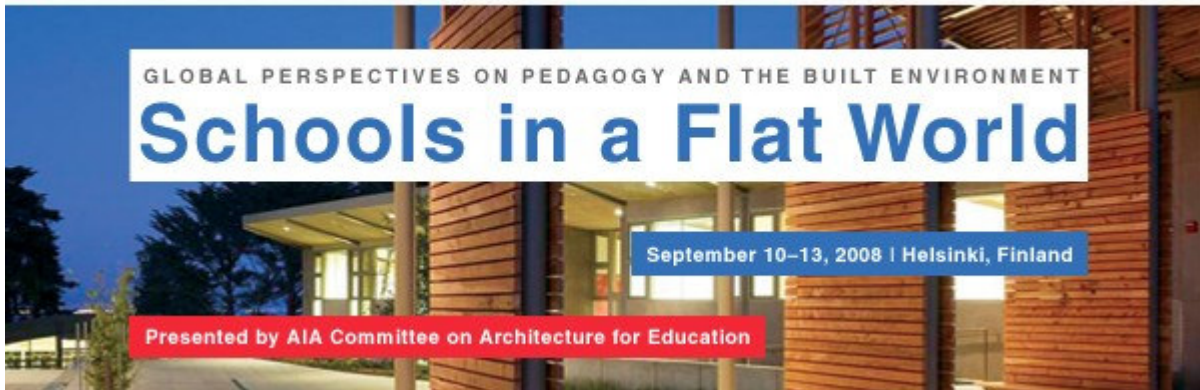


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What a beautiful place to gather: cool, crisp air, a stunning setting, great architecture and a city that offers a blend of the new and the old. It's inspiring — and that's what this conference is all about. Finland has long been a major presence in international architecture circles. From Alvaar Alto to today's new generation of creative Finnish designers, excellence in architectural creativity has its roots in this part of the world. School design continues to be a major part of this history of unique problem solving. (Conference chair, Steve Crane, FAIA)

Our first meeting place was Helsinki's Museum of Contemporary Art Kiasma, a fitting place to launch a global design conference. "Kiasma" is derived from "chiasm," from the Greek word for "crossing." As in the "optic chiasm" in the brain, where our optic nerves partially cross to enable binocular depth perception, the ability to perceive spatial relationships.

For the museum, Kiasma symbolizes its location near the center of a swath of architecturally distinguished cultural buildings that sweeps south from the Finnish National Opera to the Ateneum Art Museum. It also symbolizes this conference, designed to create a crossing point for pathways that originated from points all over the globe.

The Committee on Architecture for Education could not have offered its members this unique opportunity without the collaboration of our colleagues in the Finnish National Board of Education, to whom we say: kiitos. Thank you.

KEYNOTE ADDRESS **IMPLICATIONS OF GLOBALIZATION FOR EDUCATION**

Yong Zhao, University Distinguished Professor of Educational Psychology and Educational Technology and Director of the Center for Teaching and Technology at Michigan State University and Director of the US-China Center for Research on Educational Excellence

Schools — and the people who design them — must come to terms with two new worlds. We have always had to contend with the local, physical world. Now we also have the virtual and global worlds. In May 2006, the avatar Anshe Chung made the cover of Business Week — as the first online personality to amass a net worth in excess of \$1 million (in real money) earned

CONFERENCE PROCEEDINGS

entirely by buying and selling virtual properties. On a website popular in Asia, couples engage in virtual dating, marriage and apartment hunting — as well as virtual arguments about virtual pets. With YouTube, everyone can be a creator. What if your child made an award-winning movie, but failed a math test — would you be happy or not?

On a map of the world where country sizes are proportioned to population, India balloons. On a similar map of wealth distribution, a swollen Europe would loom over a shrunken Africa. On a map of royalty and licensing income, the U.S. would be huge because its economy is based on innovation. Globalization brings all of these things together. What are the implications for education? As Thomas Friedman told his daughters, “Finish your homework; people in India and China are starving for your jobs.”¹ In 2007, an Indian engineer and an American engineer with the same qualifications made \$7,500 and \$45,000 a year respectively².

To compete, Americans must develop “niche talents.” Daniel Pink has described the right-brain thinking needed in the conceptual age³: simultaneous, metaphorical, aesthetic, contextual and synthetic. The essential aptitudes of the conceptual age (design, story, symphony, empathy, play and meaning) cannot be computerized or easily out-sourced. Nor can they be measured by standardized tests. In fact standardized testing may extinguish them.

