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Using technology in the classroom to better engage students

2022 INDUSTRY REPORT

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"Building a rapport with students and learning with them. Students engagement really motivates me to bring them more new ideas and technology."

Teacher-student collaboration in the classroom: What the research tells us

As a result of the COVID-19 pandemic, educators around the world are rethinking what student engagement means and why it's so important. We also look at the impact teacher relationships have on student performance and identify strategies, environmental considerations, and the technology required to enable effective collaboration.

Five hundred years ago, Shakespeare wrote of a schoolboy `... creeping like snail unwillingly to school.'[1] It's hard to imagine what awaited the poor boy when he arrived because education has changed so much in the time since. But one thing has remained relatively constant: students don't, as a rule, trot eagerly to school.

In 2005, a survey of 81,000 US high-school students confirmed as much. Three-quarters of respondents said the material they were learning was not interesting; two-thirds said they were bored in class every day, and just under one third said they were bored because of a lack of interaction with teachers[2].

There is work needed to capture, nurture, and maintain students' interest in the content they are studying. Student engagement is seen as a priority, and collaboration between teacher and student is seen as a step towards unlocking its benefits.

What is student engagement?

The definitions of student engagement vary, though an engaged student is generally considered to be one who: shows attention to the area of focus, participates actively in learning, and spends the right amount of time on task[3]. Typically, it encompasses three dimensions: behavioral, emotional, and cognitive engagement. Each is influenced by a variety of elements in the learning environment, including the school community, the presence of adult role models, a student's peers, the type of instruction, and the curriculum itself[4].

In the following report, teachers clarified that when they think of student engagement, 61.9% think cognitive, 46.1% think emotional, and 24.7% think behavioral.

What does student engagement research show us?

There is evidence of a strong correlation between engagement and achievement[5]. Of the three types of engagement shown in the section above, behavioural engagement is the most likely to impact results. Studies have shown that the more attentive students are in class and the more time they spend focused on the task at hand, the better they perform[6]. In other words, students who pay more attention in class perform better.

Research has also shown that when students are engaged in the learning process, it increases their focus and attention and pushes them to adopt higher-level critical-thinking skills[7]. The question is, how to encourage them to do so?

What are the benefits of student engagement?

Multiple research studies have shown that students who are engaged not only achieve higher academic results but are also more likely to persist through struggles with their school work, have better social skills, and are less likely to drop out of school[8].

In contrast, disengaged students show lower cognitive performance, disruptive behaviours, and emotional problems. They avoid academic tasks and have increased absenteeism, dropout rates, and problems with learning.

Interestingly, the level of disengagement increases as students grow older. Research suggests that in lower grades, 80 percent of students are engaged. By the time those same students hit high school, that number falls to 40 percent.

There is also evidence that increased engagement can reduce anxiety in college students, particularly when the right active learning practices are implemented. And getting it right is essential; the fear of negative evaluation can raise the heart rates of even the most prepared student when a teacher poses a direct question[9].

Adopting an engaging approach

Governments across the globe have accepted the evidence. The US Department of Education recognises student engagement as a key element in creating a positive school climate and acknowledges its links to academic achievement[10]. In Australia, New South Wales has made clear its preference for cultivating a culture of engagement[11].

In neighbouring state, Victoria, student engagement is mandated in education policy. Each school is expected to have a student engagement policy that supports the creation and maintenance of, among other things, positive and engaging cultures and safe and supportive environments[12].

The trend towards collaboration

To date, there is plenty of evidence that collaboration between teachers leads to better job satisfaction, delivers important emotional and psychological benefits, and improves competence[13]. It has also been shown to have a positive effect on student achievements[14].

The concept of teacher-student collaboration is relatively new. As such, there's not yet a significant body of evidence to support it directly[15]. However, the American Psychological Association makes it clear that students who have 'close, positive, and supportive relationships with their teachers will attain higher levels of achievement'[16]. Research by the University of New South Wales concurs. A 2019 study showed that 'the more positive relationships students had with their teachers, the better their engagement [and participation] in school'[17].

There is widespread acknowledgment that if today's students are to develop the skills needed for future success, there needs to be a shift from knowledge-only education to developing creative problem-solving skills, collaboration, resilience, agility, compassion, and respect[18]. These skills need to be taught and reinforced; something teachers can do by providing opportunities for practice and positive reinforcement[19]. As such, schools, districts, and departments worldwide are embedding collaboration into their approaches to learning.

How schools are enabling collaboration

Good teacher-student relationships are one of the keys to student engagement. Evidence shows that where they exist, students tend to succeed, and teachers can intervene effectively if problems arise[20]. This section looks at which strategies, environmental considerations, and technology solutions are being adopted and addressed.

Strategies

In its Practice Principles for Excellence in Teaching and Learning, the Victorian Government describes a positive climate for learning as one in which the following exist[21]:

- High expectations for every student promote intellectual engagement and self-awareness. This lifts the intrinsic motivation of students and leads to improved outcomes.
- A supportive and productive learning environment promotes inclusion and collaboration. The theory is that when a teacher maintains a safe, supportive and inclusive learning environment, students will be more motivated, collaborative and productive.
- Voice, agency and leadership empower students. When empowered as learners and leaders, actively contributing to their own education and whole-school initiatives, self-efficacy is enhanced. They experience growth in motivation, well-being, and achievement.

According to the George Lucas Educational Foundation, one of the most valuable gifts a teacher can give to their students is time[22]. They recommend a number of strategies to build better relationships, including learning names quickly and correctly to prevent students from feeling marginalised or invisible, assigning seats and changing them often, finding small ways to connect, and simply listening.

US not-for-profit educational organisation, ASCD, adds an important point about content[23]. It is their view that students won't be deeply engaged unless they can find a meaningful use in their lives for the content they are expected to learn. After all, in the words of Harvard Professor David Perkins, `Knowledge is for going somewhere, not just accumulating.'[24]

Environmental considerations

Classrooms have historically been designed for the communication of information from one to many[25]. The teacher is usually positioned front and centre, as are the various media they access. But as schools begin to embrace strategies to improve student engagement in the classroom, the limitations of the traditional layout are becoming apparent[26].

Innovative Learning Environments bring flexibility to teaching and to the use of spaces, furniture, and technology. That's important because there are times when students need specific instructional learning and times where they should be encouraged to collaborate in small or large groups[27].

New school buildings are being designed with collaboration in mind.

In the case of West Lake Middle School—in the Humble Independent School District, Texas—the concept of a `building without walls' led to the construction of unique, functional spaces in which students could really interact and engage.

Similar approaches are being taken to new builds elsewhere. When it constructed a new School of Management, the University of Bath set out to create a space that delivered a 21st Century learning and research environment. The areas it incorporated were designed to enable effective teamwork and support the University's philosophies of engagement, education, and collaboration[28].

Technology

A focus on the right approach and the right environment will only go so far. Today's teacher needs to be far more mobile if they are to collaborate effectively with students. Access to the right technology is therefore essential.

In this report, 82.4% of teachers say they are always moving, 12.2% occasionally walk between desks if there's a reason to, and only 3.2% stay at their desk. Technology needs to be able to support the needs of teachers.

If the whiteboards, data points, electrical sockets, televisions, and projectors are all set up for a teacher to lecture from the front of a class, it is challenging to set the teacher free. As such, making informed decisions about networks and investment in technology is critical.

More and more schools are pushing towards education technology (EdTech). Wireless presentation solutions like Vivi improve teacher productivity and turn the classroom into an interactive, collaborative learning space—driving increased student engagement and productivity.

Not only does the use of systems like this in the classroom provide opportunities for interaction between students, but it also unshackles teachers from the front of the class (82.4% of the the 760 teachers we surveyed say they're always on the move) and allows them to connect with students in a way that their predecessors simply could not.

There is significant evidence that greater student engagement delivers better academic outcomes. In addition, there is a global acceptance that teacher-student collaboration is an effective way to boost student engagement.

The task now falls on schools, education departments, and districts to deliver it by implementing the right strategies, environments, and technology.

Personalized Learning: What is it, and how do you embed it into the classroom?

Everything these days is personalized. Tailoring products and services to the individual is seen by businesses as a way to maintain customer engagement. Educators are increasingly turning to personalized learning as a way to improve student engagement and help K-12 students achieve more in the classroom than they would otherwise. We look at how personalized learning has evolved and what it means for today's students.

The days when we consumed television and radio as a collective are long gone. These days we watch and listen to what we like when we want to.

Companies like Netflix have pivoted their business model to deliver exactly that to our screens. Netflix knows it has just 90 seconds to help viewers find a show before they decide to look elsewhere and it is literally obsessed with personalizing recommendations[1]. The algorithm it has built is now pumping relevant content to more than 200 million people across the globe[2] and produces around $1 billion a year in customer retention[3].

Social media also has its roots in personalization. The algorithms run by companies like Meta and Twitter act as filters to bring users content that really counts. Without this kind of approach, there would simply be too much information for us to navigate. In other words, we wouldn't be able to use them.

In contrast, the world of learning has been slow to adapt. For centuries, there has been a one-size-fits-all approach to teaching. Generation after generation has sat through science, learned languages together, and even endured dreaded sessions of double math. Along the way, some students have fallen by the wayside. Whether it's the subject matter, the environment, or the way the class has been delivered, something just hasn't resonated.

What is personalized learning?

Personalized learning recognizes that all students have different skills, different styles, and different needs.

Not only that, but they are also often at different points of their learning journey[4]. Personalizing the delivery to suit each student gives each an opportunity to succeed.

Though there have been plenty of disagreements about how exactly to deliver personalized learning, the concept has been around for a long time. For decades, schools have wrestled with the problem of how to teach students with different levels of ability[5]. At various points over the last two hundred years, some have developed innovative approaches to try and address the problem—from the Pueblo Plan of the 19th Century through to Dan Buckley's two forms of personalized learning to New York City's School of One[6].

In recent years, the biggest change has been the level of investment into research and the development of technology. The Gates Foundation committed hundreds of millions to support research into personalized learning and, under President Obama, the US Education Department invested half a billion dollars[7].

There is now a critical mass of support from states, companies, philanthropists, non-profit groups, and advocates[8].

What does a personalized learning environment look like?

In a personalized learning environment, the teacher doesn't teach students as a collective in the traditional way. The class is segmented so that each student can receive focused and relevant attention right when they need it[9]. The teacher can then coach each through learning that is tailored to meet their own strengths, skills, needs, and interests. Not only does that bring students up to speed quicker, but it also provides an opportunity to extend them. Perhaps even more importantly, it also keeps pupils engaged[11].

For many educators, adaptive software sits right at the heart of their teaching strategy[12]. Technology like this allows them to adjust the content to suit each student's skill level and also group students with similar abilities together[13]. Others see personalized learning as an opportunity to give students greater freedom when selecting their projects or in the ways they can present the work they have completed[14].

However the school chooses to deliver it, personalized learning ensures that students are able to learn in different ways and at a pace that suits them. The learning journey is, quite literally, tailored to their needs and interests[15].

How is personalized learning delivered?

In Australia, the approach to personalized learning is embodied in what is known as CASE Steps, which assist teachers to plan teaching and learning strategies to meet a diverse range of needs[16].

