

CREATING HEALTHY SCHOOLS BY IMPROVING IEQ

HOW INDOOR ENVIRONMENTAL
QUALITY BOOSTS AND PROMOTES
STUDENT PERFORMANCE



VIEWPOINT



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INTRODUCTION: Hi, and welcome to Schools In Focus, an 1105 Media podcast. I'm your host, Matt Jones, senior editor of *Spaces4Learning* and *Campus Security & Life Safety*. My guest today is Kristin Moore, the Vice President of Market Segments at Armstrong World Industries. We'll talk about the importance of indoor environmental quality in creating and maintaining healthy learning spaces for kids. We'll cover initiatives like the Armstrong Healthy Spaces Ecosystem, the Clean Air in Buildings Challenge, and the Lancet COVID-19 Commission. She'll also provide some suggestions on how schools can use ESSER funds to address environmental quality issues in schools before the funds expire. This episode is sponsored by Armstrong World Industries.

SPACES4LEARNING: Hi, everybody, and welcome to Schools in Focus. I'm here with Kristin Moore, Vice President of Market Segments at Armstrong World Industries. Today we'll talk about creating a healthy school by improving indoor environmental quality (IEQ) and take a closer look at how building materials impact students. Kristin, thanks a lot for being here.

KRISTIN MOORE: It's great to be here, Matt. Thanks for inviting me.

S4L: Of course, any time. First of all, can you tell me a little bit about yourself and your professional background?

KRISTIN: Sure. I'm a recent addition to Armstrong. I met the Armstrong team a couple years ago in my previous role working in modular construction. So, I've been very much involved in indoor building solutions in education and in healthcare, and really looking at innovation around how we build our spaces and how we can build spaces that are going to have better outcomes for the folks that are in there—either learning, or living, or working, or healing. I'm always excited about companies that are trying to do better.

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S4L: Yeah, definitely. I think that's what we're all trying to do, as best we can. Can you tell me, at the broadest level, how does IEQ impact students?

KRISTIN: Oh, it's interesting. I think indoor environmental quality is something that there's been a ton of studying about it, but it wasn't until recently that it became really apparent how important indoor environmental quality actually is. At a very broad level, the time that kids spend in school, when you look at the cumulative years, they're going to be there probably around just over 15,000 hours in school. And so, the school building has a significant effect not only on students' health, but also on their ability to learn. And, unfortunately, schools are one of the largest sectors of public infrastructure spending, but they're also something that's dealt with a lot of cuts.

And so, when you start looking at our public-school systems in the districts, about 54 percent of public-school districts need to update or replace multiple building systems or features in their schools. And we've got aging infrastructure, and the health impacts of a well ventilated school—like I said—are super well studied. They include things like decreased risk of viral infections, decreased reports of asthma and symptoms; there's fewer sick building syndrome symptoms. There's improved satisfaction with indoor air quality. But most importantly in schools: reduced absenteeism.

And there's lots, as I said, lots of studies out there. There's one in particular that I'm thinking about that



looked at 435 different elementary schools, and they found that reduced outdoor air ventilation rates were associated with a 10–20-percent increase in absences. So, the data is there. We can see what impacts schools have on learning for kids, either learning loss or having a better learning environment. It's an important discussion to be having.

S4L: So that direct correlation between IEQ and student absenteeism, is that the biggest way that increasing the quality of their environment keeps kids in the classroom and keeps them in school?

KRISTIN: I think you have to look holistically at the spaces, because there's a lot of different moving parts within a school. But if you focus on what the pillars of a healthy space are—typically, they're things like air quality. What is the lighting doing in the



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space? What is the sound doing in the space? And, what is the temperature doing in the space? And if you have an imbalance in one of those things, then you’re going to start seeing some challenges with how those kids are learning or being impacted, health-wise, in those spaces.

S4L: Can you tell me a little bit about the Armstrong Healthy Spaces Ecosystem? Because I think that includes a few of the different components that you had just mentioned.

