Learning in Motion

The History of School Furniture


BUFFON

Learning in Motion

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Foreword:
Learning in Motion

Through more than three decades of dedication to the best of educational building science, *Learning By Design* Magazine celebrates the inherent interdependence of learning and design as the fundamental basis for our experiences in life. As such, we are honored to partner with long-time advocate and industry insider VS America to explore Learning in Motion in this special publication.

Founded in 1898, the VS story offers incredible insight into the history of modern mass education during the tumultuous 20th century. This is a study of a German school furnishing manufacturer's determination to thrive through continual social change by pursuing design innovation to improve learning. Beginning with the Industrial revolution era and stretching 126 years to the present, Learning in Motion explores a brief history of the school desk, educational architecture, and how learning and design are intertwined as presented in *The Classroom*, a book published by VS in 2010. Likewise, the VS Museum of School Furnishings offers a fascinating glimpse into a collection devoted to the history and heritage of design for pedagogy as experienced through the school desk and chair.

Tying it all together is the innate need for movement as part of the physiological and psychological requirements of being human. Here, Learning in Motion considers the ergonomics of education and what motivates children in varying age groups to move while illuminating the necessity of movement for well-being in all aspects of life. These are the lessons and insights gained over generations of learning as experienced by one family-owned business determined to help create the best possible learning environment.

Please enjoy this copy of Learning in Motion by VS America. We hope these insights inspire you to reconsider your work in 2025 and beyond.

Sincerely,
Mark Goodman
Publisher
Learning By Design Magazine

Two-seater school desk, around 1890.
Buffalo, NY (United States)

School desk and chair,
around 1930.
VS, Tauberbischofsheim
(Germany)

Skid chair and desk by
Karl Nothhelfer, 1950.
VS, Tauberbischofsheim
(Germany)

Single-seater classroom workstation, around 1958.
Heywood & Wakefield Co., Gardner, MA (United States)

The Development of School Furniture as an Industrial Product

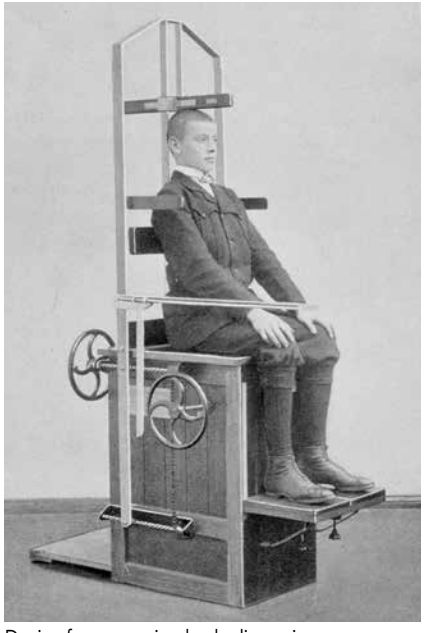
Taking parallel tracks, design and education are so intertwined as to be more than symbiotic. They are, in fact, inseparable – such that neither would exist effectively without the other.

Beginning in the early 19th century and stretching to the present, the history of the German school desk and chair illuminates the complicated processes of global social change compelled by the Industrial Revolution. As mechanization spawned new industries of many sorts, the early years of coal-fired power production had a profound impact on many aspects of life including education and architecture. Concurrently, by the end of the 19th century there was also a tremendous upswell in appreciation for science. Modern medicine was emerging along with a growing sense that science could lead to answers to all of life's social and economic problems.

In Germany and The United States, compulsory education became essential to enhancing national economic capital. This led to a boom in school construction worldwide, and consequently, a tremendous demand for school furnishings.