The CASE Steps to Personalized Learning

Content
Use contents to identify key concepts that align with students' age and/or grade level

Abilities
Take into account the range of students' abilities, current levels of learning, strengths, goals, and interests

Standards
Assess students' progress in relation to achievement standards

Evaluation
Evaluate actions taken to personalize student learning

There are many different ways in which personalized learning is delivered, but there are four key elements that reflect the teaching and learning cycle[17]:

- Assessing the individual needs of the student, which is informed by rigorous analysis of data.
- Providing adjustments to support the needs that have been identified. In the case of students with disabilities, this is done in consultation with parents and care givers and is supported by evidence.
- Monitoring and reviewing the impact of the approach that has been adopted. This ensures delivery methods can be adjusted where necessary to ensure the student's needs continue to be met.
- Consultation and collaboration between teachers, parents, support staff and other professionals, where required.

The benefits of personalized learning

Not everyone is yet convinced of the benefits of personalized learning. There are concerns over the amount of screen time it means for students, the solitary nature of study, and the level of influence the technology industry has over the strategy as a whole[18].

The reliance on technology to deliver it effectively leads some to say it is a corporate approach to learning driven more by the idea of earning money than through an altruistic desire to improve education[19]. Research published by the National Education Policy Center in the US cites a lack of oversight and accountability which, considering the interest of the technology industry and the potentially lucrative new market it now has access to, says is a concern[20].

However, those who advocate for personalized learning cite a number of benefits. According to research conducted by Education Week in 2018, more than half of US school principals felt personalized learning either showed promise or was a transformational way to improve education[21].

Empowerment

Students have a far greater say in their learning than they have ever had before. In student-centered classrooms, they can learn at a speed they are comfortable with and in a way that suits their needs[22].

Engagement

For companies like Netflix, personalized recommendations improve customer engagement. In the classroom, personalized learning does the same for student engagement. It's because of the autonomy, relatedness, relevance, and growth mindset it instills in students[23]. Having made choices and been involved in planning their own learning, students are more invested in their learning journey[24].

Achievement

There is certainly evidence that personalized learning impacts student achievement. Research corporation, RAND, has published results showing that personalized learning equates to a performance lift of around 3 percentile points above the median[25]. It also claims that in both mathematics and reading there is evidence of cumulative growth in students over two years of personalized learning[26].

Personalized learning is not really a new approach. The ideas that are now being implemented have—to a certain extent—been tried in many different ways before, with varying degrees of success.

Although teachers have always had the ability to help individuals better understand the content, what makes personalized learning so interesting in today's classrooms is the way technology can support its use at scale. For the first time, students are now being presented with real choices in the way they can structure their day. And the data produced along the way is enabling teachers to monitor how students are progressing and prompt them to make adjustments, if necessary. It also allows teachers to more accurately group individuals with similar capabilities.

Flexible learning spaces

The advent of flexible learning spaces is unlocking new ways for students to learn at their own pace. Classroom designs now support focused individual learning and also collaborative group work. Screen-mirroring tools like Vivi knit these spaces together and enable both teachers and students to make the most of the modern classroom environment.

The Impact Engaging Technology in the Classroom Has on Learning

Deciding on the most engaging technology in the classroom can be a complex task. This technology consists of a mix of devices and software which teachers use in many ways to conduct a class. Technologies can include anything from tablets, interactive whiteboards, laptops, projectors, collaborative applications, and screen sharing devices, among others.

However, getting to know a little bit about the ways they work and how they impact learning can help you choose the most appropriate systems. Here are some facts from a recent study by McKinsey that will give you more initial insight.

- Some devices have a more significant impact on learning outcomes than others.
- Better grades on PISA (Programme for International Student Assessment, an evaluation created by the Organisation for Economic Cooperation and Development) strongly correlate with the use of projectors and WiFi-enabled computers in the classroom.
- Digital devices can also be helpful to both teachers and students in science classes.
- There is significant evidence that students who use the device exclusively are less likely to achieve success. Teachers must have devices too for optimal learning outcomes.
- Learning improved across the board in schools where there were enough devices connected to a good internet service, faculty had access to adequate software and online support, and teachers had time, expertise, and training to integrate digital tools into the classroom.

According to the same study, technology use should not be random. Instead, it should reflect learning objectives. The chosen tool should be a part of the curriculum as well, meaning not all technologies apply to all classrooms. Adapting lesson plans to utilize technology better will require support for teachers, and teachers should use technology themselves instead of allowing students to use it on their own.

This gives you a better idea of why installing technology in the classroom should be thought through carefully so that teachers and students get the most out of the experience. The following discusses the general benefits of this technology.

Advantages of Engaging Technology in the Classroom

While not all classroom instruction should be through technology, engaging technology in the classroom is ideal for many types of curriculum. Education Week recommends teachers establish times for technology, planning for the "technology-integrated portions" of the lessons, particularly as teachers and students become more confident in using the technology. Once they do, these are the benefits they will likely experience:

They help keep positive relationships between students and teachers

For your classrooms, you need technology that promotes a sense of closeness and participation.

It is essential that they feel connected and motivated in learning, as well as be able to interact easily. The secret of engaging technology is that it allows inclusive, collaborative learning.

They work with students who learn in different ways

Every student learns and retains information differently. Teachers can use technology to differentiate their instruction to accommodate the learning abilities of their class members. Furthermore, students can work at their own pace when utilizing this medium.

They help students become more independent

The prevalence of technology in everyday life has made it its own academic subject. Many careers use the software on a daily basis: From document editors and spreadsheets to internet browsers and email clients, engaging technology in the classroom lets students exercise these skills and get ready for their professional lives ahead.

Besides positive learning outcomes, your school can enhance its reputation when leveraging the advantages of this technology. Read on for common uses for engaging technology in the classroom, hinting at the best solution for your school.

How Can Teachers Use Engaging Technology in the Classroom?

There are many creative ways to use technology in the classroom. The point is to get the suitable device and software to produce the desired outcomes. Here are some ideas that are possible with a leading wireless screen sharing and student engagement platform.

Sharing a webpage with the entire class

Sometimes, only a webpage conveys specific information teachers want to show to their students. Why not share it straight from the source with the whole class? The most up-to-date technology solution can allow teachers to share any website from any device to all students' screens.

Raising hands

Students can send a digital alert instead of physically raising their hands. This lets teachers know they want to participate, while students can continue working in class until the teacher calls on them. Using a market-leading solution, you and other admins can monitor student engagement in real-time through classroom participation metrics.

Buffer-free video sharing

Video sharing will be effortless for your school's teachers since buffering, and poor performance will not interrupt classes. A platform that integrates with video management systems and allows direct video play within an app is ideal. As a teacher plays video to a shared screen on their own device, everything else doesn't need to stop because they can keep working privately on their device.

Wireless presentation sharing

A modern wireless presentation solution allows teachers to move freely around the classroom without any limitations. They can control the screen from any place in the room while also interacting with students, resulting in more learner involvement.

Allow for student-controlled presentation

Students can share their screens to present their work to the entire class and receive immediate feedback from teachers and peers with teacher permission. Through this feature, students can reinforce their learning objectives and increase their confidence.

The best solutions allow students and teachers to switch control easily (with teachers maintaining classroom management), facilitating a free-flowing efficient learning environment. The practice of sharing screens will encourage respect, negotiation and cooperation skills, which will lead to a collective learning experience.

The forms in which these uses apply to real-life situations are countless. With such tools, teachers can let their imaginations fly, creating class dynamics only possible when quality content is available to everyone in the room.

What's the Most Engaging Technology in the Classroom?

This report asks 760 teachers to describe what the classroom will look like in 20 years and there were some common themes: hybrid, virtual reality, self-paced, blended, interactive, online learning, technology. Interestingly, teachers told us that on a scale of it made a small impact (1) to it made a huge impact (5), teachers said COVID impacted their motivation at a score of 3.4, yet teachers see the future of education being in a similar vein to what COVID has accelerated.

In the near future, sophisticated technology will make it possible for curriculum and teaching methods to be fully customized to meet the needs of each student. Learning will have a high level of individualization using body language, facial expressions, and neurofeedback.

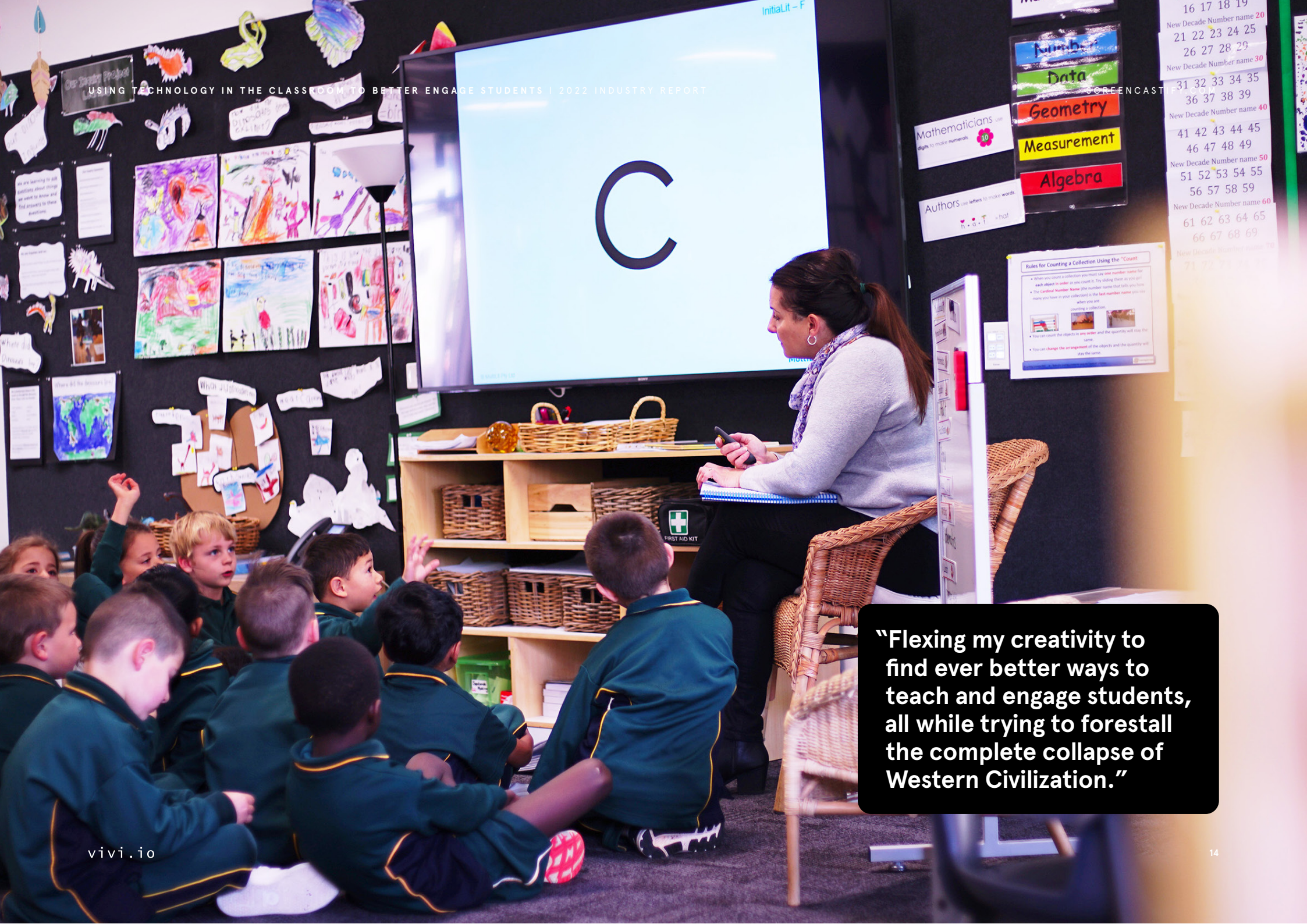
In the meantime, you can get your school ready for this transition with technologies to enable wireless classroom screen mirroring.

