21st Century Learning Environments, everyone’s talking about it… but what is it really?
THE AMERICAN INSTITUTE OF ARCHITECTS
Committee on Architecture for Education

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150+ Educational & Corporate Projects

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This webinar will demonstrate how 21st Century Learning is taking place through case studies of new creative and invigorating learn work environments. These case studies are not hypothetical unachievable futuristic ideals, but rather recently designed and implemented environments that will transform how today’s leader’s work and how tomorrow’s leaders will learn.

Learning Objectives

Attendees will learn:
1. How a K12 school and a college can transform an office building
2. How to renovate outdate facilities into state-of-the-art technology driven environments
3. How professionals want to work
4. How companies can attract and keep top talent
5. Why design really does matter and how it can improve your bottom line.
Accessing Audio and Handout

For audio, please listen through your computer or refer to your registration confirmation to listen by phone.

The handout of this presentation is located on the CAE website at: www.aia.org/cae on the webinar resources page
The continuing education survey link will be:

Posted in the GoToWebinar “questions” box at the end of this webinar.

Shown in the final slides of this webinar, and emailed to attendees 60 minutes following the webinar.

All attendees at your site will submit for credit by completing the webinar survey and report form. Tuesday, December 2 at 11:59 pm Eastern.
THE AMERICAN INSTITUTE OF ARCHITECTS
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Panelists

Kate Mraw, CID  
K12 Environments

Dan Rentsch, RA  
Higher Education Environments

Natalie Zweig, IIDA  
Corporate Environments

Dr. Lennie Scott-Webber  
Educational Environments
Panelist  Dr. Lennie Scott-Webber  
Steelcase Education  
Director of Educational Environments  

Research Informs Design  
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discovery | brain science

Cognitive neuroscience helps us understand how the brain learns.
cognitive neuroscience is making discoveries daily about how the brain learns

dr. terry sejnowski / salk institute
ANFA
every brain is unique; we each process information in different ways
a human-centered / design thinking research protocol is used

UNDERSTAND | OBSERVER | SYNTHESIZE | REALIZE | PROTOTYPE | MEASURE

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‘PLANET A’ DIFFERENCES - PEDAGOGY

ELEMENTARY / MIDDLE / SECONDARY

PEDAGOGY – CHILD LEARNING THEORIES
BRAIN SCIENCE – MULTIPLE PHYSIOLOGICAL & DEVELOPMENTAL CHANGES; CIRCADIA RHYTHM EFFECTS; AGE COHORT 5 TO 11/12
ELEMENTARY SCHOOLS WITH TEACHER OWNED SPACES ALL DAY
EDUCATORS CERTIFIED IN EDUCATION THEORY AND PRACTICES
CHILD ERGONOMICS; DIFFERENT FUNDING MODEL / MANAGEMENT MODEL;
CONTENT DELIVERY

PEDAGOGY – CHILD LEARNING THEORIES
BRAIN SCIENCE – MULTIPLE PHYSIOLOGICAL & DEVELOPMENTAL CHANGES; CIRCADIA RHYTHM EFFECTS; AGE COHORT 12 TO 15
MIDDLE SCHOOLS WITH VARIATION IN OWNED / SCHEDULED PLACES; EDUCATORS MAY BE CERTIFIED IN EDUCATION THEORY AND PRACTICES
VARIABLE BETWEEN CHILD AND ‘ADULT’ ERGONOMICS;
DIFFERENT FUNDING MODEL / MANAGEMENT MODEL;
CONTENT DELIVERY METHODS

PEDAGOGY – CHILD LEARNING THEORIES
BRAIN SCIENCE – MULTIPLE DEVELOPMENTAL AND HORMONAL CHANGES; CIRCADIA RHYTHM EFFECTS; AGE COHORT 16 TO 18
HIGH SCHOOLS WITH SCHEDULED PLACES FOR SPECIFIC DISCIPLINES; MORE CONTENT SPECIFIC EDUCATORS; MAY HAVE EDUCATION THEORY AND PRACTICES
MORE ADULT-LIK ERGONOMICS; DIFFERENT FUNDING MODEL / MANAGEMENT MODEL; CONTENT DELIVERY MODELS

FORMAL LEARNING PLACES

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A comprehensive overview of formal learning places categorizes them into different levels: K-5, 6-8, 9-12, CC – 2YR, and HE - 4YR. Key differences are highlighted across levels as follows:

- **K-5**
  - Education focused on foundational learning.

