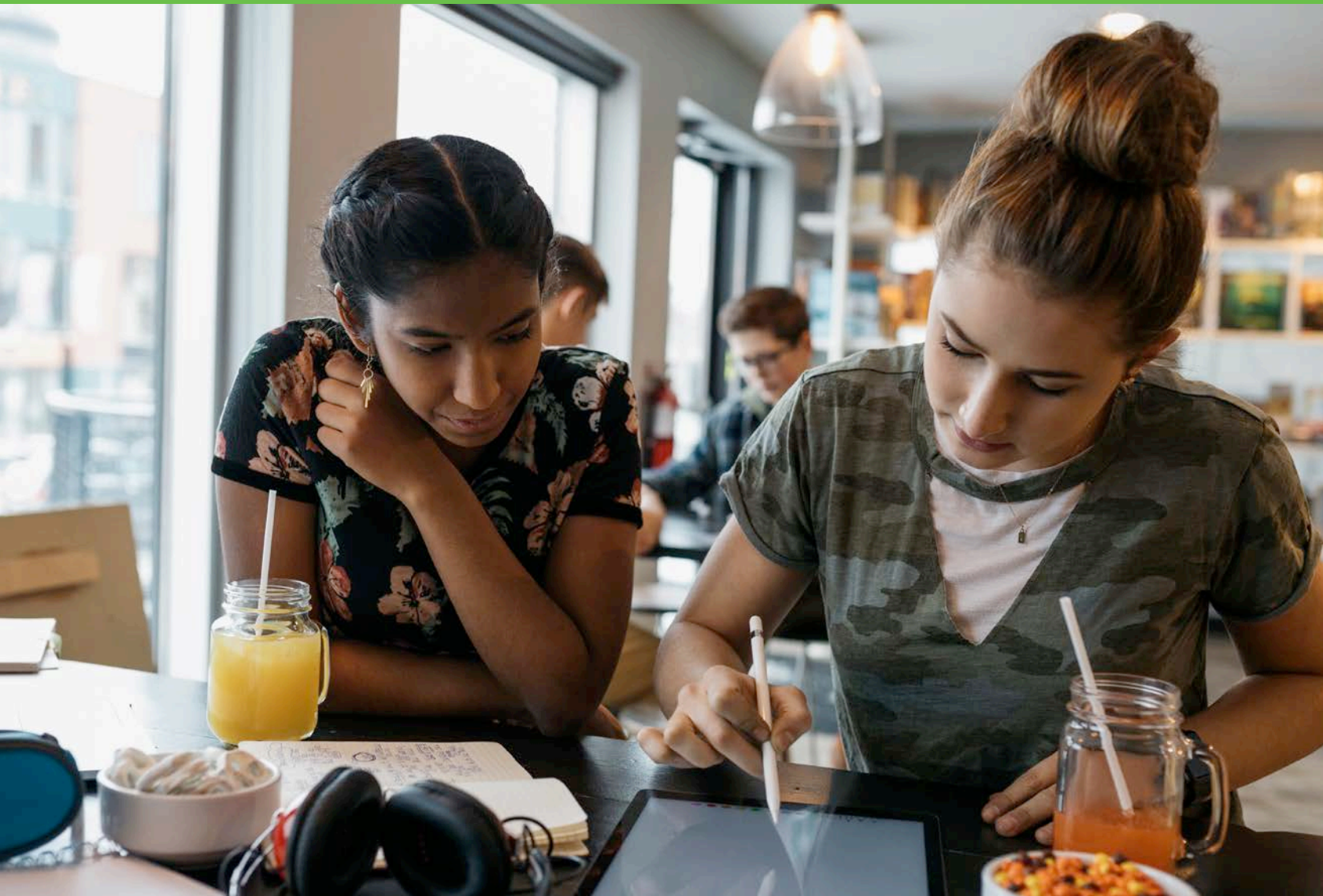
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At least three-quarters of teachers say the technology-based lessons are more likely to help students develop critical thinking and problem-solving skills, and to help them connect their learning to the real world.