This is the kind of highly engaging technology for the classroom that is easy to manage and control while providing a modern learning environment.

Individuals are more likely to achieve their goals by participating and engaging more actively in a personalized learning environment. This kind of atmosphere requires a fluid, visual dialogue between teachers and students. Forward-thinking schools implement supporting technologies to lead the way.

Vivi's team is proud to provide educators with resources designed to help them reach students' potential.

We have experience integrating technology into the classroom to create more controlled, collaborative, and creative learning spaces. By leveraging wireless screen mirroring and digital signage, we empower educators to reach students' full potential and make education more engaging. All, with simple to use, intuitive, and affordable technology that will make your work as an IT administrator easier. Book a demo now.



"Flexing my creativity to find ever better ways to teach and engage students, all while trying to forestall the complete collapse of Western Civilization."

When it comes to today's schools, flexibility, technology and student engagement are hot topics. Much has already been written about the benefits of each and plenty of cases studies describe successful implementations and outcomes.

But what impact are these approaches and systems having at the frontline? At Vivi, we set out to find out. We wanted to understand what access teachers have to technology and how they use it in the classroom. We wanted to know more about the day-to-day challenges they face and to learn their hopes—and fears—for the future.

We developed a 34-question survey and sent it to teachers across the US and Australia. We asked them to respond to a mix of multiple-choice, interval-scale and open-ended questions designed to give us insight into classroom life.

In total, 760 teachers from a variety of education sectors responded. Almost half (48%) worked in public schools, just over a third (36%) taught in private or independent schools and virtually all the rest (16%) represented Catholic schools. We were able to capture the thoughts of teachers with a wide range of service. Nearly 1 in 5 (19%) had been teachers for less than 10 years and almost half (43%) had clocked up more than 20 years in the classroom.

What these teachers told us was rich, impassioned and insightful. Respondents spoke of the challenges they face each day and the techniques they use to overcome them—if, indeed, they have been able to. They also called out what they saw as very real problems that stand in the way of their efforts to engage and inspire students in the classroom.

We're very grateful to have received such a high level of responses and have done our best to represent both the comments—and the sentiments behind them—in our report.

School sector

According to Education Week, in the US there are almost 100,000 public K-12 schools (91,328 traditional public schools and 7,427 public charter schools). There are 32,461 private schools. Of the 5.7 million students who attend a private school, 37.4% of those are Catholic.

Public/government	48.7%
Private/independent	36.2%
Catholic	16.3%
Other	0.4%

Teacher tenure

Also accoring to Education Week, the average tenure of a teacher at any school in the US is 14 years. At least 44% of new teachers leave teaching within five years, which is down from over 50% about 20 years ago. Meanwhile, the average age of teachers has gone from mid-50s to mid-40s.

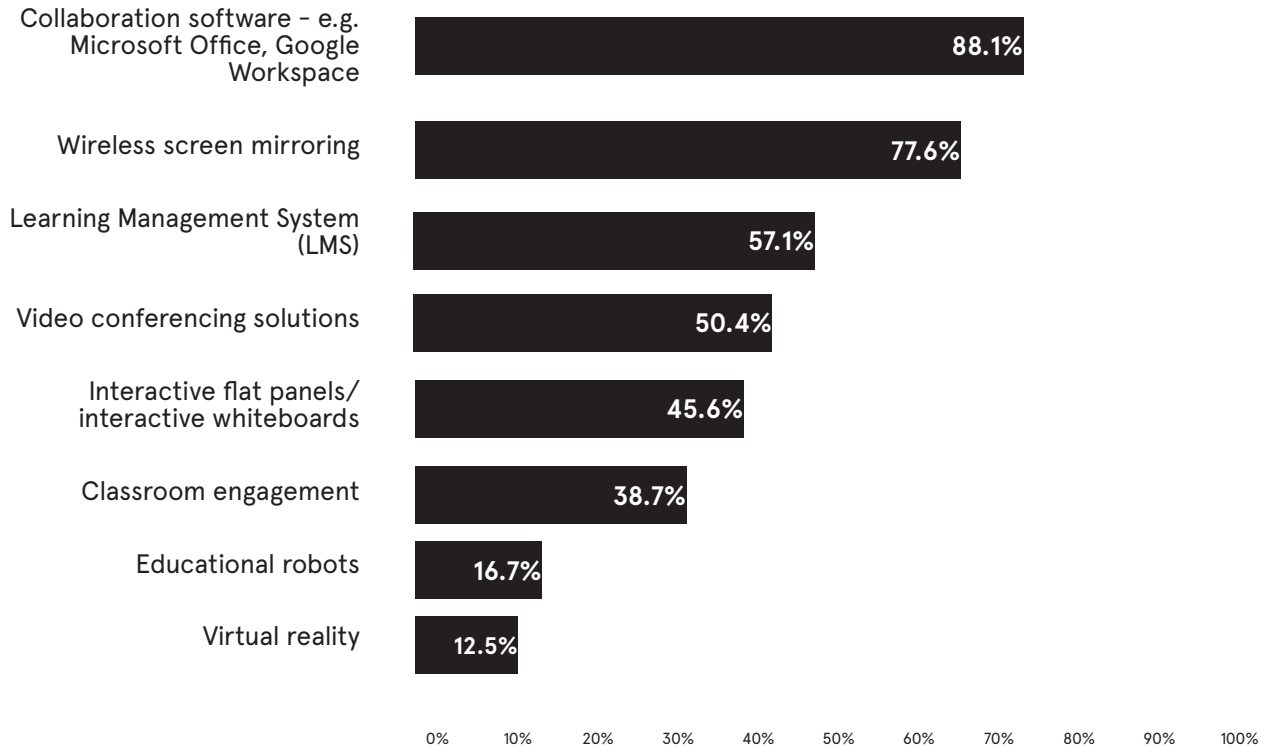
19
Years

Access to lesson building tools

A study titled `Investigating the pedagogies of screen-sharing in contemporary learning environments – a mixed methods analysis' explored current educational use of screen-sharing technologies by examining teachers' perceptions of learner engagement, benefits and limitations, and teacher pedagogies.

Findings revealed teachers' beliefs that the technologies improve learning and teaching through stronger engagement, improved teaching, deeper thinking, greater focus, and reduced distraction.

Teachers generally felt the technologies to be worth the investment of their time and would readily recommend them to colleagues.



Feelings towards students using devices in classrooms?

According to one McKinsey study, the type of device matters (some are associated with worse student outcomes), geography matters (technology is associated with higher student outcomes in the US than in other regions), who is using the technology matters (technology in the hands of teachers is associated with higher scores than in the hands of students), intensity matters (students who use technology intensely or not at all perform better than those with moderate use), and a school's performance level matters (in lower-performing school systems, technology is associated with worse results).

3.9 / 5

IT'S A DISTRACTION > IT'S GREAT!

Comfort level with Google/Microsoft products?

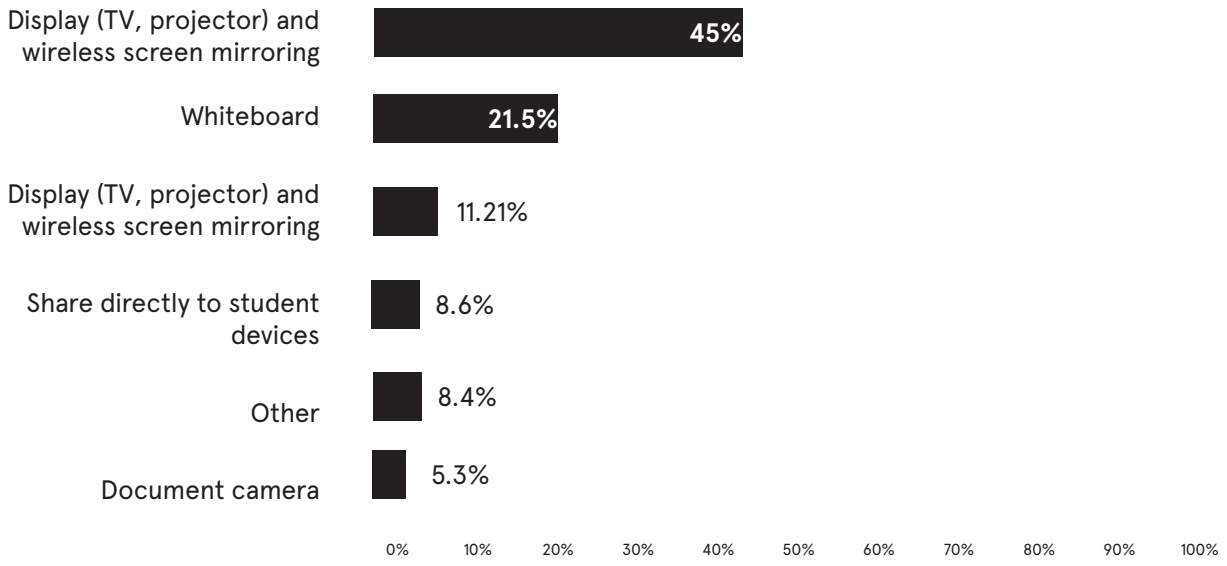
Chromebooks recognized massive market-share growth over the course of 2020 and 2021, most notably in the education sector, even overtaking macOS. This occurred for several reasons, but the pandemic was certainly a catalyst for great change given that it mandated people remain at home, which led to remote learning and working.

3.9 / 5

NO THANKS > I COULD TEACH A COURSE

Preferred method for explaining something visually

According to a research paper on screen-sharing, they summarized that screen-sharing technologies are becoming commonplace in many contemporary educational settings; the technologies represent integrated systems that enable functions such as mirroring, video streaming, online polls, real-time editing, screen capturing, and learner analytics; screen-sharing is indirectly examined in several studies with findings indicating improvements in group awareness, emotional engagement, learner confidence to share ideas, and teachers' visualisation of concepts; and existing findings are anecdotal with few studies focused directly on screen-sharing affordances.



Familiarity with screen mirroring

On a scale between "What is it?" (0) and "I can't teach without it" (5).