- **6-8**
  - Continuation of foundational education with increased complexity.

- **9-12**
  - Secondary education with more specialized subjects.

- **CC – 2YR**
  - Community colleges offering 2-year programs.

- **HE - 4YR**
  - Higher education, typically 4-year programs.

Each level is further differentiated by the nature of learning, including adult learning theories, brain science, funding models, management models, and typical student demographics. The diagram categorizes elements like adult learning theories, content experts, and funding models specifically for each level.

**Key Points**:
- **Andragogy** – adult learning theories are emphasized across each level.
- **Brain Science** – direct transfer from high school to higher education.
- **Content Experts** – focus on content-driven learning.
- **Funding Models** – vary from business-driven to content-driven.
- **Management Models** – range from organized permanent staff to mostly adjunct faculty.
- **Demographics** – age cohorts vary, from 18 to 24 and beyond.
‘PLANET A’ DIFFERENCES - PEDAGOGY

ELEMENTARY / MIDDLE / SECONDARY

PEDAGOGY – CHILD LEARNING THEORIES
BRAIN SCIENCE – MULTIPLE PHYSIOLOGICAL & DEVELOPMENTAL CHANGES; CIRCADIA RHYTHM EFFECTS; AGE COHORT 5 TO 11/12
ELEMENTARY SCHOOLS WITH TEACHER OWNED SPACES ALL DAY
EDUCATORS CERTIFIED IN EDUCATION THEORY AND PRACTICES
CHILD ERGONOMICS; DIFFERENT FUNDING MODEL / MANAGEMENT MODEL; CONTENT DELIVERY

PEDAGOGY – CHILD LEARNING THEORIES
BRAIN SCIENCE – MULTIPLE PHYSIOLOGICAL & DEVELOPMENTAL CHANGES; CIRCADIA RHYTHM EFFECTS; AGE COHORT 12 TO 15
MIDDLE SCHOOLS WITH VARIATION IN OWNED / SCHEDULED PLACES; EDUCATORS MAY BE CERTIFIED IN EDUCATION THEORY AND PRACTICES
VARIABLE BETWEEN CHILD AND ‘ADULT’ ERGONOMICS; DIFFERENT FUNDING MODEL / MANAGEMENT MODEL; CONTENT DELIVERY METHODS

PEDAGOGY – CHILD LEARNING THEORIES
BRAIN SCIENCE – MULTIPLE PHYSIOLOGICAL & HORMONAL CHANGES; CIRCADIA RHYTHM EFFECTS; AGE COHORT 16 TO 18
HIGH SCHOOLS WITH SCHEDULED PLACES FOR SPECIFIC DISCIPLINES; MORE CONTENT SPECIFIC EDUCATORS; MAY HAVE EDUCATION THEORY AND PRACTICES
MORE ADULT-LIK ERGONOMICS; DIFFERENT FUNDING MODEL / MANAGEMENT MODEL; CONTENT DELIVERY MODELS

‘PLANET B’ DIFFERENCES - ANDRAGOGY

POST-SECONDARY / CORPORATE

ANDRAGOGY – ADULT LEARNING THEORIES
BRAIN SCIENCE – REASONING CAPABILITIES;
AGE COHORT 24+
CAREER FOCUSED; TRAINING MODULES FOR CAREER GROWTH; FOCUSED DISCIPLINES; CONTENT ‘TRAINERS’; JUST-IN-TIME, OR TIME ON TASK;
TYPICAL NON-RESIDENT TO SITE / LEARNING CENTER; RESIDENT FOR THE TIMEFRAME; ADULT ERGONOMICS; FUNDING MODEL IS BUSINESS DRIVEN; POTENTIAL EDUCATION THEORY; CONTENT EXPERTS;
SCHEDULED PLACES

