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Trends in Higher Education

- Collaborative learning spaces

- Fewer lectures - More seminars

- On-line and blended course options

- Case-based/problem-based formats

- Changing functionality of existing spaces

- Team-based rooms for new pedagogies

- Concurrently scheduled rooms - lecture/lab

- New types of student study spaces

- Ability to accommodate increased enrollments

- How we teach - How we learn
Engaging Students: How they learn

The Learning Pyramid

<table>
<thead>
<tr>
<th>Average Retention Rates</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>Lecture</td>
</tr>
<tr>
<td>10%</td>
<td>Reading</td>
</tr>
<tr>
<td>20%</td>
<td>Audio-Visual</td>
</tr>
<tr>
<td>30%</td>
<td>Demonstration</td>
</tr>
<tr>
<td>50%</td>
<td>Group Discussion</td>
</tr>
<tr>
<td>75%</td>
<td>Practice</td>
</tr>
<tr>
<td>90%</td>
<td>Teaching Others</td>
</tr>
</tbody>
</table>

Traditional lectures, although excellent for many purposes, do not convey concepts well because of their passive nature.

~ John Belcher, MIT Physics Faculty; TEAL Project

Active learning spaces offer informal facilitation, peer-to-peer interaction and instruction, multi-platform technology, and application of concepts through activity.

~ Paulien & Associates, Inc.

Team-based discovery and activities sharpen **communication, critical thinking** and **problem solving skills**
Universal Design for Learning

**Give Students:**

- Multiple means of **representation** to give learners various ways of acquiring information and knowledge.
- Multiple means of **expression** to provide learners alternatives for demonstrating what they know.
- Multiple means of **engagement** to tap into learners’ interests, challenge them appropriately, and motivate them to learn.

**Focus on:**

- Instructional Goals
- Methods
- Materials
- Assessments
As Brad Hargreaves, the 24-year-old founder of GXStudios, says, “We integrate access to social networking sites into our own training programs to try and overcome the major problem I see with most corporate training. It is like the world of encyclopedias — dry, dull, and stale. Millennials, like myself and my employees, expect training to be more like the rest of our lives: instant, fun and social.”
Four Modes of Knowledge Work

**Focusing:** Give each student time that is uninterrupted to concentrate and attend specific tasks such as thinking, studying, contemplating, strategizing and processing.

**Collaborating:** Collectively creating content, brainstorming, and giving all perspectives equal consideration.

**Learning:** Building knowledge by doing and by building on what is known. When thinking is made visible to others, learning is accelerated.

**Socializing:** Socialize and work with others to internalize knowledge and make it useful.

*Tacit knowledge is deeply personal, learned by experience and communicated indirectly through metaphor, analogy, mentoring and peer-to-peer interaction.*

*Explicit knowledge is formal, systematic and typically found in manuals, procedures and documents.*

Learning Trends

**Traditional Pedagogy**
- Teacher-centered instruction
- Single sense stimulation
- Single path progression
- Single media
- Isolated work
- Information delivery
- Passive learning
- Factual, knowledge-based
- Literal thinking
- Reactive response
- Isolated, artificial content

**Contemporary Pedagogy**
- Student-centered instruction
- Multi-sensory stimulation
- Multi-path progression
- Multimedia
- Collaborative work
- Student-centered activities
- Active/exploratory
- Information exchange
- Inquiry-based learning
- Proactive/planned action
- Authentic, real-world content

Research suggests that mastery learning, problem based learning (PBL), inquiry learning, hands-on learning, and many other learning practices increase student engagement and performance. But in many classes, teachers are not using these learning strategies.
Active Learning Spaces: Today’s College Student

- Always on, connected to be active, social and visual learners
- Expect full and immediate access to media and information
- Create and consume large amounts of information
- Visual, multi-sensory technology use is constant
- Connect living & learning
- Value the on-grounds, campus experience
- Consumer-oriented but expect everything to be online
- Want to use technology to express creativity
- Want technology for collaboration
- Prefer authentic experiences
- Global thinkers, what to connect globally
- Blend their social and academic lives
- Galvanic Skin Response (GSR) bracelets ($500,000 Gates Foundation funding study at Clemson University to study emotional responses in classrooms)
Social Learning

**Definition:** Learning that is collaborative, immediate, relevant, and presented in the context of an individual’s unique work environment.