3.4 / 5

From "Investigating the pedagogies of screen-sharing in contemporary learning environments – a mixed methods analysis":

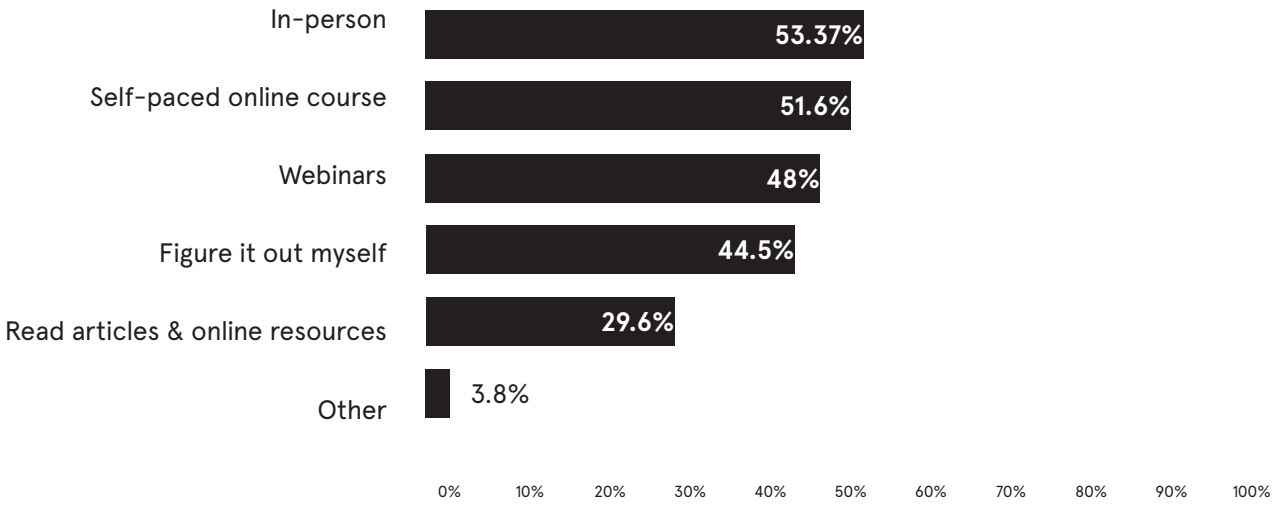
Contemporary educational institutions are embracing digital learning in ways that increasingly involve multiple screens in a single classroom, such as through bring-your-own-device (BYOD) programs and mobile learning. These technology-rich learning environments require learners to navigate shared physical and digital learning spaces while exercising a diverse range of enterprise skills such as transmedia navigation, distributed cognition, collective intelligence, critical thinking, and design thinking (Clinton et al., 2006; OECD, 2016, 2018). Screen-sharing technologies represent one response to these challenges by providing the technology infrastructure that allows teachers and students to view and interact with the same screen content on different devices in real-time. The ability to share a screen wirelessly with other devices in the same space has also evolved alongside related developments in Wi-Fi connectivity, real-time online documents, video streaming, web conferencing, remote desktops, virtualisation, and entertainment. These technologies can thus support engagement with digital content in a plethora of forms.

Educators are increasingly exploring screen-sharing to extend digital participation beyond traditional teacher-centred didactic instruction—typically in the form of "stand and deliver" teaching via conventional data projectors and digital whiteboards—and the relatively private domain of students' independent learning on personal or school devices. In classrooms where screens can be shared, some believe that barriers between devices and learners can quickly break down and digital learning and teaching have the potential to be highly visible, shareable, and innovative (see, for example, Raes et al., 2020). However, for many educators and school communities, the presence of digital technologies is often broadly accepted while not being leveraged and understood to its fullest extent (Sefton-Green, 2013; Smale & Regalado, 2017). Thus, although screen-sharing technologies are now well-established in many educational settings, understanding their impact on learning and teaching remains a challenge.

Given the relative paucity of research that directly considers the impact of these technologies on learning and teaching (established below), this study was designed to directly examine the benefits and issues associated with teachers' use of these technologies, as well as the sorts of pedagogies typically applied, in order to inform future practice and research. Specifically, the research team designed a teacher questionnaire relating to screen-sharing technologies, their impact on students and their uses with teachers, and conducted a principal components analysis (PCA) to determine key factors. The validated factors and items were then used as a lens for examining benefits, issues, and pedagogies of screen-sharing in combination with the qualitative data that was collected.

Preference for new tech product training

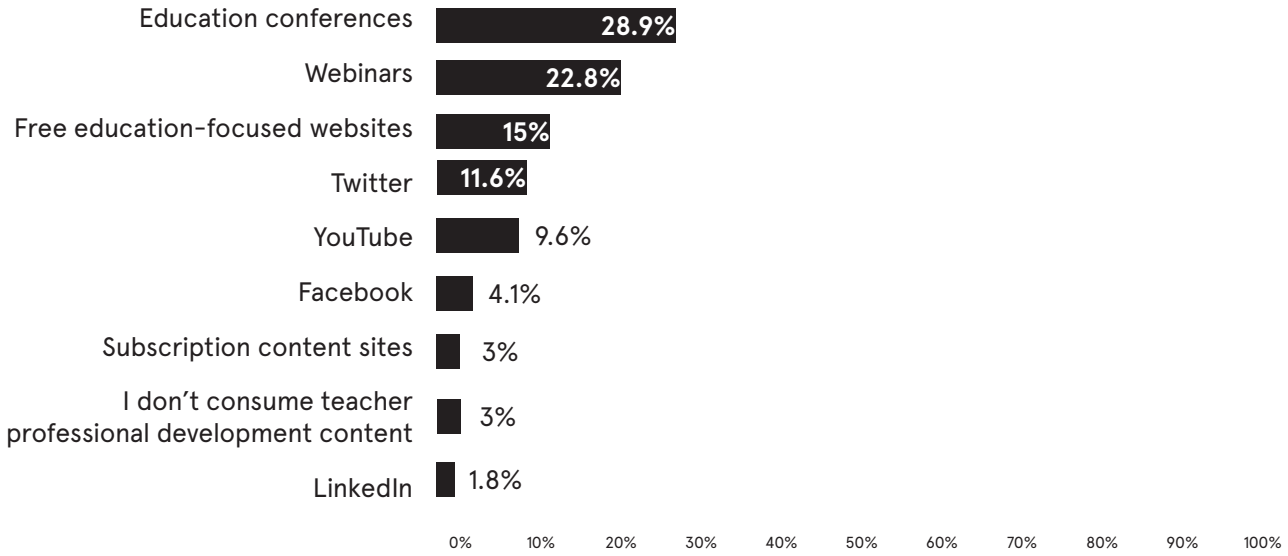
There are three pillars of research in the learning sciences, according to Forbes.
Construction: Learning happens when we build or make things. In addition to the physical or digital output of our work (and what we have to learn in order to complete them), we are also forced to construct new mental models.
Cognition: Learning happens when we think things. We make observations, we process feedback from our environment, we simulate and predict and then we update our predictions.
Community: Learning happens when we want to survive and thrive amongst a group of people that have a shared collection of practices.



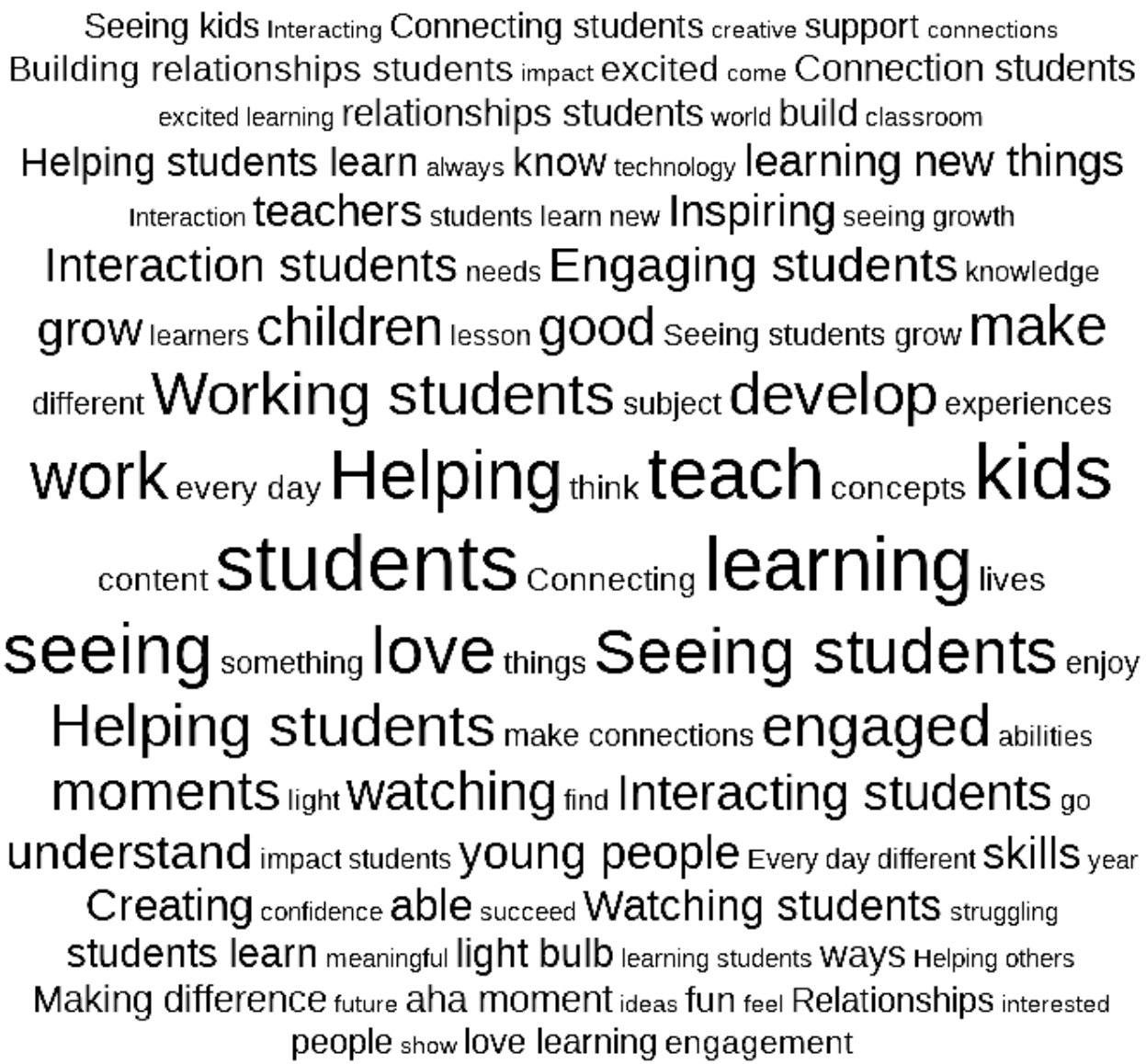
Consuming teacher professional development content

According to The Business Journals, professional development helps employees continue to not only be competent in their profession, but also excel in it. It should be an ongoing process that continues throughout an individual's career. Actively pursuing professional development ensures that knowledge and skills stay relevant and up to date. It also allows employees to be more aware of changing trends and directions in an industry.