KRISTIN: Yeah, definitely. I mean, we recognized the urgent need for healthy spaces solutions that support indoor environmental quality. We’ve been looking at healthy building thought leaders, institutions such as the International WELL Building Institute and Harvard University’s T.H. Chan

School of Public Health, and really seeing how they have identified IEQ as influencing multiple factors. And we recognized at Armstrong, we actually play in several of those very important fields. So, you know, in light of the pandemic, I think that’s what sort of brought this on everybody’s radar. It really highlighted the pressing need for indoor air quality, and for all four components to be critical for overall physical and psychological well-being and productivity in that space.

And so, if you look up, the ceiling plays a really big role in that. The ceiling can help impact acoustical considerations. If you have a gasketed ceiling tile, that can help contain air in the space so we’re not using as much energy to either heat or cool that space, or have ventilation literally leaking out of the environment.

Armstrong is really innovating around how we clean the air. And so, again, using the ceiling as the foundation in the environment to be able to bring in different solutions that are going to be sustainable, long-term solutions—not solutions that we pulled in during the COVID crisis as sort of emergency solutions. I think every classroom had a HEPA filter in the corner, plugged in, creating a huge amount of noise.

Well, how can we look sort of future-facing, and how can we create sustainable solutions? Armstrong has a really innovative solution called VIDASHIELD, which actually uses known technology that is very, very familiar in healthcare environments. It’s like, if they’re using this to disinfect in healthcare environments, why don’t we bring it over to education? And so, the VIDASHIELD actually incorporates MERV filters and then uses fans to bring the air up into the device, which rests in the ceiling, and passes that air through a MERV filter. Then, more importantly, it passes it over encased or enclosed UVC tubes that actually disinfect the air before discharging it back into the space. And, you know, the impact of this is huge in an environment. And if we can bring these sorts of things to the table, this sort of innovation to the table, it’s just going to create better outcomes—not only for the kids in the spaces, but also the staff that have to work to keep those kids in those spaces learning.

S4L: Right. And then, while we’re talking about ceilings and how they improve indoor environmental quality, can we talk a little about—we’ve talked about air purification. But can we talk about some things like acoustics and lighting?

KRISTIN: Yeah, absolutely. So, acoustics play a really big role in learning. And when you start looking at what sound attenuation looks like, think about if you’re in a really noisy space—like, go into a kids’ cafeteria in a school, and the noise reverberation



and that sort of thing in there—if we can actually create better acoustical control in the space, it helps reduce the penetration of environmental noise. And it can reduce indoor noise or background reverberation, which makes it a lot easier for teachers to communicate with the students—which, again, promotes learning.

You know, if students don't have distractions by sound, noise exposure has been negatively associated with impairments to listening, to speech comprehension, to concentration, to understanding of verbal information and reading comprehension. It does have a big impact. There was a really interesting study where they looked at primary-school students, and if there was an increase in noise level—and they measured it by decibels—10 decibels' increase in noise level brought about an average of 5.5 points lower in a math test score, just directly correlated to noise levels.

So, it becomes really important to look at that, because I just think of myself in a situation like—I think of myself in a noisy restaurant, or I think of myself in a just a noisy environment. How does that make me feel? How can I concentrate? What's the energy like? Do my anxiety levels get higher? So, we need to have that sort of power of attention in those classrooms, and acoustics plays a huge role in that.

S4L: Could you give me an overview of the Clean Air in Buildings Challenge?

KRISTIN: Yeah, I can definitely give you an overview of the Clean Air in Buildings Challenge. The Clean Air in Buildings Challenge was just launched by the government in March. And it's really a call to action for building owners and operators—in specifically schools, colleges and universities—to really assess their indoor air quality and look at how they can improve ventilation and air filtration in their buildings. The EPA has issued, basically,

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a set of guiding principles and best practices to assist building owners and operators with reducing the risks from airborne viruses and contaminants indoors. And so, the Clean Air in Buildings Challenge highlights a range of recommendations and resources all around availability for improving ventilation and indoor air quality, which can help to better protect the health of building occupants and reduce the risk of things like, you know, what you saw with COVID-19 and the spread.

The key actions outlined in the Clean Air in Building Challenge include, hey, create a clean indoor air action plan for your space. How do you optimize the fresh-air ventilation that's required? How do you enhance air filtration and cleaning? And, most importantly, how do you conduct community engagement, communication, and education? So that's sort of a high-level viewpoint or overview of what that Clean Air in Buildings Challenge is.