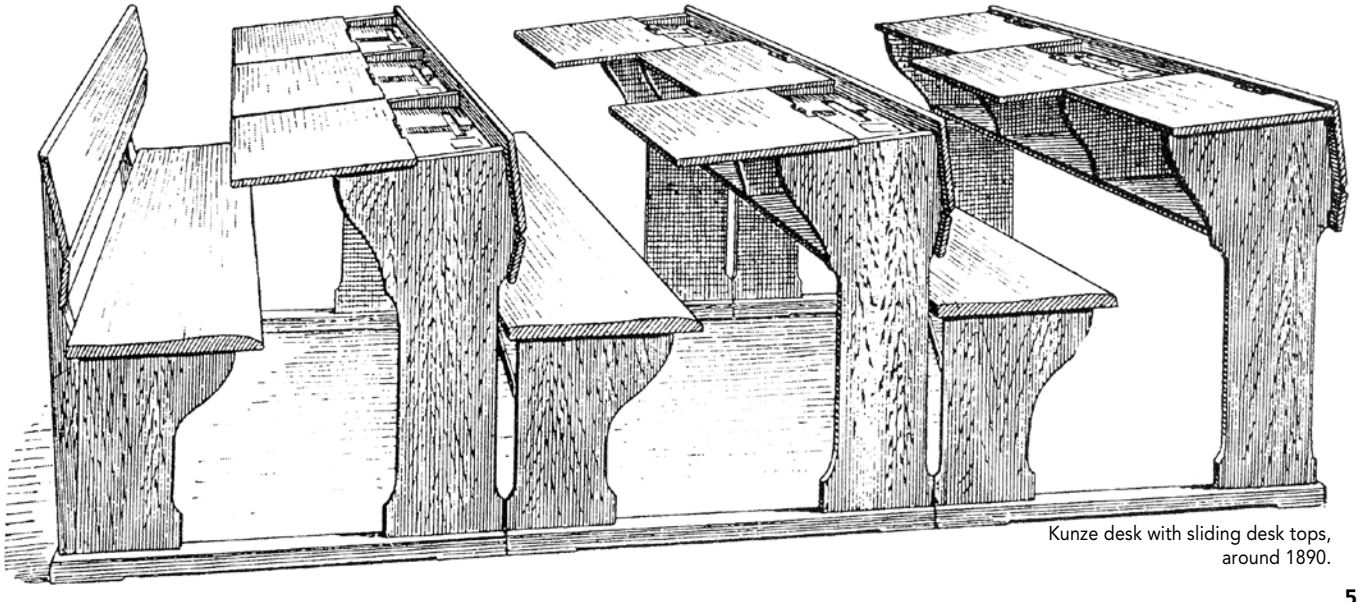
In 1901, school furniture manufacturer P. Johannes Müller surmised that '*Germany's future rests on the school desk*', a sentiment that becomes increasingly informative as the history unfolds.

One of the early drivers in the fundamental equation of what makes a school desk good, at least in Germany, was ergonomics. By the early 20th century there was widespread understanding of the underlying orthopedic causes of spinal disorders. Postural weaknesses caused by education were mainly connected to poor posture when writing. So, designing furnishings that were a right fit for human beings in various postural modes became a central objective of any good design and remains so today.



Device for measuring body dimensions, invented by Dr. Paul Stephani, around 1900.

19th-century desks and seat combinations offering individual adjustability, lumbar support, and a slanted writing surface were intended to ensure correct posture.



Kunze desk with sliding desk tops, around 1890.

Post-war, new materials like bendable plywood and fiberglass-reinforced plastic led to many innovative furnishings. The ability to stack chairs when not in use was advantageous as demonstrated by these popular Charles Eames designs for Herman Miller.

As the 20th century dawned, the radical changes in society triggered by industrialization were also reflected in furniture design. What is interesting about the German response to industrial mass production was the insistence that both design and craftsmanship both have a voice in the conversation. By 1907, an association of progressive designers and companies known as The Werkbund was formalized to infuse the manufacturing process with an appreciation for craftsmanship. The ethos that stems from this insistence can be well-regarded as the basis of modernism, or the idea that architecture ought to respond to the needs of the users.

Appreciating the vast variation in the size of the human form, the ideal German school desk would need to come in several sizes to accommodate students of different heights; have a sloping desktop to avoid hunched backs; and should have a seat that supports the lumbar vertebrae with an appropriately shaped backrest. Variability extended to multi-seat desks, adjustable backrests, and sliding desktops that allowed multiple students to use the same piece of furniture simultaneously in the way most comfortable and appropriate for their task.

By the early 1920s, advocates of educational reform in Germany disapproved of the rigidity of school desks. They hoped instead to allow students and teachers to arrange school furniture for group teaching, and group, pair, or individual work assignments as needed. Meanwhile in the social realm, after more than a century of industrialized progress, in Germany and elsewhere, a youth movement clamored for a return to nature. As modern, indoor living became the norm, a craving for exercise, sunshine, fresh air, and experiences with nature became a central lifestyle theme. It is at this intersection of time and place that the cultural reorientation of German society spawned a design revolution known as Bauhaus.

One of design's most inspirational movements, Bauhaus specifically took up the challenge of unifying individual artistic vision with the principles of mass production by placing design's primary emphasis on function. The profound result of this 'substance-is-style' approach to design is now so ingrained into modern architecture and furnishings that it has virtually vanished into the background.

As far as students are concerned, school architecture and furnishings within it are essentially one thing, not two. The seat is merely the moment where the occupant contacts the building. Between 1935 and 1955 French architect

School chairs in different sizes around 1958.
Brunswick, Chicago, IL (United States)

and designer Jean Prouvé began making a chair-desk combination inspired by aircraft construction that used cross-sections of tubing, tapering sheet steel profiles, and drawn steel, a move that revealed the production efficiency of non-wooden materials.

After the Second World War, the conversion of the armaments industry led to the introduction of other new materials – pressure-cast aluminum chairs, high-strength plywood components, and eventually glass fiber-reinforced plastic. The iconic fiberglass reinforced plastic chair by Charles Eames for American furniture manufacturer, Herman Miller, offered colorful style and the ability to be stacked for storage. In post-war West Germany, under the influence of Western allies, the educational goal was to satisfy the individual needs of the child to enhance their independent judgment and corresponding autonomy. School curricula were revised, experimental teaching strategies were explored, and the rigid fixed position school desk was firmly and finally banished.