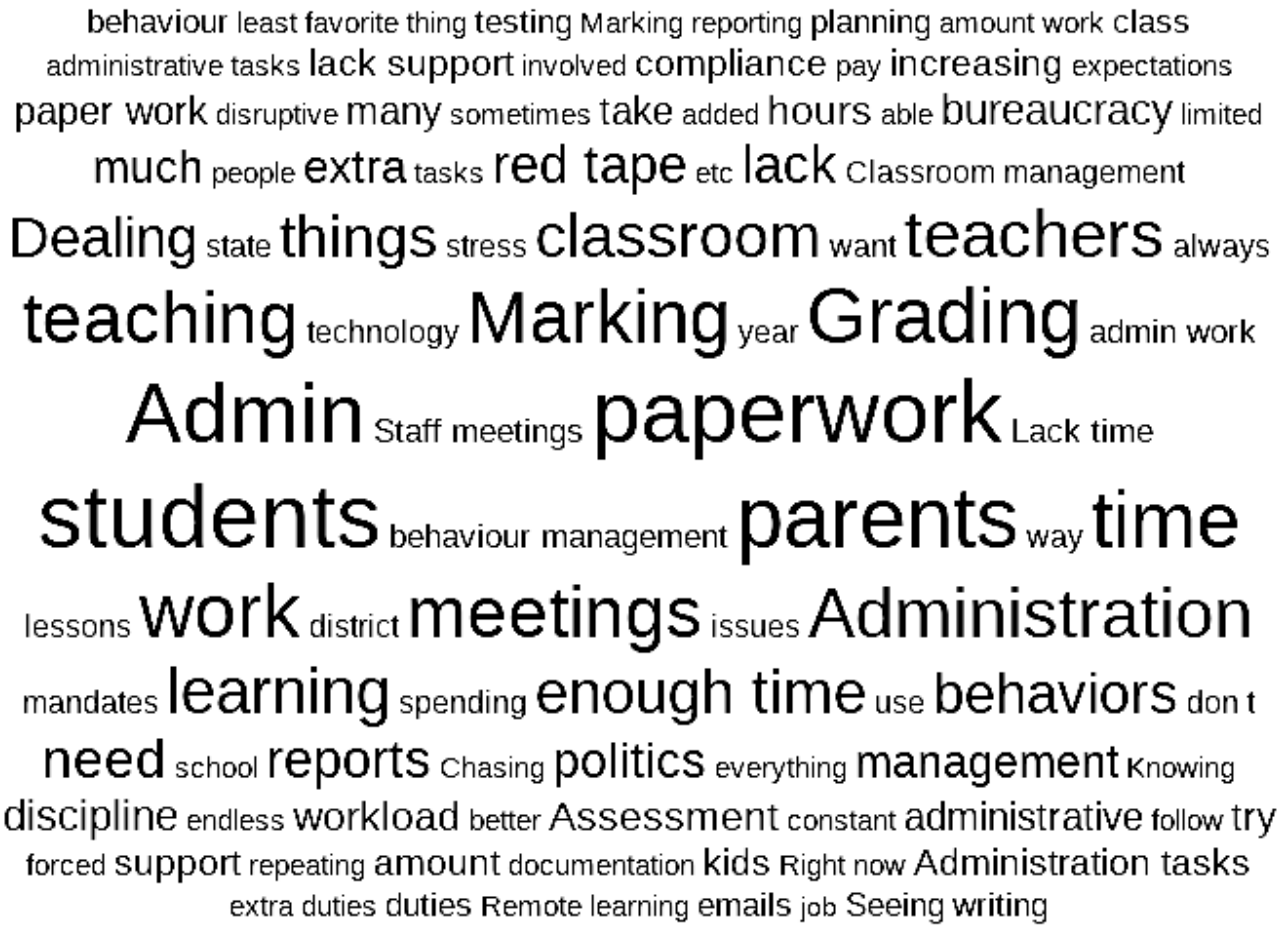
With the professional world moving at a faster pace than ever before, standing still will cause you to be left behind as peers expand their knowledge and skills.



Your favorite thing about being a teacher



Your least favorite thing about being a teacher



"The kids! Their enthusiasm for learning is contagious. I love it when a student who has struggled and hated school starts to enjoy being there and is willing to take risks to increase his/her learning."

The one thing in the classroom that always takes longer than it should

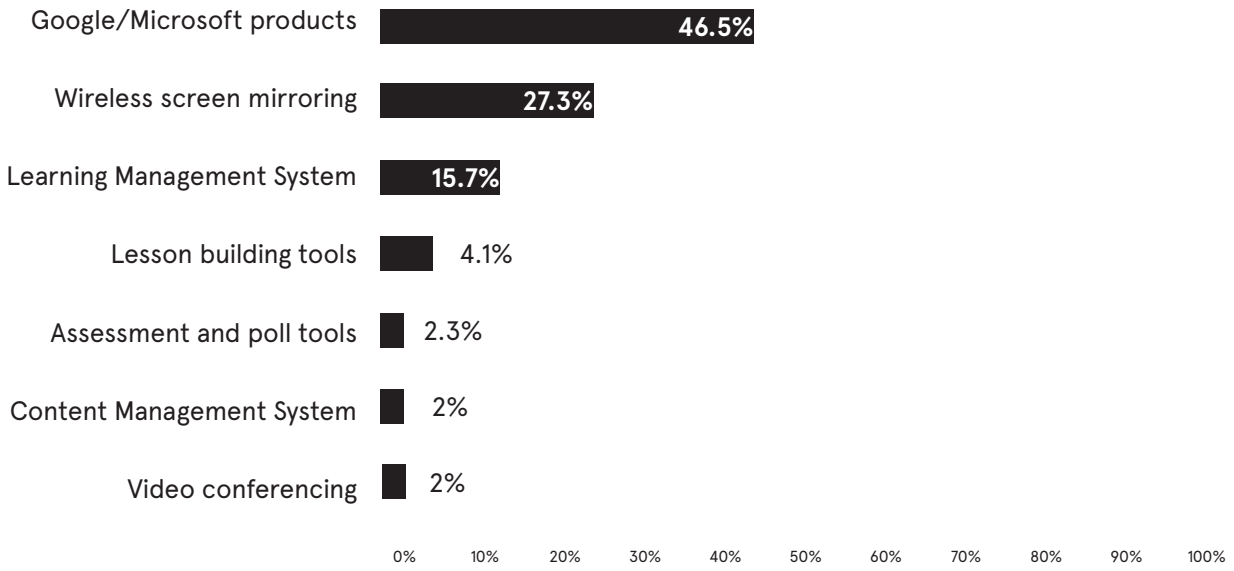
Examples of making learning fun

Software you couldn't live without in the classroom

According to eLearning Industry, the 11 most heavily used edtech solutions used in classrooms are: Edmodo, Socrative, Projeqt, Thinglink, TED-Ed, cK-12, ClassDojo, eduClipper, Storybird, Animoto, and Kahoot!

Screen-sharing technologies are becoming commonplace in many contemporary educational settings.

The technologies represent integrated systems that enable functions such as mirroring, video streaming, online polls, real-time editing, screen capturing, and learner analytics.



Using social media for work purposes

2 / 5

NEVER > MULTIPLE TIMES A DAY

Using social media for personal use

3.1 / 5

NEVER > MULTIPLE TIMES A DAY

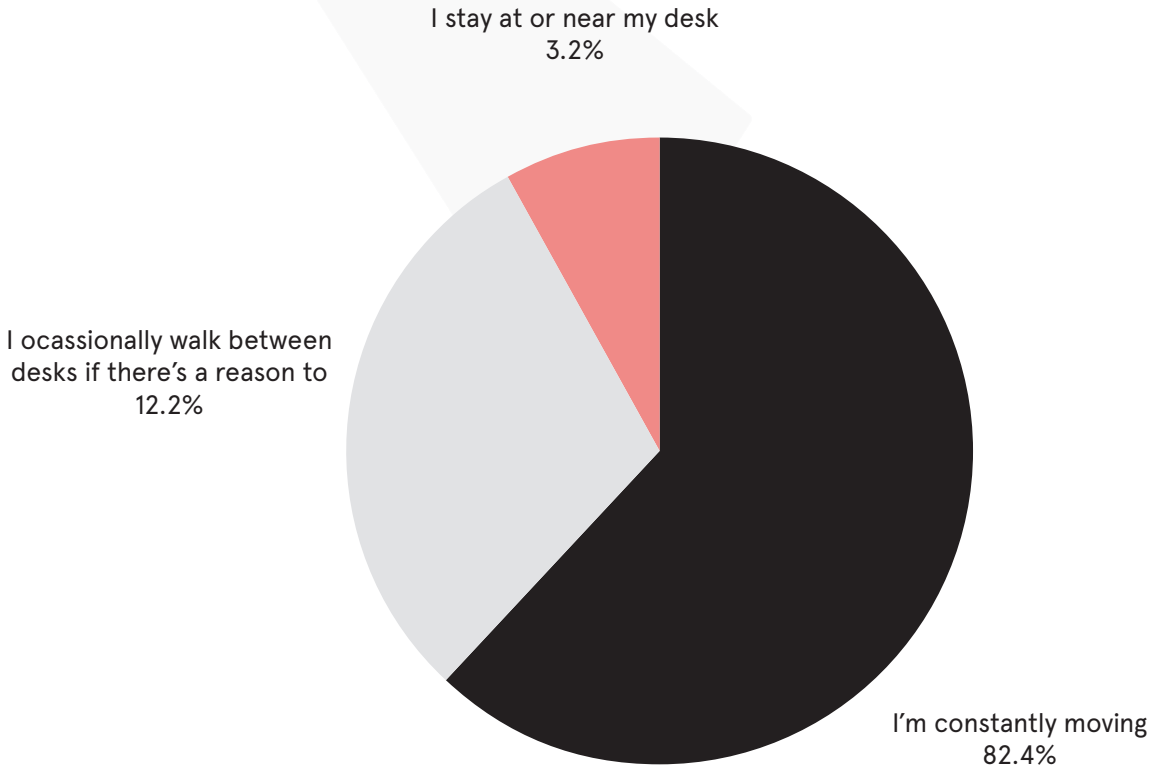
Using technologies that were designed for education

75.7% Yes

Moving during a typical class

Ron Cone, Director of Information Technology for Kennewick School District, recalls their initial implementation of Vivi. "Look, Vivi was just very quick and easy to adopt. We set it up in our first building and were starting to plan how we were going to start training our teachers when we discovered they were already using it. It's so easy to use, they just took off and ran with it.

"When we first started using Vivi, our teachers loved the mobility around the classroom and would walk up to students at their desks and use the whiteboard feature on the teacher's device to get students more involved. Now we're pretty much at 1:1 devices so students can just share their work from their desks.



The importance of community as a teacher

3.8 / 5

I DON'T REALLY ENGAGE WITH OTHER TEACHERS

>

I ACTIVELY PARTICIPATE IN TEACHER FORUMS

Relationship between teachers and the I.T. department?

3.4 / 5

WHAT DO I NEED I.T. FOR?