HELSINKI EDUCATION SYSTEM AND FACILITIES

The Finnish School System

Riita Lampola, Head of International Relations, Finnish National Board of Education

World War II left Finland poor, and its leaders recognized their nation must educate every student as effectively as possible in order to compete. The current national education system dates to 1968, when Finland replaced its parallel school system, which compelled 12-year-olds to choose between two secondary tracks, with a single system for all students through age 16.

An optional pre-primary program for six-year-olds focuses on social training. Compulsory education starts at age seven, when children are deemed ready for academic instruction. Students typically attend nine-year neighborhood comprehensive schools. When they leave, at age 16, students choose between three-year secondary qualifications. Last year 55 percent of the 62,000 students leaving comprehensive schools chose the upper secondary general education program; 38 percent chose the upper secondary vocational program. Recently, more students have been choosing the vocational option, attracted by employment opportunities and salaries in fields such as design, nursing and construction.

The national education system and national curriculum are renewed every decade, most recently in 2004. Since 1985, the trends in these revisions have been to strengthen the roles of local municipalities and schools; to enhance special needs and student welfare services to better support individual learning; and to encourage partnerships between the school and home, between schools and between schools and other local authorities. The foundations of the Finnish

¹ Thomas L. Friedman, “Doing Our Homework,” *New York Times* (June 24, 2004)

² “Tough Choices or Tougher Times,” *New Commission on the Skills of the American Workforce* (2007)

³ Daniel Pink, *A Whole New Mind: Moving From the Information Age to the Conceptual Age*, Riverhead Books (2005)

CONFERENCE PROCEEDINGS

system are a long-term national policy commitment, a broad consensus on education policy and a strong commitment to equal opportunity for all students.

Visions of the Helsinki City School Building Program

Kaisa Nuikkinen, arkkite. SAFA

The Helsinki City Education Department, which has built nearly 50 school buildings or additions since 1994, has had a significant influence on national guidelines for school design. The aims of the city's building program are to develop schools that function more effectively, to answer the demands of the future and to combine the highest quality architecture with economic viability.

The program is based on a conviction that the physical environment affects learning: where we learn, what we learn and how we learn are all interrelated. The school building affects learning indirectly, through its functionality and through its social and psychological environments, which contribute to well-being and thus to learning.

Helsinki City encourages regular evaluation of learning environments. It defines a high quality school as one that is flexible and supports different working styles; acts as a community leisure and culture center; is an inspiring and practical tool for learning; is aesthetically pleasing and fosters psychological and social well-being; follows the principles of sustainable development; is appropriately sized; and enhances physical health and safety.

The department provides questions to help people evaluate their schools, which focus on topics ranging from the interconnectedness of spaces to aesthetics to a parent's sense of welcome. An overarching design question is: what kind of image would you like your school to give of its activities, and how does it affect your identity?

LEARNING FROM FINNISH SCHOOLS

Ulrike Altenmüller, Dr.-Ing. (designata)

Dr. Altenmüller was impressed with the Helsinki City schools on her first visit. Her native Germany imposes a set of very precise rules on school design. When she asked to see its Finnish counterpart, she found it did not exist, that school planners draw upon a set of experience-based recommendations but are free to develop a program for their school. Intrigued by a sense that the Helsinki schools reflect a close dialog between pedagogy and design, she determined to find out how this school architecture developed.

Case studies of three schools, all of them conference tour sites, served to illustrate her methodology. The spatial analysis targeted four parameters: volume and form; circulation and sequence; function and use; and visual communication and transparency. Some of these are interrelated. For example, all of these schools have decentralized circulation; they each have an official entry, but students enter directly into classroom areas that are their homes for most of the day. Because there is less student movement, some of the circulation area can be used for instructional activities. However, to be effective, these supplemental activity areas must be visually connected to the classrooms.

CONFERENCE PROCEEDINGS

Some of the study findings were that Finnish schools are centers for learning and communications for people of all ages within their communities; that grouping classrooms in clusters with independent access to the courtyard and other facilities strengthens the sense of ownership and community within these areas; and that visual connection and transparency allow for a high degree of interconnection between rooms and parts of a school.