The piece of furniture that had the greatest impact on the development of German school furniture after the Second World War was the skid chair. Designed in 1950 by Karl Nothhelfer, patented by Falk Müller and produced by VS, the skid chair was innovative for a two-legged design. Simple, elegant, and balanced, combined with the matching table, the skid chair allowed optimum freedom of leg movement.

The PantoSwing Chair by Verner Panton for VS is a two-component classroom chair that came to market in 1996. With around 300,000 units produced a year, ten years after launch, this became the standard chair used in German classrooms.

The design of VS schools chairs 1950-1997 reduced the amount of components and improved ergonomics.

The Long Struggle for the Child-friendly School in Germany

Just as design and education are functionally co-dependent, public education and public governance also maintain a degree of inseparability. Founded in 1871, Germany's first century as a nation was marked by profound social and economic upheaval.

In 1900, Swedish teacher Ellen Key published a revolutionary book on education, *The Century of the Child*, which postulated a pedagogy based on drawing out and nurturing the best in each learner rather than the continuance of a one learning style works for every student teaching practice. This was a time of rapid global industrialization and urbanization, so many countries were building new schools simultaneously.

To this point, in Germany education existed on the primary, middle, and secondary school levels. However, most learning took place in multi-story buildings designed purely for functionality. Modeled after military barracks or monasteries, schools built before the turn of the 20th century typically strung indistinct classrooms along gloomy corridors without concern for specialist learning rooms, outdoor playscapes, or pleasant dining experiences for students or teachers. As articulated in the work of Keys and others, calls for educational reform grew in opposition to teaching methods that stifled a child's spirit and imagination and building forms that depersonalized the individual. Progressive educators instead sought to promote creativity through exposure to art, daylight, and fresh air.

Another key objective in the quest to actualize the child's internal self was an emphasis on self-directed activity, intellectually and vocationally, learning by doing. By the early 20th century workshop lessons, handicrafts, drafting, gymnastics, cooking, biology, and gardening were all part of an expanding curriculum in Germany and elsewhere.

As with pedagogy, school architecture also began evolving. Reformers often chose to build new schools prominently within housing estates – significantly elevating the building's social stature to that of a church or government building. The design brief on the early 20th-century German school now required a multi-purpose facility with classrooms, an assembly hall, a gymnasium, science rooms, specialty rooms, and gardens. Reformist architecture also stressed the importance of natural light, functional furniture, and, of course, ergonomic desks.

Within the classroom, learning modalities were changing as well. Germany's 1919 Weimar constitution made primary school compulsory. More significantly, it stipulated that education should include not only chalk and talk lecturing but also experiential learning through group work.

Fritz Schumacher, a German architect responsible for more than 30 new schools built in Hamburg, Germany before 1933 surmised:

Schools have become the most important public-sector brief in the post-war era. Rarely are intellectual movements so clearly reflected in buildings as the educational movement of the post-war years which wanted to teach children to understand nature, find pleasure and creativity, physical activity, and music, instead of simply subjecting them to purely repetitive task memorization.

As the design-forward ethos of the 1920s started to take hold, furniture manufacturing moved to the less-is-more minimalism that defines modernism.

Modern Thonet edition of the child's cantilever chair by Mart Stam dating from the 1930s.

At the Protestant Comprehensive School, designers worked with students, teachers, and the community in a long partnership to reimagine the modern school. The result is a small town with a central plaza, streets, restaurants, theater, library, and secluded spaces animated by a rolling stream, indoor/outdoor experiences, and views in every direction.

The most successful architectural model for a school during the Weimar Republic was a pavilion-style school. This open-air concept required a large site, often necessitating a suburban condition. Pavilion-style schools set a tone for the future of education as a collection of single-story, stand-alone buildings connected spatially by exterior spaces in a park-like setting. They offered practical flexibility by incorporating indoor and outdoor learning environments. With buildings designed as squares rather than rectangles, interior spaces were daylit from two sides and provided cross ventilation, while flexible, lightweight furnishings facilitated group learning. Other open-air schools demonstrated similar thinking in Amsterdam, Paris, and Switzerland.

The Second World War was a devastating moment in human history for many reasons. In Germany, the Nazi Party stamped out all the endeavors of the educational movement and replaced them with complete obedience. In education and German civic life, in general, the Nazi slogan "You are nothing; your country and its people are everything," ruled the day. At the close of the Second World War, a divided Germany saw education take opposing tacks –East and West – as the Cold War era began. In East Germany, education and architecture during this period were characterized by strict discipline, standardization, a focus on achievement, and blanket politicization. Conversely in West Germany, the intention was to organize education around democratic principles and school architecture immediately returned to the design intent set forth by the pavilion-style schools of the pre-Nazi Weimar Republic.

A return to reformist thinking re-emphasized the need for school architecture to reflect the educational attitude to occur within. Swiss architect Alfred Roth summarized the sentiment in his compendium, *Modernism after the Second World War*.

Whereas in the past education has seen children as passive objects, recipients of their attempts to foster a one-sided development of the intellect, today they are regarded as autonomous subjects, who should be encouraged to assimilate experiences and engage with life in their own unique way.