ANDRAGOGY – ADULT LEARNING THEORIES
BRAIN SCIENCE – DIRECT TRANSFER FROM HIGH SCHOOL FRONTAL LOBE OPEN; ‘MATURE STUDENTS’ REASONING IS CAPABLE; LIFE EXPERIENCE SHARED; AGE COHORT 18 TO 24
HIGHER EDUCATION – 4 YEAR
SMALL PRIVATES / LARGE PUBLIC / R#1s
TYPICALLY A RESIDENT CAMPUS; SENSE OF BELONGING IS POSSIBLE; DOMINATE PERMANENT STAFF SOME ADJUNCT FACULTY – CONTENT DRIVEN; MULTIPLE DISCIPLINES; ADULT ERGONOMICS; DIFFERENT FUNDING MODEL / MANAGEMENT MODEL; NO EDUCATION THEORY; CONTENT EXPERTS;
SCHEDULED PLACES

ANDRAGOGY – ADULT LEARNING THEORIES
BRAIN SCIENCE – DIRECT TRANSFER FROM HIGH SCHOOL FRONTAL LOBE OPEN; AGE COHORT 18 TO ???
COMMUNITY COLLEGES; TEACHING 2-YEAR CAREER FOCUSED AND TRANSFER PROGRAMS
TYPICALLY A COMMUTER CAMPUS; SENSE OF BELONGING IS CHALLENGED;
SOME PERMANENT STAFF AND MOSTLY ADJUNCT FACULTY – CONTENT DRIVEN; MULTIPLE DISCIPLINES; ADULT ERGONOMICS; DIFFERENT FUNDING MODEL / MANAGEMENT MODEL; CONTENT EXPERTS;
SCHEDULED PLACES

FORMAL LEARNING PLACES / POV - ACTIVE LEARNING WORKS IN ALL

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learning research has provided a theory explaining how to support how we learn.
environment behavior psychology research helps us make sense of situational needs

PROXEMIC ZONES

Intimate
Personal
Social
Public
we offer a ‘rhythm of learning framework’ to address multiple learning needs intentionally
we offer a ‘rhythm of learning framework’ to address multiple learning needs intentionally
we offer a ‘rhythm of learning framework’ to address multiple learning needs intentionally

discovery | human-centered / design thinking

MID-LEVEL ENERGY; SOCIAL CONNECTIONS; PALETTE REFLECTS ENERGY – MID-LEVEL CHROMA/COOL HUES; MULTIPLE TYPES OF POSTURAL CHOICES; CONNECTION TO NATURAL LIGHT; POWER; INTERCONNECTIVITY

MID-LEVEL ENERGY; SOCIAL CONNECTIONS; PALETTE REFLECTS ENERGY – MID-LEVEL CHROMA/WARM HUES; MULTIPLE TYPES OF POSTURAL CHOICES; CONNECTION TO NATURAL LIGHT; POWER; INTERCONNECTIVITY; RECONFIGURABLE FOR SIMULTANEOUS MULTI-MODAL PEDAGOIES/WORK

QUIET ENERGY; SOLO; PALETTE REFLECTS PSYCHOLOGICAL ENERGY – HIGH CHROMA/COOL HUES; MULTIPLE TYPES OF POSTURAL CHOICES; CONNECTION TO NATURAL LIGHT; POWER; INTERCONNECTIVITY; LONG-TERM TASK SUPPORT

PUBLIC

Groups - Small + Large
Ad Hoc
Open
Auditory Privacy
Respite
Generative
Evaluative

Individual
Sem-closed or Closed
Visual + Auditory Privacy
Generative
Respite
Seclusion
Relax + Task

TOGETHER

Groups - Small + Large
Ad Hoc
Open
Collaborative
Generative
Little Visual or Auditory Control

Groups - Small + Large
Scheduled
Closed
Collaborative
Informative
Generative
Evaluative

PRIVATE

HIGHER ENERGY; SOCIAL CONNECTIONS; PALETTE REFLECTS PSYCHOLOGICAL ENERGY – HIGH CHROMA/WARM HUES; MULTIPLE TYPES OF POSTURAL CHOICES; CONNECTION TO NATURAL LIGHT; POWER; INTERCONNECTIVITY

