

logitech

The Ergonomics Equation

Creating a More Comfortable Classroom



Executive Summary

Addressing the Vital Connection Between Physical Comfort and Student Engagement in Today's Technology-Enhanced Schools

With 1 in 4 teachers reporting that their students experience head, neck, wrist, and/or hand pain or fatigue while using educational technology, ergonomic issues are a sizeable concern in K-12 schools, suggests a new survey of more than 1,000 U.S.-based K-12 teachers, principals, and district leaders. Logitech commissioned the nonprofit, nonpartisan EdWeek Research Center to conduct the survey in the summer of 2022.

Key findings include:

- **The Ergonomics-Engagement Connection:** The challenges highlighted by the results have the potential to impact not only students' bodies but their minds: **74% of teachers and administrators say levels of physical comfort while using edtech impact student engagement.** Teachers who believe that hardware accessories (such as headsets, styluses, mice, keyboards, webcams, and document cameras) have a positive impact on student engagement are also more likely to say that their students are physically comfortable while using these tools.

- Limited Awareness:** Although digital wellness challenges are relatively widespread, administrators are not necessarily aware of their existence. **Just 5% of school and district leaders who influence edtech purchasing say that ergonomics have a major impact on the hardware accessories they buy despite the importance of student comfort.** And, though less than half of teachers report that they make a sufficient or excellent effort to help students use edtech in ways that do not lead to pain or fatigue, more than half of administrators believe that teachers in their districts and schools are making that level of effort when it comes to edtech ergonomics instruction.



- Teacher Training:** Teachers who report that they have received sufficient training on healthy positioning and posture while using edtech are 3.5x as likely as those who have not to say that they make an adequate effort to help their students avoid muscle pain or fatigue when using technology. However, most teachers say they have not received any professional development at all on edtech ergonomics.
- Underused Solutions:** Survey results suggest educators may be underusing hardware accessories to enhance the physical aspects of learning environments. **For example, three-quarters of teachers say their jobs make their voices hoarse or strained. But less than a quarter report that they use headsets with microphones daily.** These tools can help reduce voice strain by amplifying speech, making it easier for students to hear, and reducing the need for teachers to speak loudly.

The report concludes with recommendations.

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As classroom technology has become ubiquitous, the conversation surrounding edtech has shifted from ensuring that schools have enough of it to focusing on using existing tools in an effective manner.

One aspect of effectiveness that has flown beneath the radar is physical comfort.

As students spend increasing amounts of time using educational technology, comfort poses a potential and growing concern. For example, a recent [study](#) of 10 to 18-year-old Indian children during the pandemic found that 21% of the students suffered upper back pain, 18% reported lower back pain, and 13% experienced eye strain as their technology use increased during the remote learning. An earlier [study](#) of American middle school students found a significant association between musculoskeletal discomfort and the amount of time spent using computers.

If their backs ache or their eyes are strained, children can have trouble maintaining the focus and stamina required to remain engaged in learning throughout the school day. The right technology and instruction can eliminate or reduce these tech-related ergonomic challenges.

Students and teachers need to see and be seen, hear and be heard and have the ability to interact and collaborate with others for engaged learning to take place. These capabilities can either be enhanced or constricted based on the proper use of technology that is focused on increasing physical comfort during learning. For example, microphones can make teachers’ voices easier to hear, and document cameras can make content easier to see.

Yet relatively little is known about problems, perceptions, or solutions related to edtech, ergonomics, and the K-12 learning environment.

In the summer of 2022, Logitech set out to address this knowledge gap by commissioning the independent nonprofit, nonpartisan EdWeek Research Center to survey teachers, principals, and district leaders about perceptions and experiences related to edtech and ergonomics. Of particular interest were “hardware accessories” such as headsets, styluses, mice, projectors, displays, document cameras, and other tools with the potential to improve the functionality and ergonomics of devices while also addressing challenges related to students’ ability to see and hear what is happening in the classroom. For Logitech, a key objective of the survey was to gather information that might help maximize the impact of edtech on enhancing the classroom learning environment.