Among key components, new school architecture appreciated a square plan rather than a rectangle and light stackable furniture. Both facilitated the highly regarded group work and flexibility expected of the progressive classroom. One of the most successful examples of post-war architecture for education is the Geschwister Scholl School in Lünen designed by Hans Scharoun. Still respected today as a fore-bearer of truly modern educational architecture, among many noteworthy features, the design is famous for initiating a new kind of classroom that the architect called a "school apartment" for its incorporation of an entrance hall with cloakroom, the main classroom, a room for group work, and a connected garden courtyard. The Gerschwister Scholl School is a clear example of the architecture's response to the demand for child-centered learning in the face of radically changing socio-political forces.

West Germany's decision to abolish the fixed position wood school desk after the Second World War was perfectly timed to welcome the skid chair. The space-saving, stable design was perfectly suited for the active, inquisitive learning educators hoped to inspire.

Multi-purpose stacking chairs. *VS, Tauberbischofsheim (Germany)*

Children's chairs by Arne Jacobsen. *Fritz Hansen, Allerød (Denmark)*

Skid chair by Karl Nothhelfer, 1950. VS, *Tauberbischofsheim (Germany)*

Photo © James Steinkamp Photography

Connecting the Learning and Learning Environments

Whereas furniture and architecture are man-made objects of understood functional purpose and practical worth, learning is abstract, amorphous, and often a matter of contention. Indeed, what an education is, how to dispense it, and how to quantify broad success remains a challenging conversation.

The history of school furnishings unpacks far more than just the quest to accommodate the need for a place to sit while learning. Tracing the evolution of the school desk and chair from the post-industrial revolution period through the 21st century offers a framework for understanding changing considerations in manufacturing technology, educational philosophy, school operations, social ideals and progress, ergonomics, and design philosophy. Topics that substantially shaped the quality of life in Germany, The United States, and across the globe.

One of the finest examples of connecting learning to learning environments in the U.S. is Crow Island School in Winnetka, IL. Designed collaboratively in 1939 by Eero and Eliel Saarinen and Perkins, Wheeler and Will, Crow Island School is widely recognized as the first modern school in The United States. Crow Island School indelibly defines the critical intersection of educational design, architectural design, and furniture design as fundamental to the learning/teaching experience.

Considered the first modern school building built in the U.S., Crow Island School is noteworthy for classrooms designed to accommodate learning on multiple scales of interaction: whole group space, small group space, outdoor classroom, and large group space.

Chicago History Museum, Hedrich-Blessing Collection; Kenneth A. Hedrich, photographer

To facilitate the new dynamics of multi-modal learning, educators needed furniture that facilitated the school building's flexible use. A lightweight and functional collection was designed by Charles Eames and Eero Saarinen.

A repeating classroom model allows students and teachers simultaneous access to spaces for whole group, small group, and individual work. Classrooms also offered spaces for academic instruction, active learning, outdoor learning, instructional storage, and restrooms. Together Charles Eames and Eero Saarinen collaborated and designed a collection of lightweight school furniture that accommodated the need for flexibility between class, group, and individual learning activities.

Still standing the test of time today, perhaps the most important lesson to learn from the success of Crow Island School is that when educators, architects, and furniture designers develop a mutual understanding of educational goals, the resulting educational experience has a far greater chance of meeting expectations.

Historically, school buildings are built to last 100 years. For much of the history of school furnishings, school operations were static enough that school architecture could meet functional requirements for decades with little change. However, since the dawn of the technological revolution toward the end of the 20th century, change has been ever-more in demand. Considering the pace of changing legislation and social attitudes, the increased need for student safety, and every building's critical environmental performance, 21st-century school districts and school designers understand that a school will likely change many times during its functional life. Consequently, a sense of adaptability now informs effective school architecture.

In 2024's hyper-tech society, high performance requires meeting a minimum triple bottom line of environmental, social, and financial positives. As globalization has taken hold through our internet-connected reality, American and German learners can become connected collaborators rather than distant competitors in their job market futures. As such, educational organizations worldwide emphasize student performance, teaching performance, and building performance. School boards expect top marks in everything, despite the financial duress many school organizations face year after year.

Whereas in 1900, when architecture, manufacturing, and craftsmanship interests joined forces to produce the best possible German school desk, in order to develop the best possible architecture and furnishings for tomorrow's educational needs, educators and students must also meaningfully join the conversation. By deploying a strategic sequence of design and educator engagements, as postulated by American architect Peter Brown, collaboration should unfold by defining objectives, educational, philosophy, and intended outcomes, setting the stage for success. Having educators play a role in matching programming to practice enables the resultant design to be responsive to educational objectives

Reimagining the Furniture Project; Dina Sorensen with Peter Brown in collaboration with V/S America, 2018. Crow Island School Winnetka, IL - Eliel Saarinen - Eero Saarinen Architects and Perkins, Wheeler & Will Architects. *Photo © James Steinkamp Photography*

Photo © James Steinkamp Photography

while intrinsically increasing the user's understanding of the architecture, the furnishings, and how they relate to teaching modalities.