5

Factors to Infusing Creativity in Learning

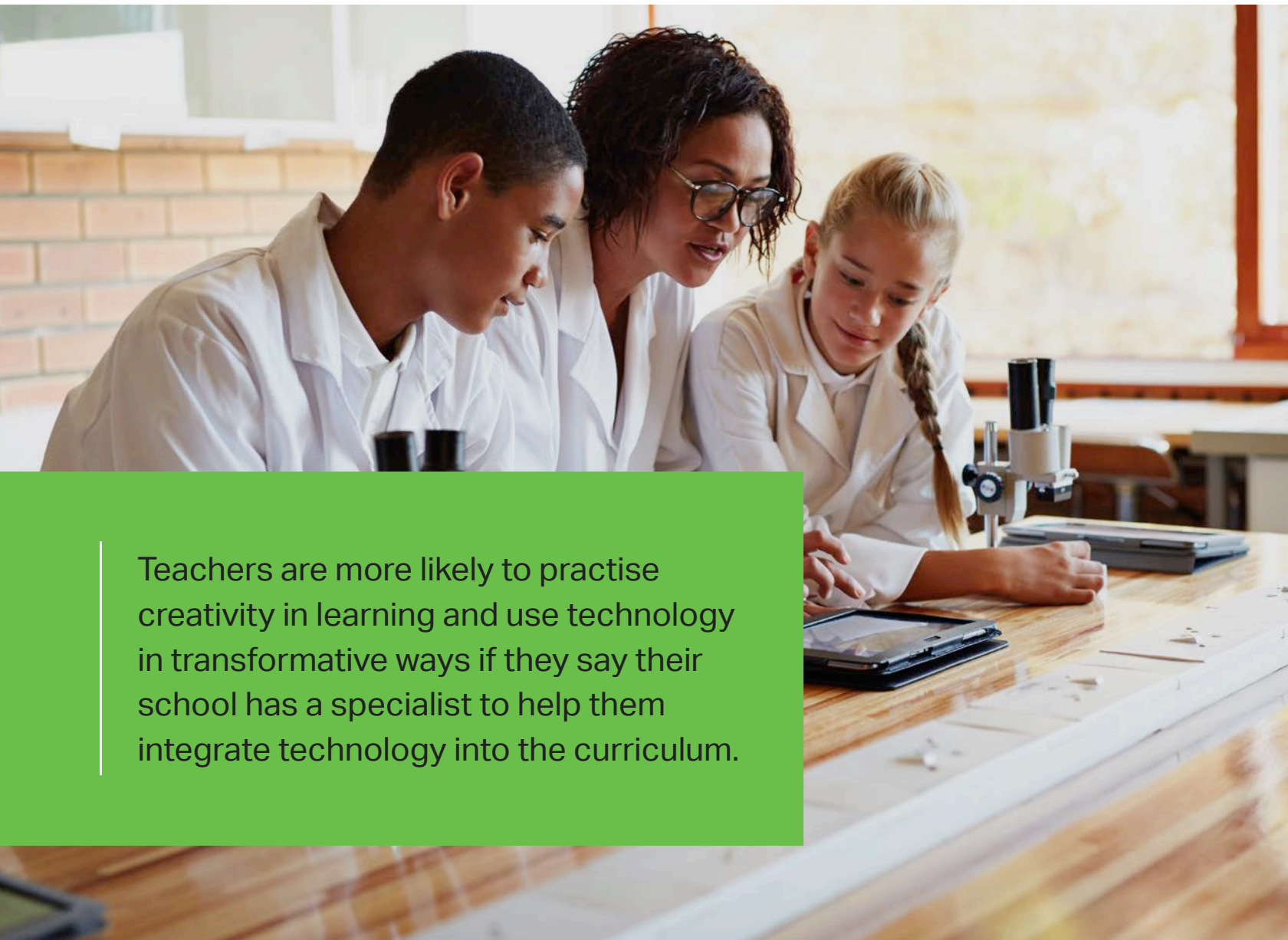


Factors to Infusing Creativity in Learning

To support U.S. schools' efforts to better meet students' needs, education stakeholders need to better understand the conditions in which students are most likely to experience creativity in learning, as well as the most significant barriers teachers face in helping them do so.

Teachers' use of education technology is strongly related to support from school leaders and parents.

In trying new things, both teachers and students rely on a culture of trust, safety and strong relationships, with the understanding that failure is part of the arc of learning. Gallup created a summary measure based on 11 questions gauging teachers' perceptions of support for innovation and technology use from school leaders and parents (listed in Appendix B). Teachers who score in the top-third on this "supportive school environment" measure are more likely than those who do not to say their students often have learning experiences that help develop creativity.