The conclusions were that quality schools are possible only when there is an intensive dialog between pedagogues and architects, preferably facilitated by funding authorities; that a combination of recurring functional, spatial and design concepts can have a profoundly positive effect on the learning environment; and that these new paradigms can serve as models for future school design.

UNITED KINGDOM BUILDING SCHOOLS FOR THE FUTURE PROGRAMME

Dr. Valerie Caton, Her Majesty's Ambassador to Finland

Ty Goddard, Director, British Council for School Environments

Mark Walmsley, Director, Turner & Townsend Plc.

David Carter, Executive Principal, John Cabot Academy and Bristol Brunel Academy

Stafford Critchlow, Director, Wilkinson Eyre Architects

The innovative Building Schools for the Future Programme (BSF) brings private and public funding together in partnerships to create new schools. The Blair government's response to the state of school facilities in the United Kingdom, where there were more schools built before 1900 still in use than there were schools built since 1970, BSF is expected to spend eight billion pounds per year over 10 years.

It succeeded the Pathfinder Project, in which local authorities borrowed money from the private sector in a manner resembling a home mortgage, usually to construct single schools. When Pathfinder received a poor National Audit Report in 2003, one result was a shift to bundling school projects to achieve better value. BSF, launched in 2005, introduced a joint venture and strategic partnership approach designed to further improve value for money by establishing long-term partnerships for programs of managed school buildings. The Birmingham BSF program, with 374 school facilities, is the largest to date.

Speaking to the stark difference between the new Bristol Brunel Academy and the surrounding area, one of social deprivation and poverty, its principal says, "It looks like a space ship landed there." The design process focused on improving academic standards and performance, making the school safe and secure, contributing to the regeneration of the East Bristol community and increasing community confidence in the school. He likes it when people say it looks like a university or an office building, rather than a school: an operating theater would not look the same as it did 40 years ago, why should a school?

Before BSF, the government commissioned 12 exemplar school designs, six primary and six secondary. Wilkinson Eyre Architects created one of the secondary designs, a theoretical school for 1,000 students aged 11 to 18. One of the design goals was to create a sense of community within the school. Visits to other schools and consultations with experts convinced the architects that 300 is about the number of people a person can identify with as a community. They divided the educational program into its component parts and created clusters for approximately 300

CONFERENCE PROCEEDINGS

students that are linked by a circulation and gathering space modeled after an agora, an ancient Greek marketplace. Their exemplar design has since been applied in the design of John Madejski Academy in Reading, Bristol Metropolitan College and Hartcliffe Education Campus, also in Bristol.

MIDDLE EAST AND AFRICA

School Design in the Middle East

Sarah Woodhead, Chief of Party, USAID Jordan Schools Project

School authorities in Jordan and Pakistan share several challenges, including rising expectations and an increasing sense of urgency. There is also much to inspire school design in these countries. For one thing, they have more than 3,000 years of architectural heritage. Both modern and ancient buildings offer recurring motifs that reflect both culture and climate: green courtyards filled with drought-resistant plants, cross ventilation, gates of all kinds, shaded arcades and deep, overhanging eaves. However the real inspiration is the students, including the boys photographed as they gathered around an easel blackboard in a dirt field, waiting until their new school is built.

Designers of schools in both countries must pay careful attention to the climate, use local materials and recognize local traditions, including building traditions. Boys and girls attend separate schools, although in Jordan kindergarten boys attend the girls' school. In many communities the school is the largest, most recognizable building and has the potential to play an important role in the community. Schoolyards must be protected; like most homes, they are walled, especially at girls' schools. In Jordan, high school teachers move between classrooms, and the students stay in one room all day; that may be changing, so schools must be designed to support both teacher and student movement.

There are many examples of school design that is sensitive to culture and climate and also supportive of evolving educational programming. The lessons learned are: environmentally sound buildings are not an extra, they are essential; the design context includes a rich design heritage; and the goals are the same, but the strategies may differ.

Levels in Africa

David Young, Young Architects (Pty) Ltd.

In Africa, time runs on multiple tracks. A 2007 photo captures women washing laundry on a riverbank. These villagers operate within their economic capacities. When the opportunity arises, they will educate their children. They will discover efficiencies that will increase productivity and, in time, for better or worse, bring electricity, water and drains. The number of crocodiles on this part of the river will go down; the number of cell phones will go up. Individuals in Africa act rationally, but they are often thwarted — usually by politics, sometimes by nature as well.