In anticipating change, planning and design strategies should prioritize the building and school organization's capacity to address future operational change through flexible planning, flexible spaces, and flexible classrooms. Increasingly, school organizations are intent on assuring baseline knowledge for all. School organizations have implemented learning community strategies to organize students and teachers into small teams to allow for more individual student attention. Schools designed around this should begin with the fundamentals established at Crow Island by offering a collection of adjoining spaces for lectures, group work of varying sizes, individual and paired project work, and presentations.

Schools are also using shifting blocks of time to organize operations. Devoting morning hours to core learning, teachers in elementary settings enjoy uninterrupted blocks of focused grade-level work. In the afternoon, students participate in a multi-grade exploratory process of individual pursuit – music, language, dance, art, athletics, etc. This time also accommodates deeper enrichment or acceleration for students on either end of the bell curve. Elsewhere in middle and upper-grade schools, educators use shifting blocks of time to account for self-directed learning, occasionally through external businesses, community-based programs, even employment.

Since the COVID-19 pandemic, online learning, scheduling, conferencing, and remote reporting now play some part in delivering education. Access to online coursework allows educators to customize content to individual student abilities. Real-time assessments inform educators of progress daily. As technology continues to get faster, smaller, and ever-more connected, as the human network of ideas and information gets bigger, the world becomes smaller. What's next for education? Stewardship.

Inherently, the culture of a school both shapes and reflects the community it serves. Logically, inviting the community to shape and reflect the culture of a school's educational philosophy, architecture, and furnishings is also necessary. The future of schools lies in nurturing a culture of commitment to the educational wealth of all through individual and collective stewardship. Increasing the participation of educators, students, and school operators in the design process can only enhance school architecture. Students participating in the daily upkeep and maintenance of the school, the landscape, gardens, and classrooms will enhance pride. Local businesses and community organizations supporting trade programs, arts, music, and science create a self-sustaining ecology of human interests that allows the school to face change in stride, purposefully.

Education is an opportunity to better the world by giving each child the best chance to be their best self. Achieving this, although supportive, is not about architecture or educators, but rather about the experiences learned in between.

Photo © James Steinkamp Photography

Ergonomics - Bodies in Motion:
Learning Begins with Inner Balance

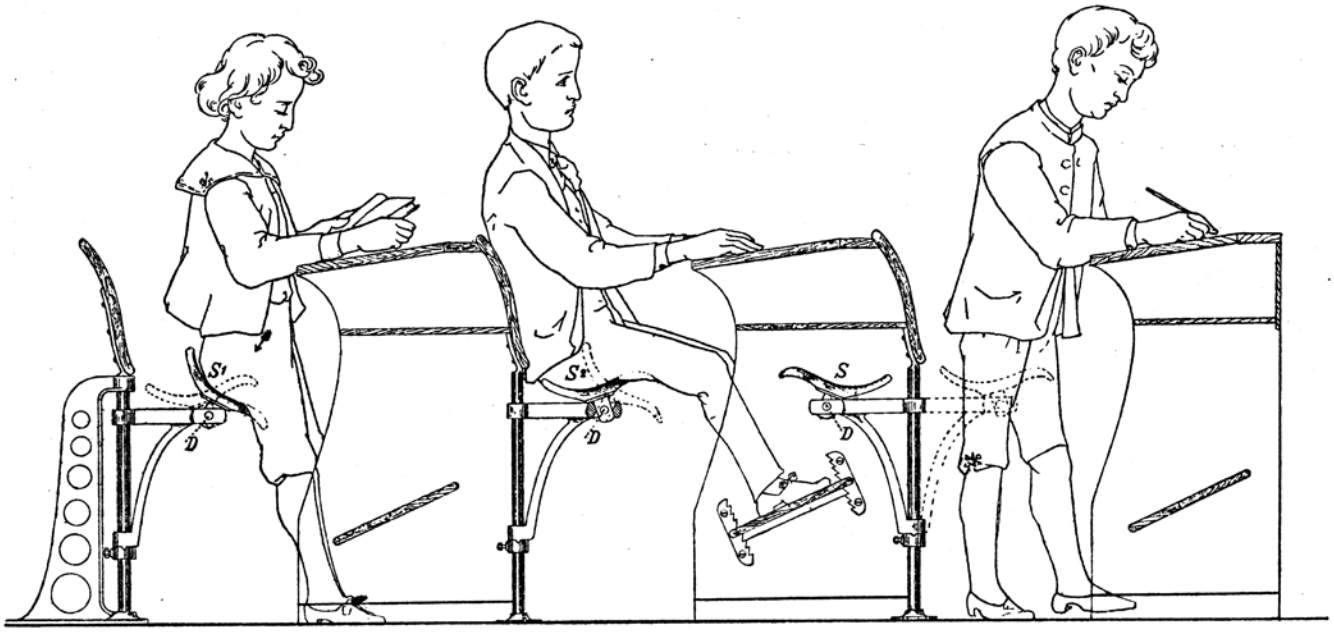
By the end of the 19th century, governments worldwide recognized the need for mass public education as the foundation of national wealth through individual economic capital. Meanwhile in Germany, The United States, and elsewhere people in urban areas were increasingly alarmed by the human health and social concerns (poverty, slums, vice, and exploitation) caused by rapid industrialization. Enter the Hygiene Movement, an international interest in applying science-based knowledge to improving human health and well-being. Understood broadly, the Hygiene Movement involved more than sanitary conditions – it meant access to fresh air, daylight, motion, mental stimulation, and physical comfort. A key element, particularly in education, was ergonomics – studying the physical efficiency of human beings in their working environment. In 2024, despite generations of innovation and evidenced-based improvements to school furniture, the ergonomics challenge remains. Primarily, because the issue of sitting itself has increased exponentially – now to disastrous proportions.