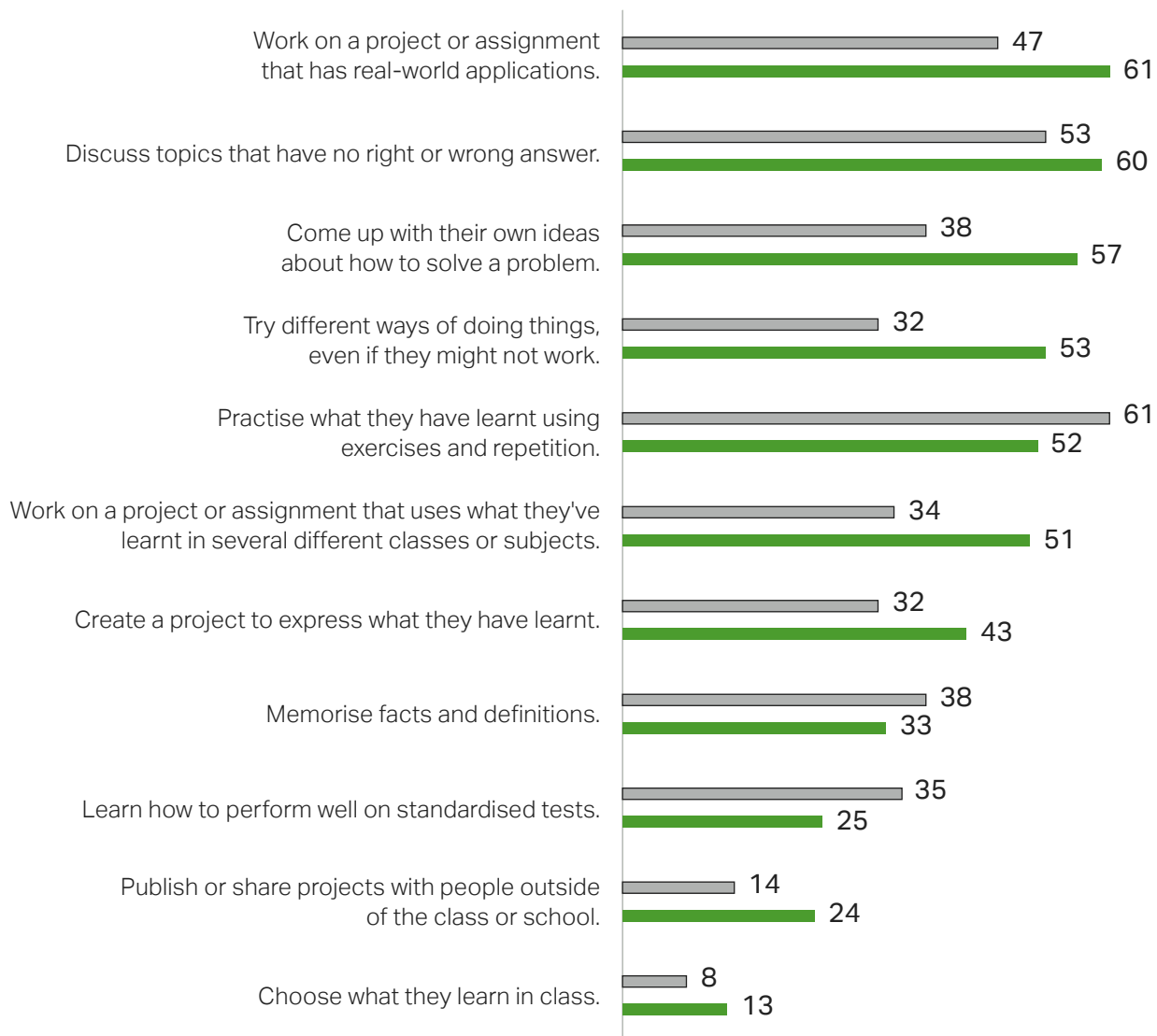


Teachers are more likely to practise creativity in learning and use technology in transformative ways if they say their school has a specialist to help them integrate technology into the curriculum.

FIGURE 9: [Asked of teachers] How often do your students have the following learning experiences in your classroom?


Percentage who say "very often" or "often"

● Bottom 2/3 on supportive school environment ● Top 1/3 on supportive school environment



Collaboration is the foundation for creativity in teaching and learning.

School culture can foster creativity by being highly collaborative and providing a supportive environment for knowledge- and idea-sharing among teachers and students. Unfortunately, just 18% of teachers strongly agree that they leverage the creativity of their peers, while 38% agree somewhat.



Effective classroom technology use facilitates collaboration among students. Both teachers and students highlight students' ability to work together as critical for creativity in learning.

Among its other benefits, collaboration among teachers fosters classroom technology use; when asked where they have gotten ideas for incorporating tablets or computers into their lesson plans, 83% of teachers cite recommendations from other teachers they know personally. That easily tops the percentages who name internet searches (71%), workshops/conferences (57%) or any other source.

Collaboration among students is also crucial in helping them develop creative capacity. In sharing their ideas with their classmates and receiving feedback, students practise divergent thinking, i.e. considering different ways to approach problems. Students also mention software like Apple's Keynote and Google Docs as tools they routinely use to share work and collaborate on projects.