Like time, infrastructure in Africa has varying levels. In the continent's wealthiest country, South Africa, people in many communities still collect water at public taps; and there are still schools that are accessible by car only in dry weather.

CONFERENCE PROCEEDINGS

Resources to support the development of schools vary, including the availability of competent architects and builders. There are also issues in the broader community: whether legal and banking systems function as they should and whether there is sufficient security for people to work in peace.

A consistent thread in the development of educational facilities is the absence of detailed architectural input for the great majority of primary and secondary schools. Africa has many schools of architecture, some of long standing. However there has been a disconnect between African architecture and Africa's rich architectural heritage. A Ghanaian architect has observed⁴, "I am an African architect, but I do not see myself in the discipline I have been taught.... I am living in a place with a rich and complex architectural heritage that, sadly, seems to have lost its place in the modern African urban environment."

School design in Africa has been typified more by "sweet words" and "noble statements" than outcomes, either architectural or educational. Translating those aspirations into effective schools is a challenge Africans themselves must face.

AUSTRALIA AND LATIN AMERICA

Overview of Buildings in Latin America

Rodolpho Almeida, architecte, Centro Internacional de Prospective y Altos Estudios

School planners in Latin America are striving to respond to multiple challenges, including some that are familiar to American architects, such as educational innovation and evolving technology, and others that are not. One of the most significant among those is the emergence of the community learning center, which is changing the role of the school and its relationship to the community it serves.

Conceptually, community learning centers are framed by three United Nations Educational, Scientific and Cultural Organization (UNESCO) initiatives: Education for All (basic education as a fundamental human right); Permanent Education (life-long learning); and education that is responsive to the aspirations of the community (economic development).

This impacts the planning and design of schools, which must accommodate the educational needs and interests of adults as well as children. An example is La Bruja Centre for Education for All, in Venezuela. In addition to a nursery, preschool and primary school, it houses a community kitchen, library and resource center, community association space, multipurpose community hall and flexible skills workshops (currently used for instruction in carpentry, tailoring, dressmaking and computers).

The community learning center movement has coincided with a trend toward the decentralization of school planning. The result is that each school is a complex organization. Its programs, services — and design — must consider not only educational and technological innovations, but also the local social, economic and cultural context. It must define new possibilities and find new ways of interacting with the surrounding society.

⁴ Lesley Lokko, "Mud Matters to the African Architect (and Other Minor Mishaps)", *Digest of South African Architecture* (2005-2006)

CONFERENCE PROCEEDINGS

Design, Policy, Culture: The New Normal

Annalise Gehling, Educational Planner, Fielding/Nair International

It is clear that culture influences policy and design, however policy and design can also influence culture. The State of Victoria's Building Futures program illustrates the potential of these interactive relationships.

The design process is shaped by the three interrelated strands of the Victorian Essential Learning Standards: physical, personal and social learning (e.g., civics and citizenship); discipline-based learning (e.g., mathematics); and interdisciplinary learning (e.g., thinking).

These learnings can be linked to learning modalities such as those described in "The Language of School Design: Design Patterns for 21st Century Schools."⁵ Because they identify learner activities, such as collaborative learning and peer tutoring, these modalities are directly applicable to design patterns, such as learning suites and small learning communities.

The key design features of Victoria's "new normal" are personalized learning communities of no more than 150 students; interdisciplinary teaching teams; accessible information and communication technology and print resources; accessible messy-project spaces; undefined, accessible, student-centered project workspace; space for small- and large-group direct instruction; passive supervision; the comfort of having restrooms and personal belongings located within the small learning community; and the comfort of soft seating.

The key cultural features of the new normal are reflected in the creation of an environment that respects both students and teachers, invites students to initiate learning, encourages team planning and teaching and, because small learning communities are largely autonomous, adapts the schedule to learning, rather than fitting learning to the schedule.