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realize insights and design principles through ideation

capture and distribute information

coop-creation of digital content

visual privacy for teams

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tools to display and share information

share analog and digital content
realize insights and design principles through ideation

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share screens and work surfaces

eliminate barriers

support social learning

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realize insights and design principles through ideation

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reduce barriers and increase accessibility

shared work surface and screens for teaching
realize insights and design principles through ideation
realize insights and design principles through ideation

discovery | human-centered / design thinking research

- coffee as a grand attractor
- brain storming area
- multiple seating options
realize insights and design principles through ideation

discovery | human-centered / design thinking

comfortable seating
acoustical and visual privacy
personal storage

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realize insights and design principles through ideation

discovery | human-centered / design thinking approach

provide for temporary and permanent ownership

standing height work surface

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realize insights and design principles through ideation

discovery | human-centered / design thinking research

paths lead to customer touch points
easily changeable display
children’s brains are highly influenced by their environment
young brains are changing due to technology’s influence – neurons grow quickly daily
we know we have to move to learn and active learning provides deep learning over passive methods
changes by cohort age with differing needs
learning is social and connecting with others is critical
discovery | brain science & learning research

we know we need to focus and support diffuse memory
discovery | learning research

collaboration, connection, negotiation, etc., -- 21st century learning skills are critical
Panelist Kate Mraw, CID, LEED AP BD+C

Associate, LPA Inc.
Programmer & Designer
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100+ Educational Projects

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every brain is unique; we each process information in different ways
the 21st century learners and workers have not changed

...our awareness of how people work and learn best as individuals has changed
I wonder what it's like to be dyslexic
- Sam Barclay

roughly 10% of people have a language-based learning disability, the most common of which is dyslexia.
...a person with an auditory strength means that individual was able to remember approximately 75% of what they hear in a 30-to-40 minute lecture without taking notes...

Less than 15% of the adult population worldwide are auditory learners

-- Susan Rundle, EDL_621 Lecture on Perceptual Elements
...A person doesn't have to be on the autism spectrum to be affected by sensory issues.”

- Dr. Temple Grandin, The Way I See It

Autism now affects 1 in 88 children and 1 in 54 boys.
Sensory Processing Sensitivity (SPS) is an innate trait associated with greater sensitivity, or responsiveness, to environmental and social stimuli.

- Dr. Elaine N. Aron, The Highly Sensitive Person
“Learning style is the way in which each individual learner begins to concentrate on, process, absorb and retain new and difficult material.”

Drs. Rita and Kenneth Dunn and Susan Rundle, Learning Style Preferences & The Building Excellence Survey 1996-2004
**PERCEPTUAL**

- **Auditory (listeners)**
- **Visual Picture (artists)**
- **Visual Word/Text (readers/writers)**
- **Tactile (crafters, builders)**
- **Kinesthetic (movers, athletes, actors)**
- **Verbal (talkers)**
Sound – background noise preference
Temperature – warm/cool
Light – brightness vs. sensitivity
Furniture – formal vs. casual
discovery | diverse preferences

- flexibility
- controllability
- choice
the world actually has changed: from information to innovation
how are we preparing the next generation for the conceptual age?

PROJECT-BASED LEARNING (PBL)

CORE SUBJECTS (the 3 R’s)

learning / innovation skills
- critical thinking
- communication
- collaboration
- creativity

information, media, technology skills
- digital and emerging technologies
- media and information literacy

life / career skills
- grit, resilience
- project management
- social / cross-cultural skills
- leadership & responsibility

supported by:
- Standards & Assessments
- Curriculum & instruction
- Professional Development
- Learning Environments

- Partnership for 21st century skills
If we can learn to let go a little, and allow children to take an active role in their education, learning may become more fun and engaging.