Teachers who say school leaders give them autonomy are more likely to practise creativity in learning and integrate technology at high levels.

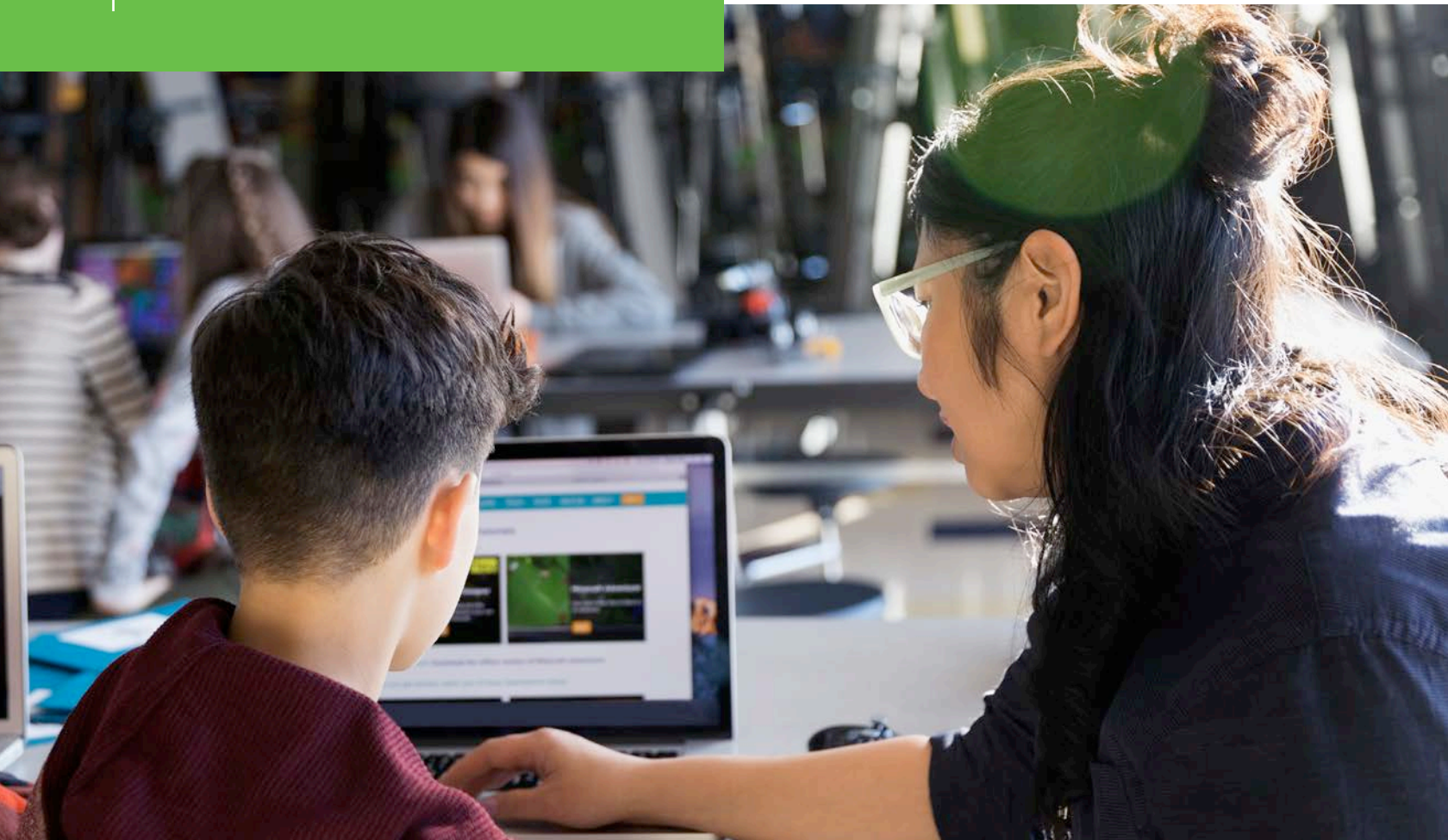
Teachers and administrators frequently note that when teachers feel free to be creative, students see the creative process modelled and are more likely to embrace challenges that require creativity of their own.

Despite the national emphasis on standardised curricula that began in the early 2000s, most teachers do not feel curricular choices are out of their hands; overall, just 28% agree that their curriculum for the semester is set and they can make few changes, while 50% disagree. Moreover, two-thirds of teachers say "give teachers autonomy to try new things with their lesson plans" describes leaders at their school at least somewhat. That's good news, as teachers who agree that school leaders give them autonomy are more than twice as likely to focus on creativity in learning than those who disagree.

Creativity in learning and transformative technology use can be found within both public and private institutions as well as among teachers of all lengths of tenure.