CANADIAN ARCTIC AND SOUTHEAST ASIA

School Designs in the Far North

Greg Hasiuk BES, M Architect, MRAIC, MAA, LEED® AP, Number Ten Architectural Group

Approximately 750,000 square miles, half the size of Europe, the territory of Nunavut is home to just 30,000 people; 85 percent of them are Inuit, 60 percent are younger than 25. Average personal income is half the Canadian average, the cost of living 65 percent higher: a package of diapers that costs \$8.40 in southern Canada costs \$21.00 in Nunavut.⁶

Nunavut Premier Paul Okalik⁷ has said, "We have committed to incorporating Inuit knowledge, philosophy, language and culture into government operations and policies, through Inuit *Qaujimaqatunqangit*, or IQ. IQ refers to a way of viewing the world... It involves... social harmony, mutual sharing and assistance, and honesty."

⁵ Prakash Nair and Randall Fielding, *The Language of School Design: Design Patterns for 21st Century Schools*, DesignShare (2005)

⁶ United States dollars.

⁷ In an address at Harvard University on November 13, 2000.

CONFERENCE PROCEEDINGS

The architects who designed Arviat Senior School undertook to help the Inuit keep that commitment. Working in a totally foreign environment, seeking ways to integrate the new school into the community and culture, they found the keys were to collaborate, interpret and investigate.

That approach led the architects to discover the critical element in the 1970s, open-concept school they were replacing: a lecture theater largely surrounded by carpeted risers known locally as “the gray steps.” This modest design gesture had changed the community because it drew upon the Inuit culture of performing arts. The people in Arviat wanted bigger, better gray steps. The result of the collaborative planning was a structure borrowed from another indigenous American people, a centrally located, 2,000-square foot kiva designed to serve as a school and community gathering and performance space, as well as to function as a fully integrated instructional space.

Decentralized Primary School Construction: 500 Schools for Laos

Daniel Schwitter, SKAT – Resource Centre and Consultancies for Development

Laos has a population of 5.5 million people, comprising three main ethnic groups and 47 ethnic minorities. It has one of the lowest per capita incomes in the world; and 8,000 of its 12,000 villages have never seen a school building. The national government has launched an Access to Five program to provide access to basic education for all minority groups and for girls by 2015. One of its key components is education infrastructure.

The goal is to build 200 schools per year. Because there is so much demand, the government has established selection criteria. To qualify for a school, a village must be without road access and populated by an ethnic minority. It must have at least 100 children aged five to 12 years, half of them girls; two trained teachers; and land to donate for the school.

The government plans to build 1,800 classrooms to house 75,000 students, as well as 52 district education offices. Conceptually, the architectural response is to create modular designs and offer villagers three different standards of finishing. The minimum standard provides a clean and dry floor, a solid structural system, a durable roof, a ceiling and furniture. The medium standard adds bamboo or wooden walls and lockable doors. Villages that can afford the maximum standard acquire plastered brick walls and window shutters.

The covered area is important because the government wants the school to become the center of village life. It is critical to the aims of the Access to Five program that the villagers come to value the school, because in many ethnic minorities people believe schooling is a waste of time. The government hopes that, if they see immediate benefits to themselves and the community, parents will be more likely to send their children to the school.

HIGHER EDUCATION PLANNING IN INDIA: VEDANTA UNIVERSITY

Kevin King, AIA, LEED® AP, Senior Associate, Ayers/Saint/Gross Architects & Planners

Indian businessman Anil Agarwal has launched a building program as large as his ambitions: to create a brand new city to support a brand new university that stems India’s brain drain and changes the way his nation sees higher education. “India currently has high quality

CONFERENCE PROCEEDINGS

institutions... which are comparable with the world's best, but these are focused on single disciplines... there is an urgent need for universities providing quality education through a multidisciplinary curriculum, along with a clear research focus, to further India's potential as an R&D hub."

The planning process began with analyses of Vedanta's mission, to create a world-class, multidisciplinary university in an Indian context; of the rural, riverside site, located within a triangle of government, religious and cultural heritage cities; and of other universities that have spawned towns, industry and commerce.

These analyses of programs, place and precedents established the principles that will guide the development of the township and university of Vedanta: to promote research and technology and to support excellence; to be of its place and time and to be Indian in spirit; to have strong centers and edges, to be defined yet porous; and to be sustainable.

The planning draws upon India's rich and symbolic visual vocabulary. Site plans incorporate shapes found in temples and used in city planning for thousands of years. The campus is centered on two overlapping circles that form an oval, an egg, which in the Hindu religion represents God in three manifestations, as the creator, the preserver and the destroyer.