RESEARCH APPROACH

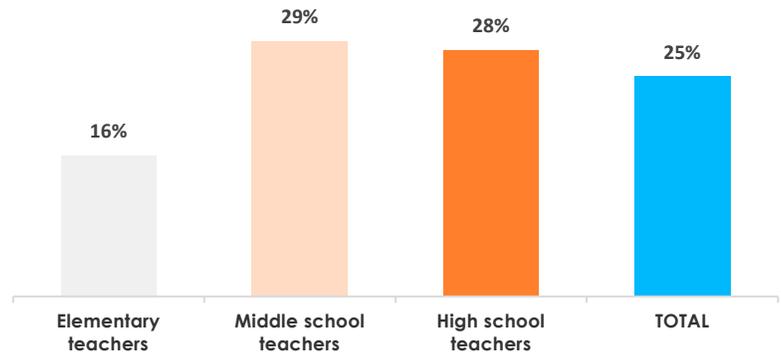
| | |
|-------------|---|
| WHO | 1,009 US-based educators including 180 school district leaders, 207 principals/vice principals, and 622 teachers. All principals and district leaders indicated they influenced purchasing decisions related to hardware accessories. |
| WHAT | A nationally representative, 41-question survey focusing on hardware accessories. For the purpose of the survey, these were defined as headsets, styluses, mice, projectors, displays, and document cameras that can add ergonomic advantages to technology but that aren't actually part of the devices (e.g., Chromebooks, tablets, laptops). |
| WHEN | August 18, 2022 - September 9, 2022 |
| WHY | The survey was conducted to gain insights into experiences and perceptions related to edtech and the learning environment in K-12 schools. |
| HOW | The survey was commissioned by Logitech and administered by the EdWeek Research Center. |

The Challenge

A quarter of teachers who participated in the Logitech-EdWeek Research Center survey say their students experience neck, back, and/or wrist pain or fatigue while using edtech. These ergonomic challenges are more frequently reported as students get older: While just 16% of elementary school teachers say their students experience neck, back, and/or wrist pain or fatigue while using edtech, that share nearly doubles to 28% by the time students reach secondary school. (Figure 1)

Figure 1

Percent of teachers who say their students experience neck, back, and/or wrist pain/fatigue while using edtech

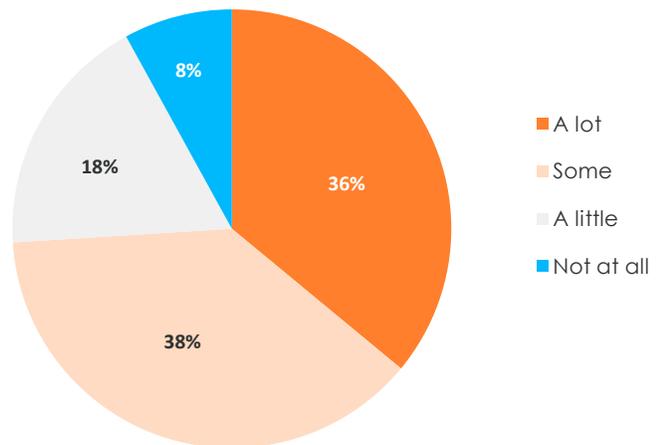


The Ergonomics-Engagement Connection

Ergonomically sound edtech use is not just a physical imperative. Survey results suggest that it is also a learning issue: Nearly three-quarters of teachers and administrators say that students' level of physical comfort while using educational technology has at least some effect on their level of engagement in learning. The connection between student engagement and student achievement is [well-established](#), suggesting that students who are more engaged in learning experience better academic outcomes. (Figure 2)

Figure 2

In your experience, how much does students' level of physical comfort while using educational technology impact their level of engagement in learning?



Hardware accessories are one key way of establishing that baseline of physical comfort that educators associate with student engagement while using technology. For example, for many students, keyboards can help make typing more comfortable and accurate. And styluses can be easier on students' hands than using fingers or point- and-click applications to draw or write math equations on a screen.

The connection between student engagement and physical comfort while using edtech may help explain why 85% of educators say that their hardware accessories have a positive impact on student engagement. (Figure 3)

In responses to open-ended survey questions, educators offered examples of how they use hardware accessories to help keep students engaged.

“I have taken the students on literature field trips via Google Earth,” wrote an elementary school teacher in Ohio. **“They use accessories (headphones, mice) to then view and create their own trips.”**