"As human beings, movement is in our DNA," begins Dr. Dieter Breithecker, a health and kinetics scientist and former President of the Federal Institute on the Development of Posture and Movement in Germany. Dr. Breithecker has spent more than 40 years studying the connection between human physiology and metabolic development. "Movement is decisive in the inner balance of mind, body, and soul at the core of human comfort and contentment."

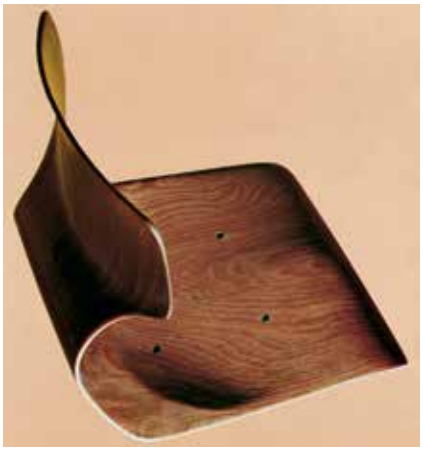
Whereas in 1980, at the beginning of his career, the main concern associated with poor postural health was back problems, Dr. Breithecker reveals the physical ramifications of chronic sitting are worse than previously imagined.

Dr. Dieter Breithecker

Sit/stand desks with adjustable heights, footrests, and individual seats were designed and produced in Germany around 1880.



School desk by Schindler, around 1890. *Basel (Switzerland)*



Seat and backrest shell made of Pagholz, Presswerk AG,1950s. *Essen (Germany)*

During the post-war era, manufacturers worked with many newly imagined materials. In 1958 a process was patented to make seats and backrests out of pressed woodchips bound by synthetic resin. Elsewhere seat shells were made of fiberglass-reinforced plastics and tapering tubal steel subframes.

"Sitting is loading. So, prolonged periods of sitting will lead to back problems," he says. Despite human efforts throughout history to minimize it in everyday life, motion is an intuitive, biological function that is indispensable. "The bigger problem with people sitting in chairs for 10 to 12 hours a day is that this creates a measurable metabolic disorder in our bodies. This imbalance is linked to obesity, Type 2 Diabetes, heart disease, and many forms of cancer. It is not at all an exaggeration to say sitting is the new smoking. People need to stop doing it so much."

Nowhere has the gravitation toward a sedated state of human inactivity been more pronounced than in traditional front of the room facing education instruction. From the first day of school and again at the start of every year, the past perception that sitting still equates to good classroom behavior has been proven to yield less than positive outcomes.

"When you picture an elementary-age child in a school chair, you immediately visualize them rocking from side to side," says Dr. Breithecker. "That is because they are intrinsically motivated to move. This movement is a natural, involuntary physiological behavior the body requires to be in balance. Restricting this movement with a rigid chair or trying to control this behavior through discipline is highly detrimental to learning and the child's physical, emotional, and mental well-being."

Years later, those children will enter puberty, changing their physiology significantly. Not only do they get bigger and stronger, their inner balance shifts. Teenagers are no longer intrinsically motivated to move as younger children are. In adolescence, the mind and body require extrinsic motivation. At this point, activities like sports, band, and afterschool employment incorporate movement into individual identity building.

Asked about remedies for the deterioration of human health and well-being associated with sitting, Dr. Breithecker says the solution begins with choice.

"A learning or working area should offer many options - soft seating, mobile chairs and stools, standing desks and floor surfaces. Users should select the best place for their best learning. They should have full freedom to stand, sit on the floor or move around, so they are well situated for the task they face," he shares. "If there is a school garden or outdoor space, go outside. Walking and talking is highly undervalued as a teaching method. Physiologically, learning while walking and exploring is fundamental human nature wired into us as part of the survival of the fittest."

Beyond choice, Dr. Breithecker shares that as the learner's independence and self-awareness increase, children will move toward actively shaping the learning experience.

"Grade school students often make small acoustic shelters, quiet places under desks or blankets to read. A well-equipped classroom and a thoughtful, patient teacher will allow intuitive behavior to flourish," he says.

PantoMove chair with 3D rocking mechanism, originally introduced as the PantoTurn with 2D rocking mechanism in 1997.