Teachers in the study also often view student autonomy as important for building creative capacity. Making education more student-centric means giving students greater freedom to learn about topics that interest them and to choose how to express what they've learnt. But these can be challenging goals for teachers under traditional education models: About four in 10 teachers and students say students often take responsibility for their own learning, and only about one in 10 say students often choose what they learn in class.

Gallup finds that teachers' likelihood to embrace creativity in learning or to use technology in ways that support creativity doesn't vary much by their specific circumstances such as the grade level, subjects they teach or their tenure in the classroom. Similarly, there is little difference in these measures based upon school characteristics, such as urban versus rural community, public versus private school, or school size. The only exception is that teachers who serve low-income students are less likely to score highly on the creativity in learning measure, though not on the technology use measure.



6

Barriers to Expanding Creativity in Learning With Technology

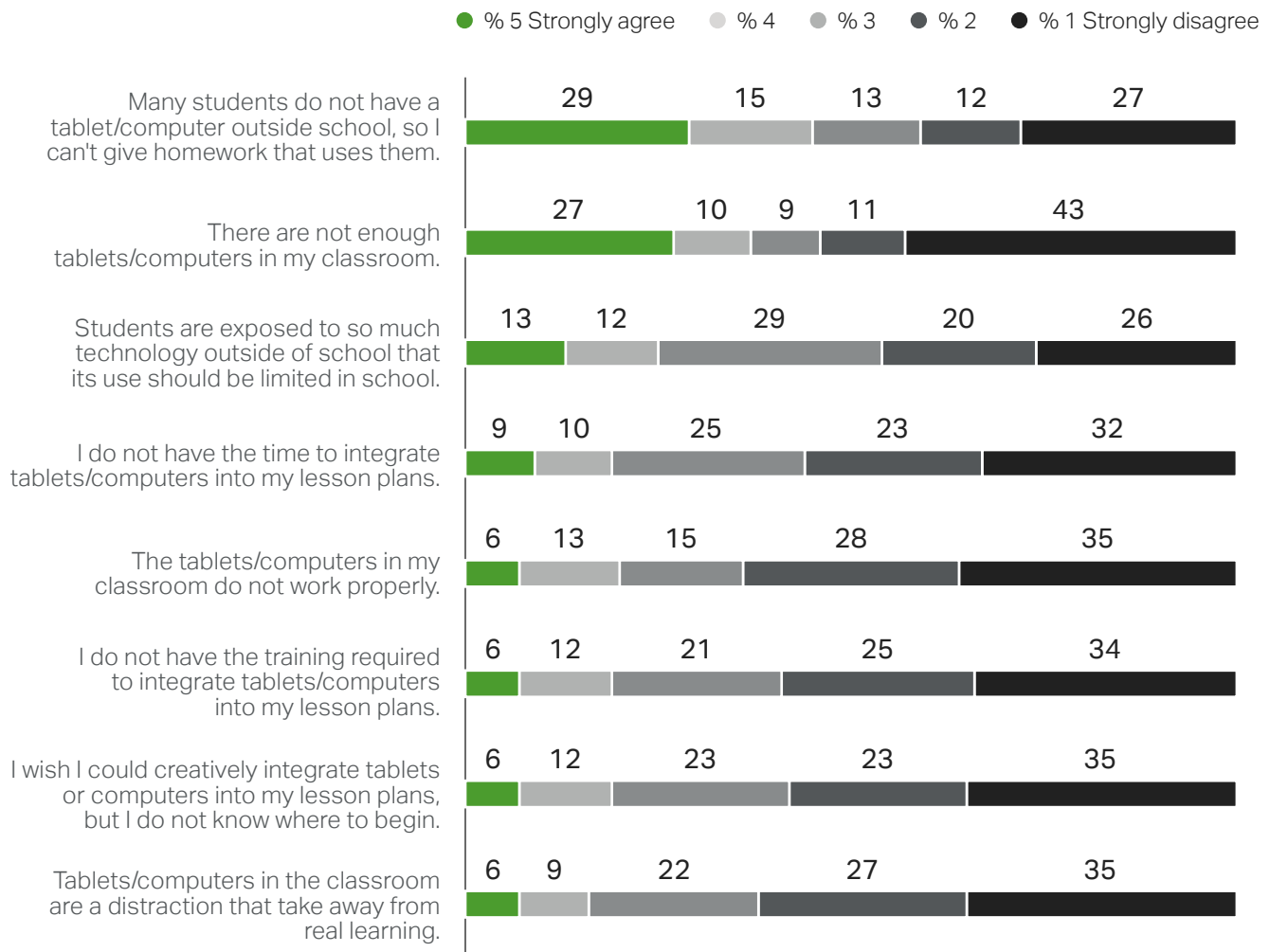


Barriers to Expanding Creativity in Learning With Technology

Access is the most commonly named barrier to education technology use.