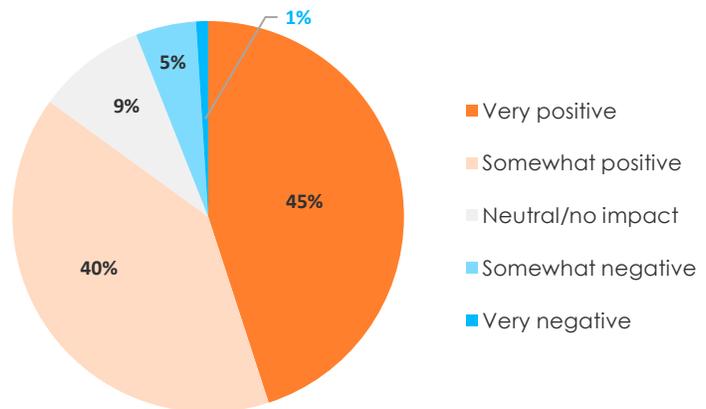
“I use a document camera and the projector daily in my classroom,” a North Carolina elementary school teacher wrote. **“I find the clear and large visual these accessories provide increase student engagement. It assists in keeping students on task and participating during lessons or activities.”**

A middle school Career-Technical Education teacher in Florida stated: **“I use my teacher microphone daily. All classrooms in my district are equipped with on[e]. It is a definite game changer in impact on both instruction and behavior. I also could not be nearly as effective without my [white board] projector. When the bulb goes out and I have to use only the whiteboard until it is replaced, student engagement drops significantly.”**

Survey results suggest there may be a correlation between educators' perceptions of physical comfort and student engagement: Compared to their peers who believe that hardware accessories have a negative impact on student engagement, educators who say these tools impact student engagement in a positive manner are more likely to say their students are physically comfortable while using these tools.

Figure 3

How would you describe the impact of the hardware accessories currently used in your classroom, district, or school on student engagement?



A middle school Career-Technical Education teacher in Florida stated: “I use my teacher microphone daily. All classrooms in my district are equipped with on[e]. It is a definite game changer in impact on both instruction and behavior.”

Teaching Students About the Ergonomic Equation

Survey results suggest that physical challenges while using edtech are relatively common and that they also have the potential to impact student engagement. Yet educators are not necessarily aware of edtech ergonomics: Asked which factors had a major impact on their most recent purchase of hardware accessories for their districts or schools, just 5% of administrators who influence edtech purchasing cited ergonomic concerns/ability to use items without pain or fatigue.

“I had not really thought about the manner in which hardware might affect students and writing,” a New Jersey elementary school principal wrote in response to an open-ended question. **“I will probably pay more attention to this now.”**

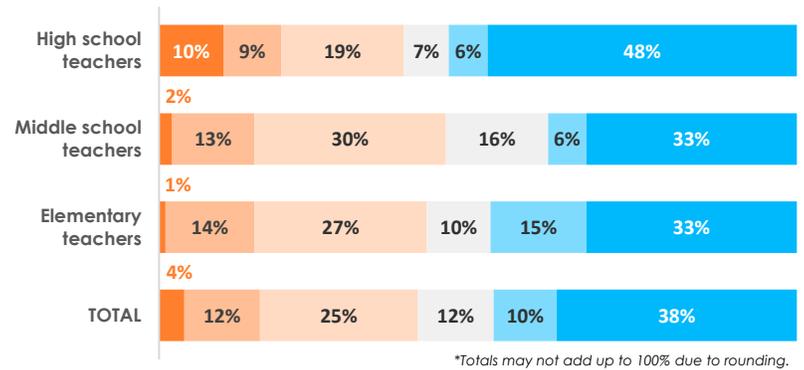
Because ergonomics is not top-of-mind, educators are not necessarily teaching students to use technology in ergonomically sound ways.

Thirty-eight percent of teachers say they do not devote any time to teaching students to use hardware accessories in such a way that the usage does not lead to muscular pain or fatigue. Although high school teachers are more likely to report that their students experience neck, back, and/or wrist pain/fatigue while using edtech, 52% say they make an effort to help students use hardware accessories without muscle fatigue or pain as compared to 67% at the elementary level. (Figure 4)

Administrators may be unaware that teachers are not addressing edtech ergonomics with their students. About 80% of school and district leaders believe their teachers are helping students use edtech in ways that don't lead to muscle strain or fatigue. Sixty-two percent of teachers say they are actually doing so. (Figure 5)

Figure 4

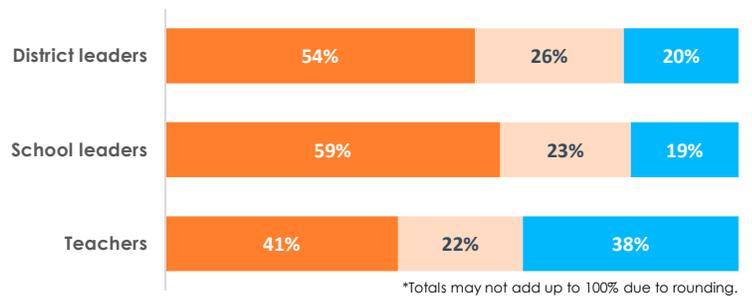
How would you describe the effort you have devoted to teaching students to use hardware accessories in such a way that the usage does not lead to muscular pain or fatigue?*