>

OUR I.T. ADMINISTRATOR WAS IN MY WEDDING

Using virtual reality in the classroom

77.4% No

The importance of playing videos during a class

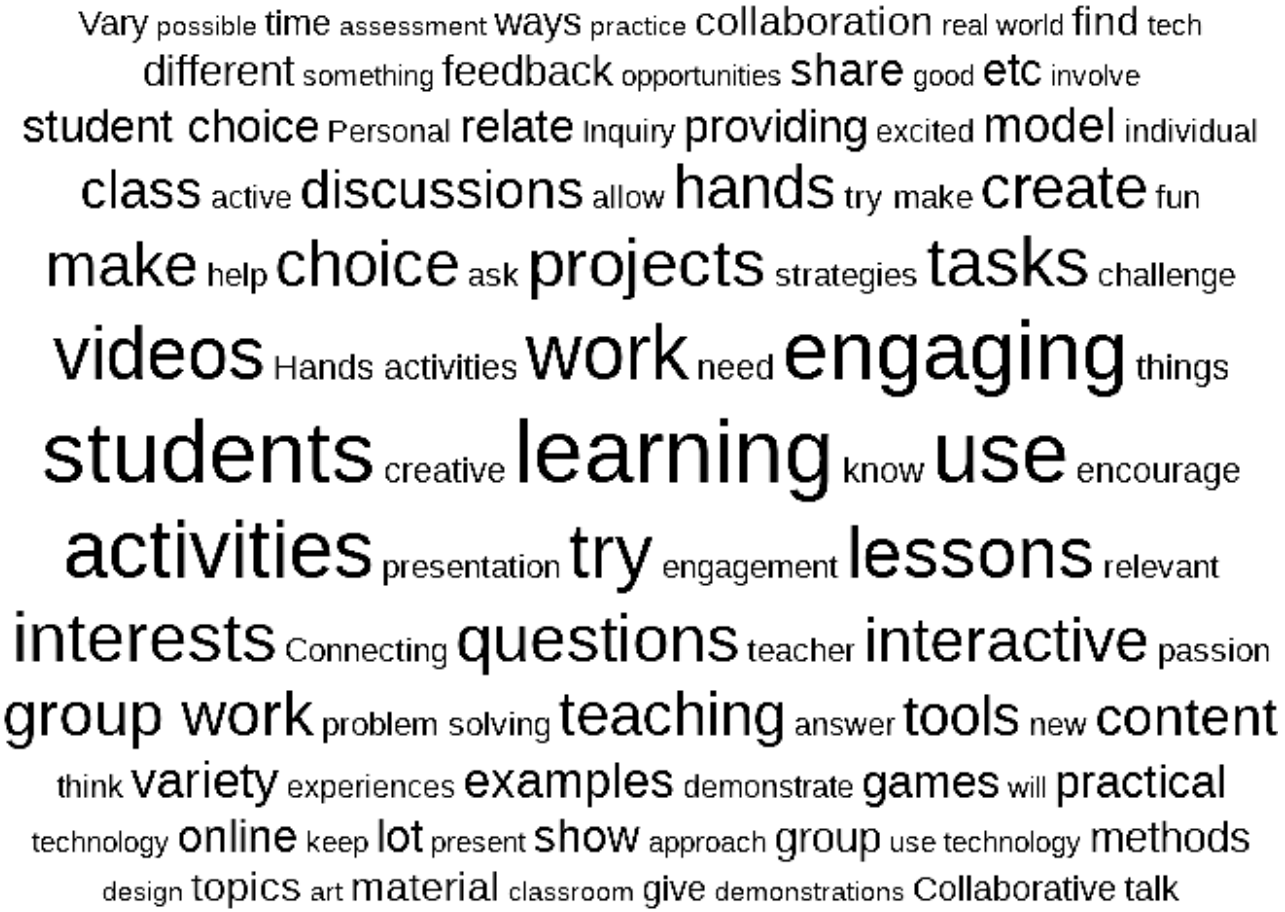
3.4 / 5

I NEVER PLAY VIDEOS

>

I REGULARLY PLAY AND CREATE VIDEOS

Methods to inspire students to be active in learning



While there were, literally, hundreds of ways in which teachers said they inspired their students, the concept of voice and choice seemed to resonate with many.

There was widespread mention of giving students choice in the classroom—both in selecting activities and in deciding the best medium through which to deliver their work. One teacher said their students were given the option to respond in "... whatever method they believe best showcases what they have learned."

In terms of voice, teachers were clear that active participation in classes was something they strived to achieve. "I want them to be active in their education and to be problem-solvers and thinkers, not just passive consumers," said another teacher.

Participation was mentioned by many in a number of guises—whether group work, class discussions or enquiry-based learning. They talked of giving students projects, problems or scenarios which require them to answer plenty of questions to find out the information they need.

Teachers even talked about using the movement of students around the classroom as a way to enhance interaction and participation and inspire engagement.

The importance teachers place on building relationships and developing trust was clear. They use their knowledge of each individual to try and personalise learning. Some said that sharing personal stories was a good way of relating content to the real world, demonstrating understanding and encouraging participation.

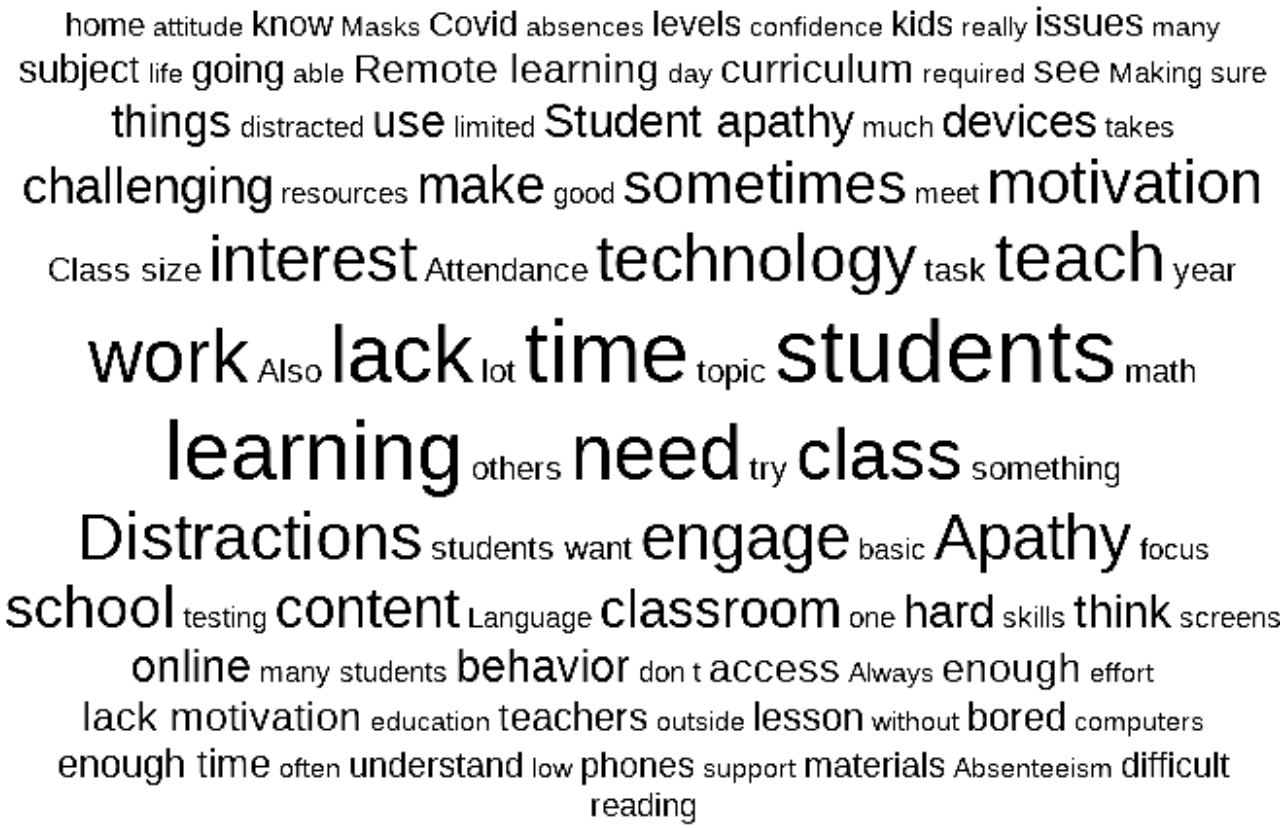
Many drew a link between inspiring students and making learning fun. Hands-on learning, participation and gamification were listed as popular go-to options and teachers gave plenty of examples of how they related these experiences to the real world. One teacher described it as "making connections between students' learning and their daily lives."

Besides injecting humour, songs, dance and movement into lessons, teachers were also very clear about the role technology played in inspiring students and making lessons fun. They listed plenty of programs and applications that they used on a regular basis to bring presentations to life, gamify learning, poll and test their students.

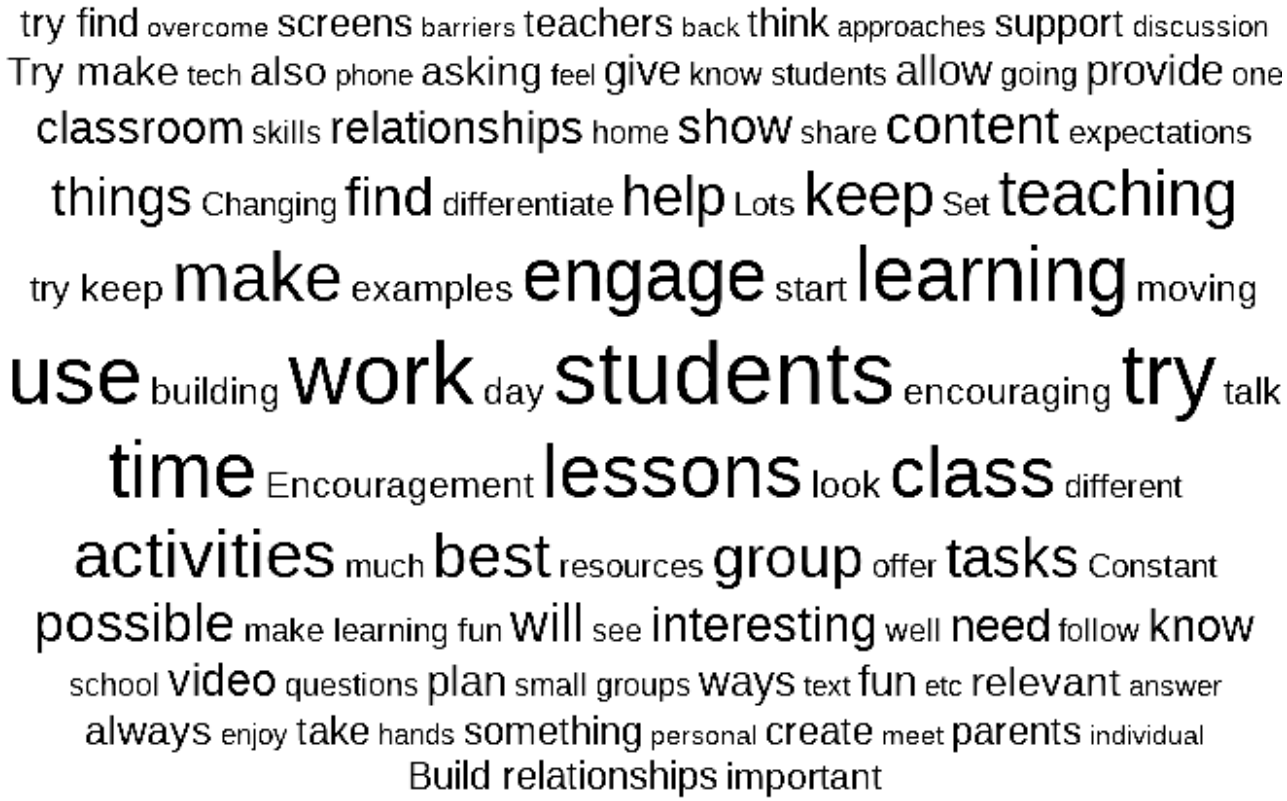
It's worth noting that not all teachers said they set out to specifically make learning fun. Some said their aim was to make learning relevant and interesting. Others said they wanted students to see them making mistakes so they knew it was okay to make them too.