S4L: And one thing that, I think, is kind of interesting is that COVID hasn't necessarily caused as many problems as it has very much exacerbated ones that were already existing. Because, I went to school, and my mom was a teacher for a long time. And it was pretty common to hear about, you know, some bug that went around the classroom and she had like three or four students out today. And I think that was just one of those things, where, a couple times a year during flu season, there were just those couple days when three or four students will be out

because there's something just going around in the school.

So I think, even though this has been brought to the forefront by COVID, it's the kind of thing that's always been a problem, or always been an issue that needs addressing. And as long as, you know, we're still getting flu shots every year, it'll probably still be something that we'll have to focus on in the future.

KRISTIN: Yeah, and I agree with you. I think, definitely, it came to the forefront because of COVID. But when you start looking at just, what keeps kids out of their seats? Well, asthma issues are huge in schools—particulates in the air. You think about the states where forest fires have been a huge issue. Well, that's been a big problem for indoor air quality for those kids. And the problem with all of that is, if my kid isn't attending school, guess what happens to the overall budget and funding for that school? Attendance drives school funding. So, if we have loss of funding due to a reduction in school attendance—and a lot of that can be exacerbated by enduring poor IEQ factors—that hits the school's bottom line, period. The math around that is, they look at the sum of attendance counts and they subtract the days of instruction. And then, they come up with what's known as an ADA, or an average daily attendance. So, just as an example, if a student misses nine days of classes during the 180-day school year, the district loses 5 percent of the funding that a student with perfect attendance would generate.



“So, of the \$122 billion in federal money that’s been set aside, 93 percent is still unspent. And it could be lost if it’s not used by the deadline.”

S4L: Oh, wow.

KRISTIN: So, this has a direct correlation with the money that those schools get. There should be an incentive to keeping those kids in those seats. And how can we do that? Well, we can do it by really looking at our indoor environmental quality.

S4L: Can we talk about the Lancet COVID-19 Commission?

KRISTIN: Yeah, so the Lancet COVID-19 Commission was really created to help speed up global, equitable, and lasting solutions to the pandemic. It’s really about effective solutions being found on the basis of global cooperation. It’s just sort of something that was launched in July of 2020 to really look at, how can we pull together to come up with solutions around COVID? But I think something that might be more important to talk about would be the ESSER funds.

S4L: Yeah, yeah, definitely. How can schools best utilize their ESSER funds to address IEQ improvements?

KRISTIN: Well, I think it’s interesting. So, the ESSER funds came out, and literally, there were billions—actually trillions—of dollars that were sent out as part of ESSER. The federal government created these funds to really aid in the impacts of Corona and bring some relief and economic security. And so, they distributed these funds to states based on each state’s proportionate share of Title I funding from 2019. So really, the funds were intended to support COVID-19 response efforts.

And there is a huge, wide range of allowable activities. Some of the things that the funds can be used for are building improvements in construction. School facilities can really look at, hey, let’s start repairing and improving some of the things that we’re seeing, or have seen, that have cropped up in our school based on what was going on with COVID. So, you know, improved air quality. It can be put towards inspection, testing, maintenance, repair, replacement. It can be put towards filtration, purification, and other cleaning fans; control systems; lots of different things.

But, it’s really interesting. There was an article that came out on May 18, from *The Wall Street Journal*, and the headline for that was “Billions in School COVID Relief Funds Remain Unspent.” So, of the \$122 billion in federal money that’s been set aside, 93 percent is still unspent. And it could be lost if it’s not used by the deadline. What it really outlined was that U.S. school districts are really struggling to spend the billions of dollars in federal pandemic relief money. And I think there’s a real pressure in, how do you show something for the money that you’ve spent? Because I don’t think there has been really good guidance given to this school board.

So, there’s some really key deadlines coming up, where your ESSER I funds have to be spent by Sept. 30, 2022. Otherwise, you lose them. The ESSER II funds have to be spent by Sept. 30, 2023. Otherwise, you lose them. And then the final ARP ESSER III funds have to be spent by 2024—Sept. 30. So, there’s money that’s sitting there for schools to use, but it’s literally just still sort of sitting there.