Legend: Excellent (dark orange), Very sufficient (light orange), Somewhat sufficient (medium orange), Somewhat insufficient (light grey), Very insufficient (medium blue), We don't do this at all (dark blue)

Figure 5

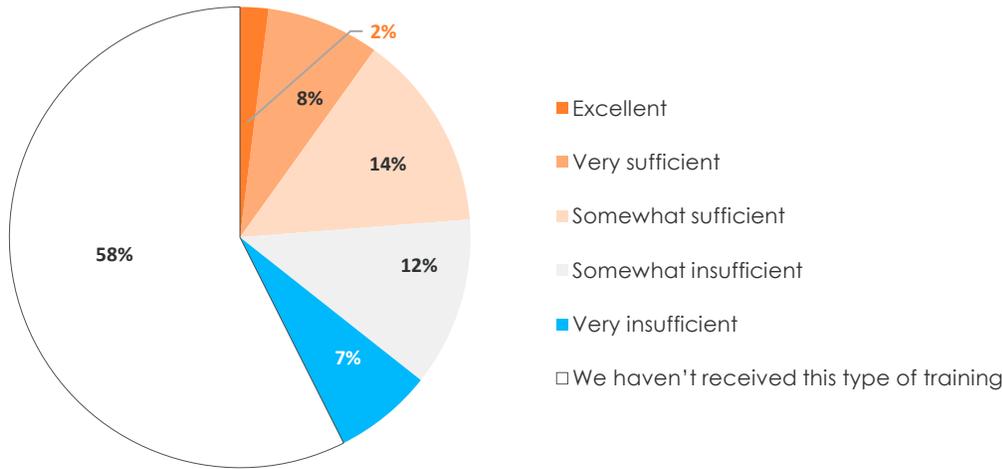
How would you describe the effort you—or the teachers in your district or school—have devoted to teaching students to use hardware accessories in such a way that the usage does not lead to muscular pain or fatigue?*



Legend: Somewhat or very sufficient or excellent (dark orange), Very or somewhat insufficient (medium orange), We don't do this at all (dark blue)

Figure 6

How teachers describe the training they have received on using and helping students to use hardware accessories in such a way that the usage does not lead to muscular pain or fatigue*



*Totals may not add up to 100% due to rounding.

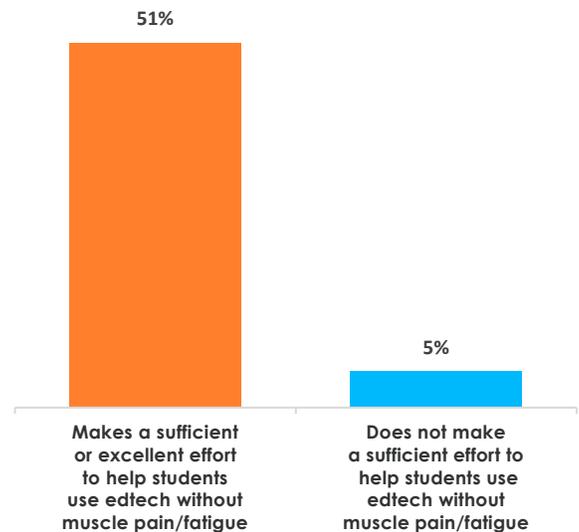
If teachers are not addressing ergonomic issues with their students, it may be because they themselves have not been taught how to approach this subject. Most teachers surveyed (58%) say they have never received training on using and helping students to use hardware accessories in such a way that the usage does not lead to muscular pain or fatigue. Just 2% say they have received this type of training and that it was excellent. (Figure 6)

“We as a district have not had formal training on how to best teach students or ourselves how to use equipment with our technology to prevent muscle pain or fatigue,” a district-level technology leader in Missouri wrote in response to an open-ended survey question. **“I think this would be valuable to our students and staff.”**

When teachers do receive adequate training on helping students use edtech in an ergonomically sound manner, they are more likely to say they try to teach students to use hardware accessories in such a way that they avoid causing muscular pain or fatigue. Teachers who describe themselves as making a sufficient or excellent effort to help students use hardware accessories without pain or fatigue are more than ten times as likely to say they received sufficient or excellent training in this area than teachers who say their efforts to help students use these tools in an ergonomically sound manner are insufficient. (Figure 7)