When teachers are asked directly about potential barriers to making greater use of tablets and computers for creativity in learning, their most common response is that many of their students do not have a tablet or computer outside of school (Figure 10). Overall, 44% of teachers express at least some agreement with this statement, followed by 37% who agree that they do not have enough tablets or computers in their classroom. No more than one-quarter of teachers agree with any of the other "barrier" statements listed.

FIGURE 10: [Asked of teachers] Please indicate your level of agreement with the following statements.



Teachers' likelihood to agree with these items on access to technology varies widely by students' household income. Among teachers whose schools serve mainly low-income students, 66% say many of their students lack access to tablets or computers outside of school, versus 23% of those in schools with middle-income students and just 11% of those in schools with high-income students. Teachers with mainly low-income students are also twice as likely than those with high-income students to say they do not have enough tablets/computers in their classroom — 42% versus 20%.

“

I see a noticeable impact on student engagement, [but] I don't know if our assessments have caught up to measuring creativity.

— Teacher

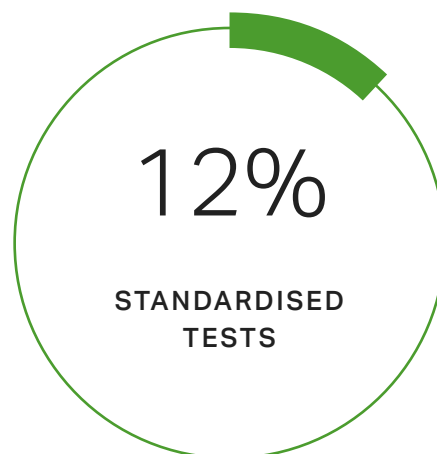
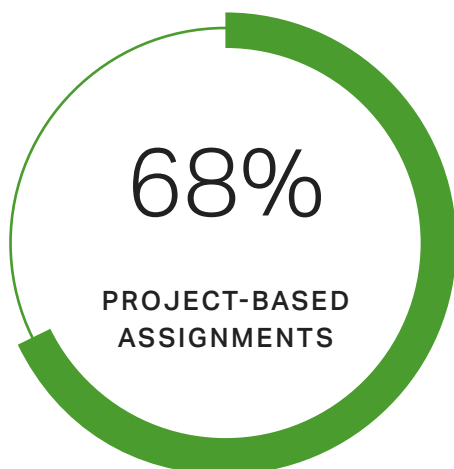
”

Traditional assessments prevent creativity and keep technology at the "substitution" stage in many classrooms.

Gallup finds the standardised nature of traditional assessments presents a significant barrier to creativity and is one reason technology use is stuck at the "substitution" stage in many classrooms. As one teacher in the study explained, "I see a noticeable impact on student engagement, [but] I don't know if our assessments have caught up to measuring creativity".

Portfolio- and project-based assessments are becoming more common ways for teachers to provide a cumulative portrayal of students' learning and development that includes less quantifiable aspects such as creativity. Parents also favour more well-rounded ways to gauge students' progress; 63% prefer that teachers use portfolio-based assessments over test scores to measure student comprehension, while 11% prefer traditional tests.

68% of teachers say project-based assignments are a good measure of student learning — far more than the **12%** who say the same about standardised tests.



However, portfolio-based assessments can be more time-consuming than tests and require more subjective judgement on the part of teachers. Such challenges may help explain why school administrators have been slow to embrace them; just 20% of teachers say their school leaders place more emphasis on portfolio-based assessments than test scores.

“

I know specifically what will be looked at in the AP test. I do it the way the College Board says even though I know other ways to teach it. If the teacher can't express themselves, how can you make students?

— Teacher

”

About a third of teachers agree either that they do not have enough time or enough training (or both) to integrate tablets or computers into their lesson plans. Even at the more technology-rich schools researchers visited, some teachers felt that they did not have enough training on how to make the best use of classroom technology. Others noted that designing creativity-focused lesson plans requires more planning time than reusing existing traditional plans.

30% of teachers agree that lack of time and training are significant barriers to creativity in learning and technology use.

“

I need to feel more confident in certain aspects of creativity. In the past year, we had innovation days for teachers [led by innovation specialists]. It wasn't a training, but we had opportunities to engage with tools and learn how to use them.