"Watching the light bulb go off when a student gets it! Seeing the beauty of the child inside even if they are tough on the outside. Being part of the growth process of children."

The biggest barriers to engaging students



Overcoming those barriers



One of the biggest barriers to engagement, it seems, is the students themselves. Without interest, effort and a commitment to learning, the subject matter and delivery make little impact. Several teachers made references to the challenges of maintaining engagement during remote learning, while others said students' behaviour in the classroom has changed now they have returned to a face-to-face environment after such a prolonged period away. One teacher told us that students simply "don't know how to be in a classroom environment anymore." Another made the observation that while wearing masks in a classroom prevents the spread of disease, it can be very difficult to know which student is speaking.

Distractions were a common theme. Many said there were lots of them inside—and outside—the classroom. Some teachers said students spent too much time gaming or on their phones, which made maintaining any interest in schoolwork a challenge. "Unfortunately," said one teacher, "a cell phone is more interesting than I am."

Poor attendance was identified as a problem by some, and others said language and other socioeconomic factors sometimes presented a barrier to engagement. One said: "some of my students do not have phones and have no Wi-Fi at home and so it is a juggling act to try to provide them with the means they need to engage in class without affecting their self-esteem."

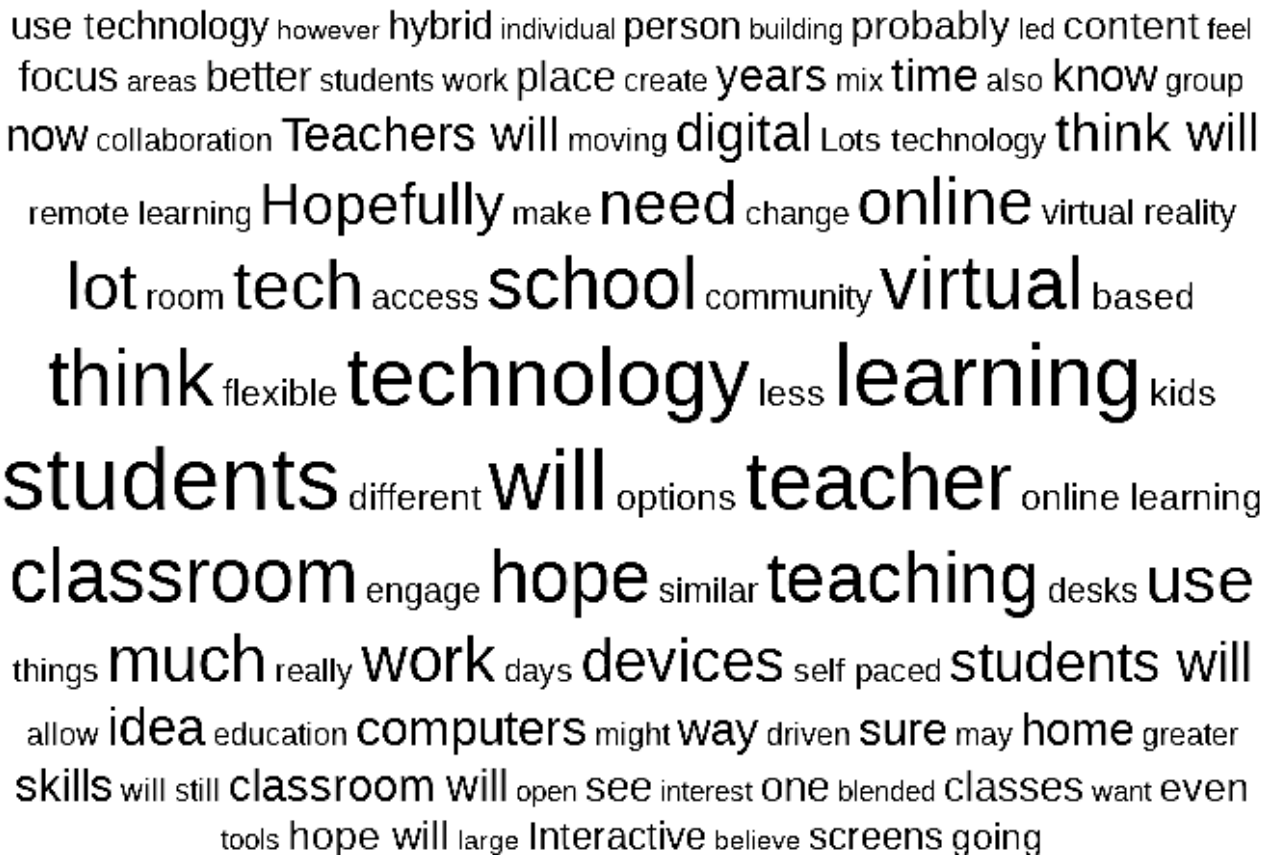
Some teachers referenced challenges with technology. Sometimes there were not enough devices to distribute them on a 1:1 ratio, and sometimes technology failed. Occasionally, students couldn't get to grips with the technology or, at the other extreme, were underwhelmed by it.

Teachers also made mention of the lack of time they had to spend with individuals. With students all operating at different levels, it was difficult to make content relevant and relatable to all members of the classroom.

These are all obstacles teachers find difficult to overcome. For many, the solution lies in relationships. Some take time to socialise with students before and after class—making sure to note down important details so they can reference them in future conversations. According to one, the solution "... isn't about academics. Students will learn what you teach if they like you."

Others experiment with different formats, trying to mix up lessons to maintain engagement. They spend a great deal of time searching for or developing interesting media and planning for things like group activities and rotation stations.

Describe what you think the classroom will look like in 20 years



Though not all see a rosy future, there's plenty of positivity among teachers about what the next twenty years will hold for education. By and large, most are convinced that technology will remain at the very heart of learning in the coming decades, though one teacher calls for "... a balance between technology and face-to-face teaching. Technology," they say, "should be used to enhance learning, not as a replacement for teaching."

For some, the future will see advanced technologies embedded in schools. They believe Artificial Intelligence will play a part in helping to coordinate the classroom and they see tools like Virtual Reality playing a key role in inspiring and engaging students. For others, technology's role will be that of enabler. As student-led learning becomes more popular, so technology will need to support students as they explore and learn on their own or elect to take lessons at times that suit them best.

Teachers also see a continuation of the trend towards flexible learning spaces. Indeed, some question whether classrooms will exist in their current format as students embrace hybrid learning and, perhaps, choose to adopt a purely virtual model. They see the future classroom as a kind of meeting point, rather than the centre of a student's education.

Once again, enabling this kind of asynchronous approach to learning and supporting student choice will need to be underpinned by technology—both in terms of delivery and ensuring that all students have access to the tools they need.

It's worth noting that some teachers also fear for the future. They worry about the apathy they see among some of today's students and are unsure how the trend can be reversed. They feel students will continue to be exposed to more and more external calls on their time—through sport and access to an even wider range of social media sites—which will reduce the amount of time spent learning and provide even more distractions to a future generation.

Excitment about going to work each day

3.7 / 5

IT'S A STRUGGLE > I LOVE BEING IN THE CLASSROOM

How COVID has impacted excitement for teaching

3.4 / 5

NO IMPACT > IT'S BEEN VERY HARD

Nearly half of the teachers in a survey by the Independent Education Union South Australia conducted during the height of the coronavirus (COVID-19) pandemic reported working almost an entire extra day while teaching from home, with some working in excess of 20 hours extra per week.

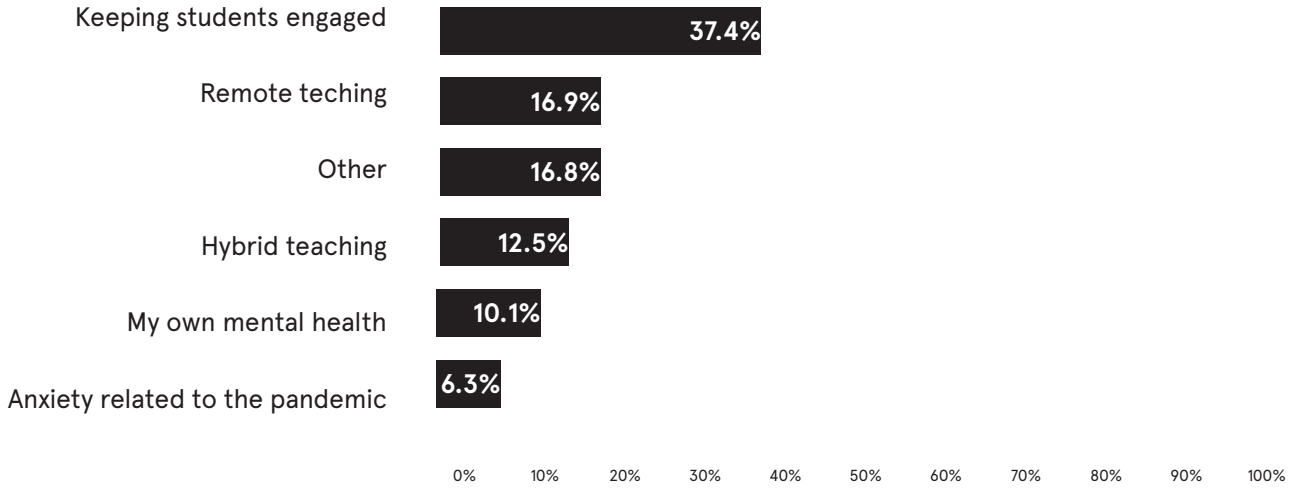
This was on top of teachers reporting significant mental health and wellbeing problems during this period. The Australian Education Survey, examining the impact of COVID-19, was led by Dr Natasha Ziebell from the Melbourne Graduate School of Education and received more than 1200 responses from teachers who work across the education sectors.

It found 66 per cent of all teachers reported working more hours than usual during every week of lockdown.

The most challenging part of teaching through a pandemic

The impact of the COVID-19 pandemic on education will have far reaching consequences. A better understanding of the experiences of educators and students across the globe is essential in informing what supports and adjustments are needed now and into the future, according to a survey by the Independent Education Union South Australia.

"The pressure on us right now is enormous," said one teacher. "It is difficult to manage healthy breaks away from work because parents and children and our leaders all require so much from us right now."