Figure 7

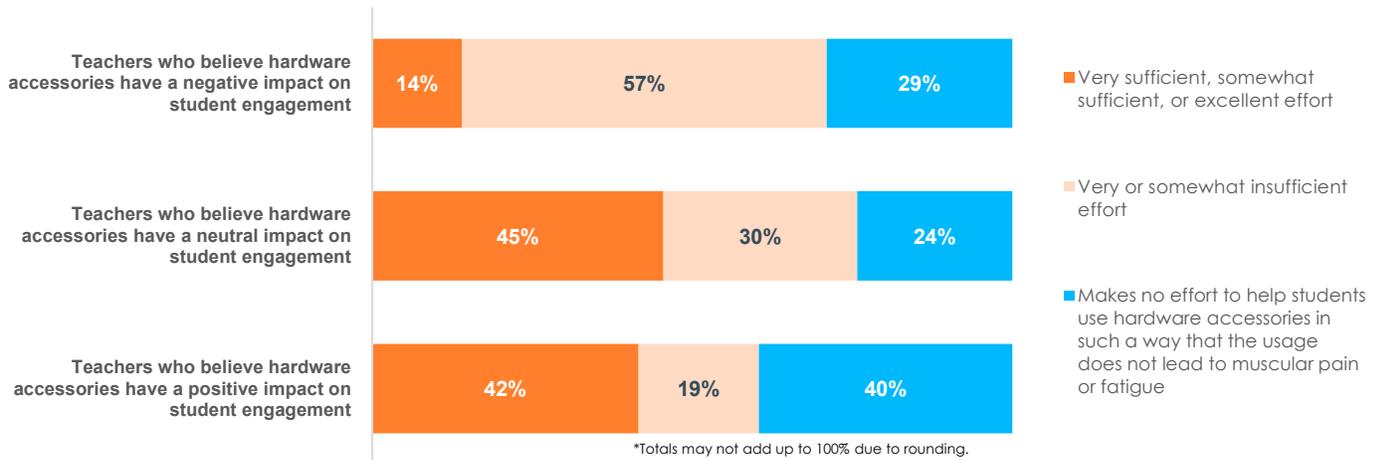
Percentage of teachers who received sufficient or excellent training to help students use edtech without muscle pain/fatigue



Teachers may be able to improve levels of engagement during edtech use by helping students learn to use hardware accessories in ways that don't lead to muscle strain or fatigue: More than 40% of teachers who say hardware accessories have a positive or neutral impact on student engagement say they make a sufficient or excellent effort to help students use hardware accessories in ergonomically sound ways. Fourteen percent of those who perceive that hardware accessories negatively impact student engagement say the same. (Figure 8)

Figure 8

Level of effort teachers put into helping students use hardware accessories in an ergonomically sound manner by perceptions of impact of hardware accessories on student engagement*



| The Other Ergonomics Equation

Enhancing the Physical Comfort of the Learning Environment

In addition to their ability to increase levels of physical comfort during edtech use, hardware accessories also have the potential to address comfort-related challenges in the learning environment that predate edtech use.

Here's one example: Three-quarters of teachers surveyed say their voices are often hoarse and strained due to the quantity and volume of speech their job requires. And 43% report that ambient noise in the classroom distracts students from tasks that require focus.

Headsets with microphones have the potential to address both of these problems by amplifying the teacher's voice so that she does not have to speak so loud it makes her hoarse and by