— Teacher

”

Both concerns support an assertion made in the U.S. Department of Education's "National Education Technology Plan" that for teachers to fundamentally change how they do their jobs to make effective use of new tools and pedagogical approaches, they need "continuous, just-in-time support that includes professional development, mentors and informal collaborations".³

3 Department of Education Office of Educational Technology. 2017 National Education Technology Plan, p. 28.

Implications

This study paints a vivid picture of the advantages of creativity in learning observed by teachers, parents and students. All three groups agree that, to the extent that U.S. schools are moving away from extreme standardisation and towards more personalised, student-centred teaching approaches, they are heading in the right direction.

The research also points to lingering obstacles about such changes. Though teachers and parents are aligned on the benefits of creativity in learning, some worry that project-based learning may be harder for students and more time-consuming for teachers. Ongoing reliance on tests and quizzes may also slow the transition to more personalised, project-based learning — particularly if parents and school leaders have doubts about alternatives to traditional assessments.

However, such concerns may fade as more schools see the improved outcomes associated with technology-supported instruction that fosters creativity. Technological advances are already leading to new forms of embedded and real-time assessments which, like portfolio-based assessments, provide more well-rounded and frequent input than traditional tests. Parents and educators alike favour alternatives to high-stakes testing, pointing to the potential for grassroots pressure on policymakers to remove a systemic barrier to more personalised, student-centred teaching approaches.

This study demonstrates the need for education leaders to communicate a compelling vision of how their schools must adapt to better prepare students to meet the challenges of the future.

Most importantly, this study demonstrates the need for education leaders to communicate a compelling vision of how their schools must adapt to better prepare students to meet the challenges of the future — and of technology's role in accomplishing that goal. Critically, that vision should start with a common awareness of how traditional teaching practices must change to better support the development of creativity and other vital cognitive skills. That understanding will assure teachers that they have support from leaders to try new things and give them a set of overarching objectives that guide their use of technology to transform students' learning experiences.

Implementing such a vision will not always be easy in the face of influences that tend to preserve the status quo. But as this study makes clear, changes that improve critical student outcomes are already happening in many of the nation's schools, leading the way to a future in which all schools are better able to help students achieve their creative potential.

7

Appendix



Appendix A: Access to Technology in U.S. Schools

Gallup's qualitative research found teachers and students incorporating technology into lessons in many ways, from designing rocket cones to interactively exploring a virtual Buddhist temple. However, these schools were selected as examples of those that excel in creativity-focused instruction supported by technology use. Gauging how common these activities are among all U.S. schools was a primary goal of this study and was achieved in the quantitative surveys of teachers, parents and students.

Eight in 10 students currently say they use tablets or computers to learn at school every day (51%) or a few days a week (30%). Many districts provide schools with access to technology specialists that help teachers integrate this technology into the curriculum. Almost half of teachers (47%) say their school has such a specialist, with results generally consistent across grade levels.

The teacher survey also included questions about how students access technology and the type of device primarily used.

Most say students primarily use laptops (59%) or tablets (22%); just 9% say students use desktop computers and 8% say their students do not have access to any type of computer for learning.

About half of teachers (49%) say students have tablets or computers that are theirs to use full time during the school year — either provided by the school (34%) or brought from home to use for school (15%). Among high school-level teachers, these figures rise considerably, so that about eight in 10 say students have personal devices for full-time use. Teachers at the primary school level (K-5th grade) are more likely to say students use devices that remain in the classroom.

Notably, schools in more affluent areas often have an easier time achieving "one-to-one" status, simply because students are more likely to bring their own devices from home. Among teachers who say their schools serve mostly high-income students, one-third (33%) say students bring devices from home for school use, versus 11% among teachers whose schools serve low-income students.

[Asked of teachers]: Which of the statements below describes how students access devices, such as computers, laptops or tablets, at your school?

Please select all that apply.

	All teachers	K-5 th grade	6 th -8 th grade	10 th -12 th grade
Students go to library or other room to use a tablet/computer.	34%	37%	26%	35%
Students share tablets/computers that remain in each classroom.	43%	51%	38%	33%
Students share tablets/computers carted between classrooms.	32%	30%	28%	33%
Students are given tablets/computers that are theirs to use during the school year.	34%	28%	41%	43%
Students bring their own personal tablets/computers from home to use for school.	15%	3%	14%	36%

Appendix B: Summary Measures

This study uses three summary indicators for teachers' focus on creativity in learning and transformative technology use, and the extent to which they perceive a supportive school environment. The survey items included in each of these composite measures are listed here. Gallup tested the items in each composite measure to ensure high levels of statistical reliability.

Creativity in learning

How often do your students have the following learning experiences in your classroom?