John Seely Brown, a consultant and author, tells this story: John King, the associate provost for academic information technology of the University of Michigan, asked Brown a seemingly straightforward question about how many students Brown thought the University of Michigan taught each year. In response, Brown says, “I knew that the university had approximately 40,000 students, give or take a few thousand, so that was my answer.” Though King agreed that Brown had gotten the university enrollment correct, he explained that the number of students touched was much closer to 250,000. Here’s his rationale: “Each year the incoming students bring their social networks with them. These networks reach back into UM student’s communities and schools. Using the social software and social network tools of SMS, IM, Facebook, MySpace, they extend the discussions, debates, bull sessions and study groups that naturally arise on campus to encompass this broader constituency, thus amplifying the effect the university is having across the state.”
The Future of Technology: The Conversation Prism

[Diagram showing various technology platforms and their interconnections]

Brian Solis, Social Media Brandsphere
The Future of Technology: The Conversation Prism

Brian Solis, Social Media Brandsphere
The Future of Technology: The Conversation Prism
On-line/Hybrid/Blended Education

What if the roll of the classroom is diminished and education comes to the student?

![Chart 1 - Annual Growth Rates for Online Enrollments](chart1)

![Chart 2 - Is Online Education Critical to the Long-term Strategy of your Institution?](chart2)

Babson Group & Sloan-C
Flipped Classroom

The Flipped Classroom IS:

A means to INCREASE interaction and personalized contact time between students and teachers.

- An environment where students take responsibility for their own learning.
- A classroom where the teacher is not the "sage on the stage", but the "guide on the side".
- A blending of direct instruction with constructivist learning.
- A classroom where students who are absent due to illness or extra-curricular activities such as athletics or field-trips, don't get left behind.
- A class where content is permanently archived for review or remediation.
- A class where all students are engaged in their learning.
- A place where all students can get a personalized education.
- Supports an institution’s educational goals, program, structure and course content.

The Flipped Classroom is NOT:

- A synonym for online videos. When most people hear about the flipped class all they think about are the videos. It is the interaction and the meaningful learning activities that occur during the face-to-face time that is most important.
- About replacing teachers with videos.
- An online course.
- Students working without structure.
- Students spending the entire class staring at a computer screen.
- Students working in isolation.
Ohio State University: Digital First

- Two-year initiative
- Use **devices** that many **students already have**
  - Laptops
  - Smartphones
  - Tablets
- Flipped classroom
  - Post lectures online before class
  - Not about flipping the “when and where” instruction is delivered
  - About flipping the attention **away** from the **teacher** and **toward** the **learner**
  - Students text and tweet responses during discussions for a more engaging experience
- Results
  - **Increase in attendance**
  - Created a learning environment in which student work can be completed in class
  - Classroom looks more like “**learning centers**” where students are working on different tasks at the same time
  - Classrooms are quite chaotic: **small groups** gather at the corner tables, a **one-on-one** conversation up front, **experiments** at the stations, and yet others **writing in their research journals**
  - Restructured to reflect the value that unstructured and “**unprogrammed**” time has on student learning and well being
  - Provide students with time during class to complete their school work also reflects a respect for students’ time and life outside of school
  - Time in school is now focused on student progress rather than teacher-determined timelines.
  - Used for one-on-one training for faculty members

“This is about education, research, enhancing a mindset and setting our campus up for the future. What we hope we’re providing is a response to a groundswell of students who want this mobile environment and are ready for it.” Michael Hofherr, senior director for learning technology
Educational and Interactive Technologies

INTERACTIVE PLASMA DISPLAYS
These devices permit users to view content, manipulate it, and save it for a future discussion. At any time, the contents on display can be printed or saved to an electronic file.

CONTENT SHARING SYSTEMS
These software / hardware solutions permit multiple users to alter the contents of the display mounted at the front of the classroom.

AUDIENCE RESPONSE SYSTEMS
This tool permits students to answer questions electronically and to have the results compiled immediately.

MULTIPLE DISPLAYS
LCDs or screens with high definition projection throughout the space support multiple fronts of room.
1. There is a growing disconnect between the valuing of arts education and the prioritization of it.

2. The Arts Education delivery system has become increasingly more sophisticated.

3. There are increasing efforts to build coalitions to support sustained, systemic change for arts education.

4. Arts Education is increasingly influenced by federal policy.

5. Arts education professional development has increased in quality but not necessarily in demand.

6. An emphasis on 21st century workforce skills creates an opportunity for arts education.

7. Arts learning and instruction are increasingly influenced by electronic media.

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Americans for the Arts, 2010
A Whole New Mind: Daniel Pink
A Whole New Mind: Daniel Pink

A Whole New Mind Discussion Guide

1. Does your classroom, school or school system promote L- or R-directed thinking? How? What is the proper balance?

2. How innate are the six abilities Pink talks about? Can these abilities be taught or strengthened in school? How?

3. What role does design have in your classroom or school? Do your students play any role in the actual design of their learning experience? Can it be incorporated into the curriculum in areas other than art class? How?

4. Is storytelling part of your curriculum? If not, should it be? How?

5. Can you teach empathy? Should you teach empathy? How?

6. Do you agree with what Pink argues about the importance of play for learning and creating? What can you do to include more play in your teaching and your students' learning?