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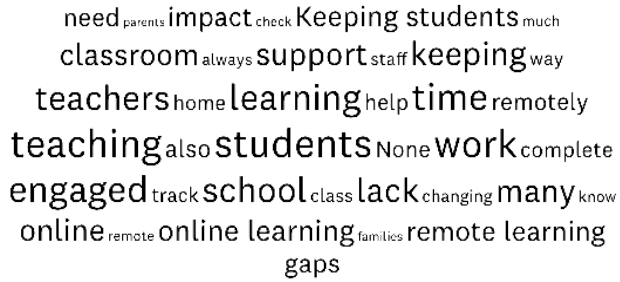
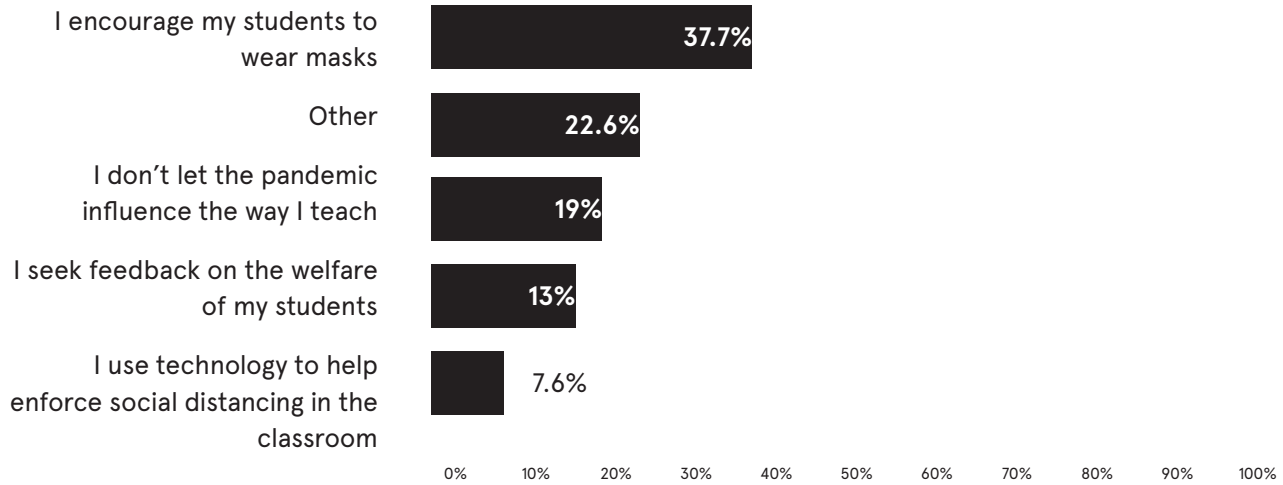


Tools and strategies to mitigate the spread of Coronavirus

In one study titled 'Mitigating COVID-19 outbreaks in workplaces and schools by hybrid telecommuting', simulation was used to analyze the risk of outbreak and the impact of contact-limiting strategies. The strategies investigated involve (1) Rotation, in which workers are evenly split into two shifts that alternate on a daily or weekly basis; and (2) On-Off, where the whole group alternates periods of normal work interactions with complete telecommuting. The study yields clear results, from best to worst: Rotating week-by-week, Rotating day-by-day, On-Off week-by-week, and On-Off day-by-day can all help mitigate transmission below a certain epidemicity threshold.



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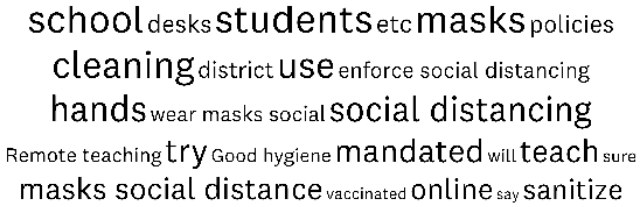
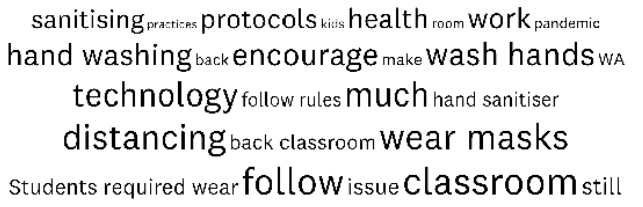


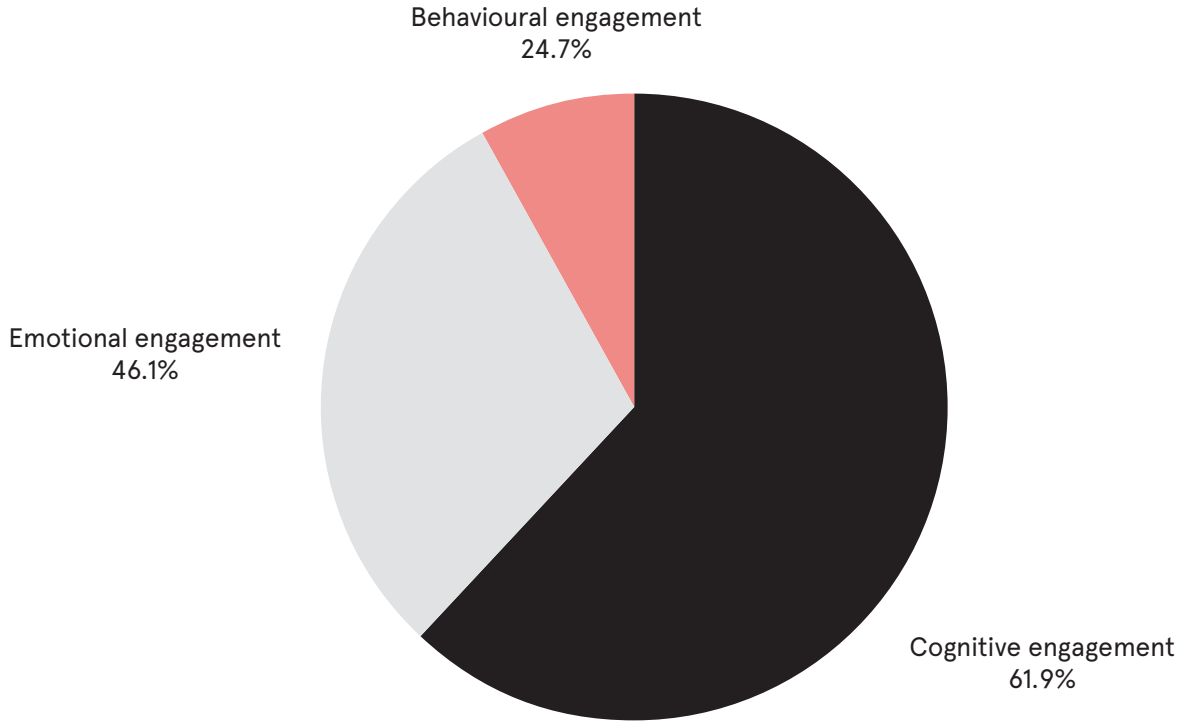


"If I had to point out one thing, it would be those very infrequent moments when the students are really responding to the content of the lesson, and they begin talking about the material amongst themselves, and making connections to larger concepts and experiences."

Forms of student engagement being focused on

There are three types of student engagement.

Behavioral Engagement is when students actively participate in the learning process. They show up on time, turn in their homework and bring the materials they need for class. They participate in discussions, listen to the teacher and try their best.
Cognitive Engagement is when students try to learn as much as they can. They pay attention, ask thought provoking questions, and go beyond what you ask them to do.
Emotional Engagement is when students have a positive outlook on their education. They treat you and their classmates with respect and approach schoolwork with optimism.

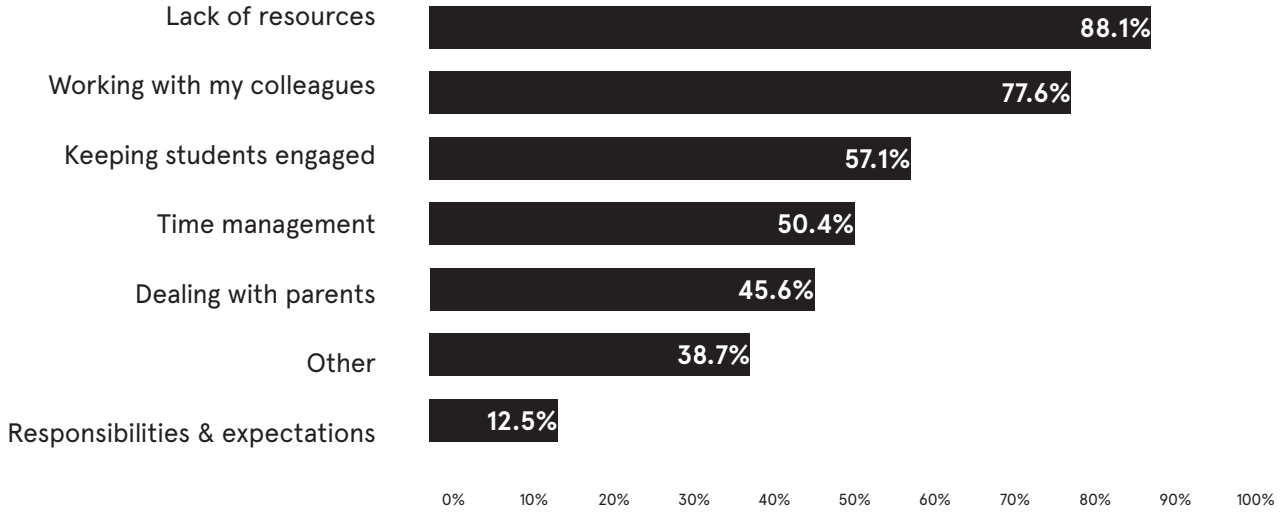


The hardest part of your job

Teachers are exhausted. One even said as such: "Right now I would say exhaustion".

Not enough time, others not following through on their part, dealing with the fallout of students "losing it", work-life balance, student accountability, not enough time, and even "knowing the way I'm asked to do something isn't always the best for the kids but I have to comply because of the status quo'.

A teachers' job is incredibly hard - the responsibilities are high, the rewards don't always match, and the day-to-day recognition isn't always there. This has all compounded during a world-changing pandemic that has placed increase pressure on teachers.



Other: management really lack enough time hard Multiple teach find time kids students within working every Keeping given school enough Nothing

Though their comments indicated an element of concern, more than two-thirds of teachers (70%) were excited about their role. Interestingly, tenure was a factor in their degree of excitement about the day ahead; almost 40% of those with more than 20 years' service remained excited about their role, whereas only 30% of those with fewer years of service concurred.

Responsibilities and expectations (29%) were seen as the hardest part of the job and we gained some insight into this through comments made in other sections. Some teachers said the rigidity of the curriculum made engaging students in their learning difficult. Others talked about the focus on tests and administration that occasionally seemed more important than the imparting of knowledge itself.

Keeping students engaged was seen as a challenge by 1 in 5 teachers (21%). From their comments about engagement, it is clear that many see the rise of technology as a double-edged sword.

There's no question it has enabled teachers to embrace creativity in the way they deliver messages and also sets the foundation for flexible and student-led learning. But the use of technology has also become a distraction for students—both inside and outside the classroom. Teachers talked of students being too tired to learn and of them using their devices inappropriately.

Teachers also made a number of references to student apathy and an intrinsic lack of desire for learning. For some, no matter how hard they try to engage their students, their efforts fall on deaf ears.

Time management was the third most common challenge (18%). In their comments, some teachers indicate that much of their planning and content creation has to take place outside their core work hours and, in some cases, while on vacation. Some of the comments from teachers also reflect their sadness that they no longer have time to engage with their students 1:1—something many consider key to maintaining engagement.

Technology has also impacted the amount of time teachers have available. While devices and applications have no doubt delivered productivity improvements for many, some say they can be difficult to access or take much longer to load media than they should do.

Teacher-student collaboration in the classroom: What the research tells us

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Personalized Learning: What is it, and how do you embed it into the classroom?

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Using technology in the classroom to better engage students

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