That’s one of the things that Armstrong can help out with, is really looking at: How do we improve that air quality and bring solutions to the table that are gonna fit best for the school that is looking to improve that indoor air quality? It could be things like ceiling tiles. It could be, like, let’s improve the acoustics in the space; let’s improve sound attenuation. Going from room to room, let’s improve the air quality—maybe by looking at filtration or by VIDASHIELD units that are able to actually create a long-lasting solution in those spaces. And one of the things that we actually have been doing is a bit of a pilot program. And I know that one of your previous podcast talks was around sensors. And that’s one thing that schools can be looking at: getting the data about what that space is actually performing at, to be able to basically come up with a list of, okay, this is a high



priority based on the data that we're getting back.

S4L: And then, when we're talking about using ESSER funds to address IEQ improvements, obviously, indoor air quality—IAQ—has kind of come to the forefront in the last couple of years. But it's not the only important component of indoor environmental quality.

Do you know, are there ways that schools can spend their ESSER funds on other aspects of indoor environmental quality besides air quality?

KRISTIN: Yeah, definitely. They can be using their funds to really look at, again, going back to that Clean Air in Buildings Challenge. The Clean Air in Buildings Challenge is really looking holistically at, like, how can we enhance air filtration and cleaning? How can we optimize fresh air ventilation? This is specifically for schools to be able to get some guidelines, and those ESSER funds can be used to start bringing up the schools to start responding to the Clean Air in Buildings Challenge.

S4L: Do you have any specific recommendations? We have a lot of K–12, higher ed facilities listeners who are listening to this podcast. Do you have any ideas for some first steps, or some kind of very small, concrete steps that they can take to get the ball rolling?

KRISTIN: Yeah, definitely. I think, coming into the space, just look up. What is the condition of the ceiling tiles? What kind of ceiling tiles do you have in the space? Sometimes, it can just be a simple renovation or retrofit of just the ceiling tiles to make a huge impact in that environment. The other thing I would recommend would be looking at the VIDASHIELD, you know, placing those in classrooms. But even placing those in things like the nurse's station...you know, where do the sick kids go while they go and wait at the nurse's station until mom or dad comes and picks them up? So, being able to have something like that in there could have a huge difference. And



so, you can definitely reach out to any of us at Armstrong. We're happy to come in and do a bit of a review of what's going on in this space and be able to make some recommendations.

S4L: I think we're coming up on the end of everything that we'd had prepared. I just wanted to ask if there was anything else that you wanted to get in: any kind of loose words or thoughts that kind of popped to mind that you want to make sure to add to the conversation?

KRISTIN: I think just to add, you know, air filtration and that sort of thing. When we look at how we can reduce things like particulate-matter pollution through in-ceiling air filtration, again, that can help mitigate the risk of infectious disease transmission. Like you said, that can be flu or whatever, but also being able to reduce the exposure to pollutants. There's a lot of higher-allergen exposure in schools that are independent of the home environment. It's really associated with increased asthma symptoms and decreased lung function, and asthma causes 14 million missed school days per year and billions of dollars in healthcare costs. And so, again, I think just looking holistically at what we can be doing in those spaces and maybe get out of the comfort zone a little bit, and look at what is innovative out there and what can have an impact.

S4L: Unfortunately, that's about all the time we have for today. One more time, Kristin, I really did want to say thank you so much for being here. This has been great. This has been a lot of really helpful information, and I think that our listeners are going to get a lot out of this. This is a really important issue that schools are facing, and I think that if they have the funding available, then there's ways that they need to use it. But they also might need a little bit of help in terms of ways that they can use it, and I think this will be perfect. This will be great for those schools who kind of have that money burning a hole in their pocket, and they're not quite sure what to do with it. So, thank you!

KRISTIN: Thanks so much, Matt. Really appreciate your time, and schools are important, and we want to be able to help support creating positive outcomes for kids.

S4L: Yeah, always! One more time, that's about all the time that we have for today. Thanks to our guest, Kristin Moore, the Vice President of Market Segments at Armstrong World Industries. Thanks to this episode's sponsor, Armstrong World Industries. And finally, thanks to all of our listeners for tuning in, and we'll see you next time on Schools In Focus.