- A.** They choose what they learn in class.
- B.** They try different ways of doing things, even if they might not work.
- C.** Come up with their own ideas about how to solve a problem.
- D.** Discuss topics that have no right or wrong answer.
- E.** They create a project to express what they have learnt.
- F.** Work on a project or assignment that uses what they've learnt in several different classes or subjects.
- G.** Work on a project or assignment that has real-world applications.
- H.** Publish or share projects with people outside of the class or school.

Transformative technology use

How often do you ask students to do each of the following using a tablet or computer for school?

- A.** Analyse information using a tablet/computer
- B.** Conduct research using a tablet/computer
- C.** Create presentations using a tablet/computer
- D.** Create work such as multimedia projects, art, videos or design project plans using a tablet/computer
- E.** Create complex projects that cross disciplines using a tablet/computer

Supportive school culture

Please rate how well these statements describe [leaders/parents] at your school.

- A.** Leaders at my school are resistant to change.
- B.** Leaders at my school are primarily focused on test scores.
- C.** Leaders at my school place more emphasis on using portfolio-based assessments instead of test scores as a way of measuring student comprehension.
- D.** Leaders at my school give teachers autonomy to try new things with their lesson plans.
- E.** Leaders at my school have embraced students using technology in the classroom.
- F.** Leaders at my school provide me with the training I need to succeed.
- G.** Parents at my school are resistant to change.
- H.** Parents at my school prefer using portfolio-based assessments instead of test scores as a way of measuring student comprehension.
- I.** Parents at my school are supportive of new ways of teaching.
- J.** Parents at my school have embraced students using technology in the classroom.
- K.** Parents at my school are highly engaged with what's happening in the classroom.

Teachers whose composite scores fall in the top-third of all teachers for each measure are said to be in the "high" group for creativity in learning, transformative technology use or supportive school culture.

Appendix C: Methodology

Qualitative research phase

In the fall of 2018, Gallup conducted 12 school visits across the country to identify the characteristics of creativity in learning and investigate how technology can impact this learning, as well as what barriers are present for its implementation in classrooms. During each visit, researchers observed instruction across a variety of subjects and asked students informal questions about their participation in specific activities. To complement these observations, Gallup also interviewed teachers, parents and administrators about their views of creativity in learning and how technology is utilised in the classroom.

Gallup selected schools that were diverse in terms of size, control, geographic location, socioeconomic status and grade-level representation. Eleven of the schools employed "one-to-one" technology models with Apple devices (MacBook or iPad), and one school employed a "one-to-one" technology model using Google Chromebook devices.

Quantitative research phase

In March and April 2019, Gallup conducted web-based surveys of teachers, parents and students to quantify creativity in schools, the relationship between creativity and technology, and their impact on student outcomes. The three surveys were conducted via the Gallup Panel™. The Gallup Panel is a probability-based panel of approximately 100,000 U.S. adults, of whom the majority are web-based panellists. All panellists are selected via random-digit-dial (RDD) or address-based sampling (ABS) to ensure that the panel is representative of the entire U.S. adult population.

For the parent and student surveys, Gallup randomly selected parents who Gallup anticipated had a child in grades K-12. Gallup interviewed a total of 2,673 parents of children with at least one child in grades K-12, and 853 students in grades 6-12. Gallup obtained written, explicit permission from parents and legal guardians prior to interviewing children. In households with more than one qualifying child, the programming randomly selected which child the parent should think of when completing the survey.

For the teacher surveys, Gallup interviewed 1,036 full-time, randomly selected teachers who currently teach grades K-12. In a few cases (such as Figures 3 and 5), results from the 6th-12th grade student sample and K-12th grade teacher sample are compared directly. To ensure comparability, researchers verified that findings from 6th-12th grade teachers are not substantively different from those for the full teacher sample.

Results from each of the three surveys were weighted to account for the probability of selection. Gallup also weighted the data to account for nonresponse. Gallup weighted the student sample according to targets from the National Center for Education Statistics (NCES) based on student grade level, race/ethnicity and school type (public vs. private). Gallup weighted the parent sample using targets provided by the Census Current Population Survey based on age, gender, education level, phone status, census region and race/ethnicity. Gallup weighted the teacher sample according to targets provided by the U.S. Department of Education based on gender, age, race/ethnicity, years of experience, school level and school type (public vs. private).

All reported margins of sampling error for this study include the computed design effects for weighting.

- For results based on the total sample of students, the margin of sampling error is ± 6.1 percentage points at the 95 percent confidence level.
- For results based on the total sample of parents, the margin of sampling error is ± 2.5 percentage points at the 95 percent confidence level.
- For results based on the total sample of teachers, the margin of sampling error is ± 5.0 percentage points at the 95 percent confidence level.

In addition to sampling error, question-wording and practical difficulties in conducting surveys can introduce error or bias into the findings of public opinion polls.

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