The Flexible School—Fridtjof Nansen School in Vahrenheide, 2000. *Hannover (Germany)*

"Throughout our evolution, humans have interacted extensively with their environment as a key to survival. Still today, our best intelligence remains the innate, intuitive, biological algorithms that reside at the center of the mind, body, and soul, sustaining balance inside each of us."

From his years of research and practical application in classrooms and office environments, Dr. Breithecker's takeaway is that the key to producing high-caliber learners is facilitating self-organization.

"Children must be allowed to self-organize. When humans align themselves with their environment in ways suited to their tasks and individual needs, they will always intuitively choose inner balance and well-being," he concludes. "When they are comfortable, they can focus without distraction on what they are doing. This is when genuine learning happens."

Crow Island School
Winnetka, IL (United States)
Photo © James Steinkamp Photography

The VS Museum:
Museum of School Furnishings in Tauberbischofsheim, Germany

Founded in 1898 through the unification of several emerging German contenders in the mass production of furnishings, today Vereinigte Spezialmöbelfabriken (United Special Furniture Manufacturers), or simply VS is a global leader in school furnishing design and production. Beginning with the Rettig school bench patented by Paul Johannes Müller in the 1890s, the VS story reflects the relentless determination of a family-owned business to thrive in the 20th century.

To commemorate the company's 100th anniversary, under the direction of Dr. Thomas Müller, in 1998 VS initiated a series of projects aimed at preserving the history of school furnishings from Germany and around the world. One such project is the VS Museum of School Furnishings at VS headquarters in Tauberbischofsheim, Germany. Axel Haberer was there from the beginning.

"This is a special and unique museum intended to show how school furniture designs came to market in response to changing pedagogy and production possibilities worldwide," shares Haberer who began his VS career as an assistant to Dr. Müller in 1997. "Dr. Müller has curated this collection of unique school furniture from VS, donations from historical competitors, antique auctions, flea markets, eBay, and Craigslist for more than 25 years now. What I find interesting is that at the beginning of the modernist movement, many significant architects around the world designed furnishings specifically to adorn their buildings. School architecture offers many examples of innovative furniture by Walter Gropius, Charles Eames, Eero Saarinen, and many others."

The museum, free and open to tours by appointment or walk-in when able, offers a first-hand, chronological review of more than 150 pieces of furniture reflecting changes in educational intent throughout the 20th century. Since the museum opened Haberer and his colleagues have hosted designers, educators, and researchers interested in the critical connection between users and architecture as informed by school furnishings and pedagogy.

Rettig desk, 1895.
P. Johannes Müller
Charlottenburg (Germany)

The concept of using tubular-steel for designing tables and chairs was first identified in Germany at the Bauhaus in Dessau. Influenced by this idea the development of tubular-steel school furniture was created in the mid-1920s.

Cantilever chair in the Bauhaus style.

"For architects, interior designers, and educators alike, it is useful to see not just a single phase of design, but a sequence of design phases as they evolved," says Haberer. "Many visitors are surprised to learn how progressive designers and educators were in the early 20th century. In response to the demands of educational reformers, by the 1920s German education focused on the needs of the child. This meant light, air, sunshine, and comfortable, flexible, lightweight furniture to accommodate varying modes of group learning."

One of the most influential design movements of all time, The Bauhaus, emerged during this period in Germany. The Bauhaus became famous for its dedication to design as 'comprehensive artwork,' or the amalgamation of form, function, and fabrication to the user's benefit. The commitment to functionalism coincided ideally with the educational reformists' concept of ergonomically correct furnishings, exposure to nature, sunshine, and exercise as fundamental to healthy childhood development and therefore learning. This intersection put architecture for education at the very heart of modernism; therefore, identifying school furnishings as the soul.

As Haberer points out, this logic wasn't unique to Germany. Crow Island School in the U.S. remains an exemplar of child-centric learning, architecture, and furnishings now nine decades after it opened in 1939.

"The museum is by no means focused on furniture produced by VS or even German furniture in general," continues Haberer of Dr. Müller's worldwide effort to obtain examples of historic school furnishings for nearly three decades. VS honored the collection by developing a worthy space in an old factory building on the VS campus. "We consulted with the curator of the Frankfurt Architectural Museum to design the exhibit space. Then our apprentice shop built out the space and exhibits. Our craftsmen also did some light restoration on some furniture. Remember, some pieces were found in barns and abandoned buildings."

Asked what educators might take away from the experience, Haberer expands on the age-old wisdom that knowledge is power.

"What we want educators to understand is that a chair is more than a seat. Along with the curriculum and content, the chair is

A Jean Prouvé bench from 1952.

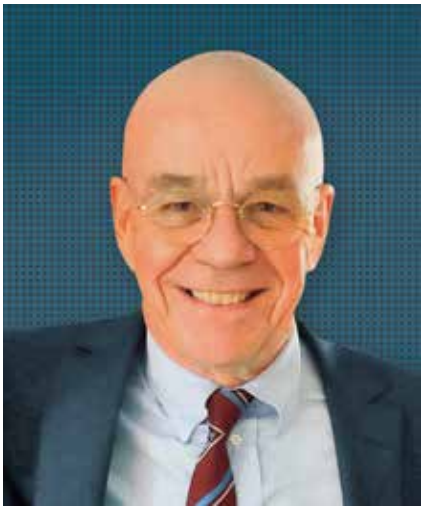
School desk by Walter Gropius, 1935/1936.