We need to change how we traditionally think about school if we truly want to encourage experimentation, creativity, and problem solving.
watering hole

space to come together to exchange ideas + cross pollinate

mountain top

space to celebrate and share your learning, ‘one to many’

sand pit

space to play, prototype and experiment

cave

space to withdraw from noise and be alone with thoughts and reflections

camp fire

Space to share your stories, exchange ideas and build on each others’ ideas

* David Thornburg / CORE education
watering hole

mountain top

sand pit

cave

camp fire

space to come together

space to celebrate

space to experiment

space to reflect

space to share ideas

e3 Civic High School, Downtown San Diego
E3 Civic High is located inside of a public library, offering extensive opportunities for collaboration as both organizations support a mission of lifelong learning and literacy.
space was designed to encourage social interaction

yet every gathering space also has a niche, a cove or a focus room
“my students feel ownership of the room and have their ‘spots’ that they go to when they need to focus”
1 In what ways do occupants leverage various design features on behalf of 21c teaching and learning?

2 To what extent are specific design features related to the occupants’ individual and collective identities as learners and urban citizens?

3 How do various design elements foster a constructive relationship between school occupants and the community?

4 How did the process of educational commissioning contribute to or hinder the pedagogy-environment fit?
discovery | looking forward

we all learn in unique ways

where we learn matters
Panelist Dan Rentsch, Architect

Belzbergarchitects.com
Higher Education Architect

Occidental College Case Study
dan@belzbergarchitects.com
casual seating encourages social learning

Wall of micro-etched glass, laminated for projection

10 embedded video screens / curated by students
casual seating encourages social learning

Wall of micro-etched glass, laminated for projection

10 embedded video screens / curated by students

discovery | The McKinnon Center for Global Affairs

Higher Education
casual seating encourages social learning

10 embedded video screens / curated by students

Wall of micro-etched glass, laminated for projection
inspiring | learning happens everywhere

Typical Circulation

Minimum Required Circulation

Transformed Circulation

Minimum Required Circulation

Added Informal Gathering Space
casual seating encourages social learning

Wall of micro-etched glass, laminated for projection

10 embedded video screens / curated by students

Higher Education
casual seating encourages social learning

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Panelist  Natalie Zweig, Associate IIDA / LEED AP ID+C

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Work/Learn Environments

Interior Strategist 75+ Projects

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Training rooms can be environments where people meet, learn, share ideas and collaborate.
Corporate education should be seen as an investment in the employee which can be utilized for recruitment and retention.

Educational spaces are becoming amenities instead of afterthoughts.

Light, furniture, ergonomics, color and technology must all be considered.
Specialty learning environments encourage specific education.

Flexible furnishings allow multiple configurations.

Multiple projection screens and integrated technology address large and small meetings.

discovery | The PDS Institute
Corporate

- Central Focus
- Easy Access/ Egress
- Outdoor Adjacency
- Flexible Sizing
• Easily Loaded/ Unloaded
• Easily Serviced
• Restroom Location and Quantity
• Guest Services
• Food Service
• Break Out Rooms
• Specialty Learning Environments
Flexible, adjustable spaces
Educational spaces should be perceived as an investment in the staff.
Create spaces that are easy to stage and service.
Break out spaces that are varied in size, structure and technology
Specifically designed spaces and technologies for learning
[ The Operatory]
discovery | The PDS Institute [ Alternative Learning ]

Giving the spaces in between meaning and function
discovery | The PDS Institute [ Alternative Learning ]

A space that teaches
Committee on Architecture for Education

21st Century Learning Environments Reading List


THE AMERICAN INSTITUTE OF ARCHITECTS

Committee on Architecture for Education

21st Century Learning Environments Reading List


21st Century Learning Environments Reading List


Scott-Webber, L., & Temple, J. (2010). Decentralized Teaching and Learning – Intentionally Designing the “box” to work. In the Conference on higher education pedagogy proceedings. Blacksburg, VA, p. 27.

21st Century Learning Environments Reading List


THE AMERICAN INSTITUTE
OF ARCHITECTS
Committee on Architecture for Education
21st Century Learning Environments Reading List


21st Century Learning Environments

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https://www.research.net/s/21stlearning

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Questions? Contact knowledgecommunities@aia.org
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