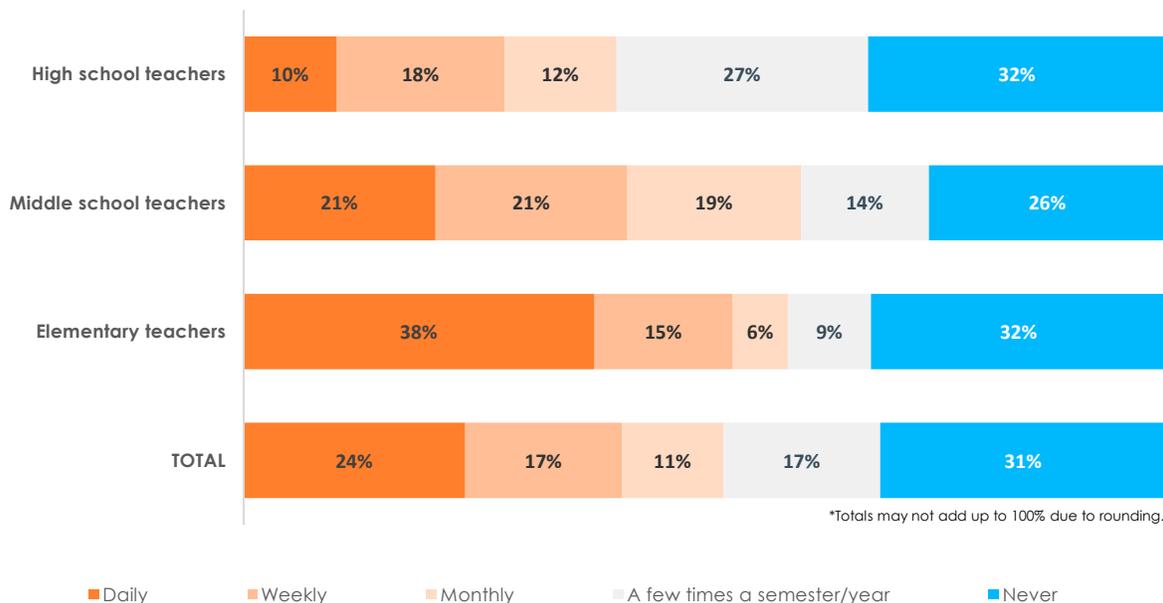
reducing distracting noise during times when students need to focus on individual tasks.

"We learned during the pandemic how valuable teacher microphones can be," a high school principal in Minnesota wrote in response to an open-ended survey question. **"We used them due to the masking, but many have continued because it saves their voices and students stay better engaged."**

Despite their potential to reduce the strain on teachers' voices and block out distracting noise in the classroom while students work, just 10% of high school teachers (and less than 40% of their elementary peers) say they use headsets on a daily basis. Nearly 1 in 3 teachers never use this tool. (Figure 9)

Figure 9

Headsets with microphones: Frequency of use in the classroom*



Ergonomic challenges while using edtech have the potential to impact not only students' bodies but their minds if discomfort makes it difficult to maintain the stamina required to focus on learning. But these challenges are not insurmountable. Survey results suggest several ways to improve students' levels of physical comfort while using technology while also using hardware accessories to enhance the overall physical comfort of the classroom learning environment:

- **Increase Awareness:** Responses to open-ended survey questions indicate that educators may not be addressing ergonomic challenges because they are unaware that they exist and/or unsure how to address them. A simple first step might be to ask students about their levels of physical comfort while using educational technology in order to pinpoint any problems and identify solutions. Because teachers and administrators have different perceptions of the level of effort currently made to help students use technology comfortably, school and district leaders should also consider asking teachers how they currently approach this issue.
- **Offer Professional Development:** Teachers who have received sufficient training on edtech and ergonomics are more likely to say they make an adequate effort to address these issues with students. However, less than half of teachers say they have received this kind of training. More and better professional development could help teachers instruct students on using educational technology in ways that don't detract from learning by causing soreness or fatigue.
- **Highlight the Ergonomics-Engagement Connection:** Survey results suggest that teachers who make more of an effort to help students use technology in ways that do not lead to pain or fatigue are more likely to say their students remain engaged while using edtech. Educating teachers about the connection between physical comfort and student engagement might encourage them to address this topic with their students.
- **Use Hardware Accessories to Their Full Potential:** Hardware accessories can enhance the comfort of the learning environment (e.g., by making it easier for students to see and hear instruction) while also reducing ergonomic challenges related to using devices (e.g., by making it more comfortable for students to keyboard or draw). Making more and better

accessories more widely available could address challenges such as teacher voice strain that predate today's technological innovations while also helping students maintain their focus on instruction by making edtech more comfortable to use.

- **Expand Influences on Edtech Purchasing:** Currently, ergonomics are not a major influence on purchasing hardware accessories, survey results suggest. As a result, districts may be unintentionally buying items that are the wrong size, shape, or type for students to use comfortably. They may also be missing out on chances to use these tools to enhance the physical comfort level of the overall learning environment. Although teachers and their students are the end users of edtech, administrators typically make the purchasing decisions. Most teachers surveyed (83%) say they have too little influence on purchasing hardware accessories. To ensure that technology is used to its full potential, administrators should consider gathering more teacher feedback prior to making purchasing decisions so that they buy items that meet classroom needs.

These simple steps have the potential to not only improve physical comfort but to increase student engagement and learning.

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