The plan for the phased development of the township and campus is represented by a bud flowering over time. At the completion of the first phase in 2012, the university is expected to enroll 10,000 students in five disciplines. By the time the third and last phase is completed in 2024, it should serve 100,000 students and be prominent in the fields of engineering, management and medicine. Vedanta University will be well on its way to realizing its founder's vision of fostering India's development as a knowledge economy.

SCHOOLS FOR THE FUTURE

InnoSchool: Innovative Future School Concept

Professor Aija Stafans, D. Sc., Architect

InnoSchool is a Finnish higher-education consortium committed to defining and developing innovations in architecture (InnoArch), education (InnoEdu), playful learning (InnoPlay) and services (InnoServe) in order to create the Future School Concept. They describe their efforts as trans-disciplinary, rather than interdisciplinary, because in their collaboration they seek something that will be greater than its component parts, something transformative.

A critical aspect of this collaboration is that researchers in all components work with the same set of partner schools. The InnoArch goals are to deepen the understanding of the interrelationship between a spatial experience and a meaningful learning process and to develop a collaborative, inquiry-based planning and design process for the future school. InnoArch research efforts include outdoor studies, such as neighborhood environmental studies, as well as indoor studies, such as mapping informal learning episodes in a classroom. InnoArch also acts as a co-developer, conducting student design workshops for example.

The image emerging from these research efforts is that a school is a learning neighborhood. But this is a work in progress; InnoSchool hopes to publish its findings in two to three years.

CONFERENCE PROCEEDINGS

Ergonomics

Dr. Dieter Breithecker, Head – German Federal Institute on the Development of Posture and Exercise

The old idea that movement interferes with learning is — an old idea. Our sensory organs evolved to work together, which means we learn best when several senses are stimulated at once. Movement does that, as well as improving blood flow; so movement enhances concentration.

When we are seated, our sensory system is asleep. Adults can sit for 30 minutes before they need to be physically active; adolescents last 15 minutes, young children five. This is why kids fidget in their seats and rock in their chairs; they are trying to wake up their sensory systems. They are doing what is good for their body and mind and soul.

It is important that schools and furniture are designed to support students' needs for sensory stimulation and movement. Ergonomics is not in itself the solution, but it is a critical component of the solution, especially today when students spend more time seated and less time being active.

Classroom of the Future

Dr. Axel Haberer, Marketing Manager, VS International

A black-and-white 1910 photograph holds keys to the classroom of the future: flexibility and multiple use. The classroom is a drawing studio, the furnishings early VS designs. The room had chairs rather than fixed benches, and the tables converted to additional seating, doubling seating capacity to create a lecture hall. Today this room would be called a multifunctional media lab.

Educators all over the world face one basic problem: how to implement new models of teaching and learning in classrooms that are too small. Classrooms in new schools may be designed to support multiple learning activities and project-based learning, but other schools are struggling to help students develop the competencies they will need for the 21st century workplace in very limited spaces. One way to solve this problem is to make these spaces as flexible as possible. Furnishings can expand classroom functionality by enabling the rearrangement of furniture for different learning activities, the conversion of the classroom to different instructional purposes and the integration of technology.

CONFERENCE SUMMARY

Dr. Kaj Noschis, Faculty for Natural, Built and Architectural Environment, Federal Institute of Technology Lausanne (Switzerland)

You may hear Dr. Noschis' closing remarks at [\[link to audio\]](#).

TOUR SITES (ARCHITECTS)

- ❖ Arabia Comprehensive School (Vesa Peltonen, Kaj Warttinen, Evata Finland)
- ❖ Aurinkolahti Comprehensive School (Jeskanen-Repo-Teränne with Leena Yli-Lonttinen)

CONFERENCE PROCEEDINGS

- ❖ Hiidenkivi Comprehensive School (Seppo Häkli, Arkkitehtitoimisto Häkli Ky)
- ❖ Hösmärinpuisto School and Day Care Centre (Yrjö Suonto)
- ❖ Metsola Primary School (Arkkitehtitoimisto B. & P. Manner)
- ❖ Ruusutorppa School (Arkkitehtitoimisto Tilatakomo Oy)
- ❖ AV Media, Helsinki College of Technology (Pentti Kareoja, ARK-house Arkkitehdit Oy)
- ❖ Pukinmäki Comprehensive School (Arkkitehtitoimisto Kuovo Kuovo & Partanen)

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