The VS permanent exhibition at the company headquarters in Tauberbischofsheim. (Germany). The classroom from the end of the 19th century until today.

the third teacher," continues Haberer. "When we look at the last three decades of product development around mobility, flexibility, and agile learning, school furnishings today contribute significantly to effective learning and teaching processes."

As with history, at the VS Museum of School Furnishings, the big picture is made whole by a series of slight shifts, small movements compounding over time. For Haberer, it is in recognizing this continuum that design has the best chance of making genuine progress.

"Culturally, school furnishings are an important piece of modern human history," he concludes. "As manufacturers, educators, designers, and even the students themselves, knowing your heritage is a pre-requisite for innovation. That's what this museum is all about."



Legacy:

Dr. Thomas Müller Reflects on a Lifetime of Learning

Now in the fourth generation of leadership, Vereinigte Spezialmöbelfabriken (VS) is a family-owned business that has become a worldwide force in school furnishings. Founded in 1898 through the merger of several competitive German furniture makers, the story of VS's success begins with principled perseverance and pragmatic perspective.

"Through each period of the company's leadership – from my grandfather to my father and from my father to me – there have been different business challenges and social issues to face," says Dr. Thomas Müller who retired from his role as Managing Director in 2019, though he remains Chairman of the Board. Beyond the 32 years he spent at the helm at VS, Dr. Müller literally grew up in the business. His father built their family home on the doorstep of the VS factory in Tauberbischofsheim, Germany, and his childhood was intertwined with factory life.

After graduating high school, young Thomas completed an apprenticeship with a renowned cabinet maker in southern Germany before studying wood and plastics engineering in college. When his father passed in 1987, Dr. Müller left his university position to take charge of the family business and legacy. "What my grandfather, father, and I all had in common was the need to balance our production volume month-over-month. During the last 126 years, the school furnishings industry faced a lot of volatility. So, we each tried to augment our markets in various ways to maintain steady production flows."

Müller's grandfather, Paul Johannes Müller, supplemented the market he faced by selling desks and chairs to families of school children. Though putting work environments in the student's home was a popular idea, home-use desks had to be height adjustable to grow with the child, which made them complex and more expensive. In his time, Müller's father, Falk Müller expanded into making furniture for offices and senior living facilities. When it was his turn to lead the company in the late 1980s, Dr. Müller's vision for leadership began by understanding more about the big picture.

"When I took over VS in 1987, I was strong in wood and plastics engineering. I understood the VS production process and I knew our markets. However, I felt I needed to know a lot more about architecture and design, specifically for education," shares Dr. Müller of his intent to lead the family business into the 21st century. "What I tried to do was give customers, the design community, and the students, some extra benefits in choosing VS furnishings. It's not just the placement of furniture in a school, it's about understanding what teachers and learners need to have the best possible conditions for learning."

Now, as Dr. Müller looks back on the legacy of the company during his tenure, he is proud to celebrate a series of successes including the VS Museum of School Furnishings and *The Classroom*, a compendium of school furnishings and historical influences published internationally in 2010.

Dr. Müller's grandest achievement, however, was his response to changing market conditions.

"Whereas my father and grandfather sought to sell different kinds of furnishings in Germany, I thought the

best thing to do was sell the same kinds of furnishings in foreign markets. This is why we launched VS America in 2003," says Dr. Müller. "This was very difficult. In the beginning, many told me we would never achieve a reasonable market share in the U.S. Now 21 years later, VS America is a successful school furnishings company in The United States. We have also opened markets in Asia, Australia, and the Middle East."

Having grown up in a town where his family's factory employed more than ten percent of the local population, for Dr. Müller VS's legacy is not about selling furniture. It's about understanding the mechanics of the human condition and creating furniture and educational resources that support learner-centric systems.

"A child learns from exposure. The first teacher is the actual teacher. The second teachers are their peers. The third teacher is their environment," he says. "So, our objective is to help create the best possible learning environment. That goes beyond selling furniture. VS and VS America intend to help foster a more unified understanding of design, ergonomics, pedagogy, manufacturing, history, and heritage that combine to influence education."

As he points out, some learning influences arise as innate human nature, and others result from the societal specifics surrounding the child. As time marches on those specifics change, meaning a child-centered education must always be malleable.

"Right now, we are in an age of digitization. This is a time when the world is moving away from pencil, paper, and books to laptops, tablets, phones, and other smart devices," says Dr. Müller. "This suggests we should recalibrate our understanding of the learner's teacher, peers, and environment. We need open learning environments where group formation and movement among groups are natural and frequent. Peers become partners in learning. Perhaps the teacher is more of a moderator of ideas than an authority on instruction who is in complete control of the classroom experience."

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