7. Are your students learning to be symphonic thinkers? If so, how can we teach this capacity? Does the traditional means of organizing teaching by discipline interfere with students' and teachers' ability to think symphonically?

8. What do you think of the Charter High School for Art and Design (CHAD)? How could CHAD be used more broadly as a model for schooling? What are its strengths? Weaknesses?

9. Do you agree with Pink that videogames are important for developing skills like problem solving, visual perception and symphonic thinking?

10. How is Pink's notion of "meaning" a part of your teaching? Should we even broach this subject in a secular classroom? If so, how?

11. Pink talks about psychological androgyny and aligns R-directed thinking with one's feminine side. Do you agree? What do you observe in your own classroom or building?

12. How have your students been impacted by the SAT-ocracy and the culture of standardized testing that Pink describes? How has your teaching been impacted by these tests? Do these tests make it more difficult to have a whole-minded approach to teaching and learning?

13. What do you think of the Rainbow Project, the alternative SAT created by Yale Professor Robert Sternberg?

14. Is your school ready to embrace Pink's theories about R-directed thinking in the Conceptual Age? What about society as a whole? What are the consequences for students and educators if we do not?

15. What R-directed skills do you use in your work? Which of the six senses is a priority for teachers to develop? Why?

16. Which of the portfolio exercises from the book would you recommend for other educators? Which ones would you use with students?

17. How, if at all, should teacher training change in light of these ideas?

18. How do you imagine educators in Asia or other countries might react to the ideas presented in this book?

19. After reading A Whole New Mind, what is one change you would make in your classroom, school or school district? What challenges would you face in implementing this change? How would you plan to overcome these challenges?

20. What in the book made you laugh? What made you angry?

Your own questions:

__________________________________________________________________________

__________________________________________________________________________
1. **Start with what you have.** "We started in a trailer," Kembel points out, "with the 'd.school' as a sign on the table." Kembel's advice: Claim a space and label it.

2. **Go to the people who are interested first.** Form a crack team of true believers to spearhead your campaign. Revolutions start from the bottom up.

3. **Empower your team to change their space.** Somebody high enough up the food chain needs to defend this activity against facilities managers who may not be amused. **Then, be willing to keep changing things.** Try out different ways to configure space to see what works best.

4. **Watch the behavior of the group and take notes.** Have somebody in your band of innovators own this task. What's working, what isn't? "Try, reflect, modify," says Kembel.

5. **Develop group-sized artifacts.** Whaa? In short, forget the spreadsheets with the tiny type. "Get your ideas up in big enough form so that others can see and add to them."

6. **Keep any prototypes, sketches, or idea-jam artifacts low-rez and not precious.** "Don't get too formal too fast," says Kembel. Making things precious locks them in too soon, short-circuiting potential improvements.

7. **Show your work in progress.** "Put your underwear up on the line and let people comment. But keep it safe," Kembel says. No rude comments allowed.

8. **Do something simple to surprise people.** At the d.school, they painted the women's restroom lipstick pink, and hung disco balls. "That makes people realize that somebody cares about your experience," Kembel says.

9. **Invest more in "we" spaces than in "I" spaces.** Cozy nooks for teams, not plush corner offices for the alpha dogs.

10. **Mix up seating options.** Take the table out of the room and sit on the floor. Vary seat heights. Change customary positions at meetings. For example, put the group leader in the middle, instead of at the head of the table. Try holding a meeting where only standing is allowed. In general, work to lower status markers.

11. **Make idea generation and capture easy.** Any non-porous surface can be a whiteboard, says Kembel. Buy a sheet of sheer acrylic at Home Depot and mount it on a wall as a writing space. Keep markers handy. Put prototyping tools out where people can grab them when an idea strikes.

"Creativity follows context," says Kembel. The main idea, he says, is not to segregate creativity from other activities. "You don't need to be fancy to do it," he says.
Space Allocation Process

- Programs and Pedagogy
- Partnerships & Student Demographics
- Academic Support
- Technology and Delivery
- Faculty and Staff

Space Allocation Planning

Classrooms & Academic Commons
Collaborative Learning Areas
Teaching & Open Laboratories
Faculty & Staff Offices
Community Areas
Student Areas
Classrooms: Student-Centered Learning

Present Model
- Specialized
- Formal
- Structured
- Physical
- Individual

Emerging Model
- Multipurpose
- Informal
- Flexible
- Virtual
- Team

S. Dugdale, A Case Study in Master Planning the Learning Landscape
Classrooms: Elkhorn Valley Campus Classrooms
Active Learning Spaces: Large Group

**Group-based Model**

- Over 100 students
- 25 – 30 ASF/Station
- Highly collaborative, hands-on, computer-rich, interactive learning environment for large-enrollment courses (NCSU SCALE UP)
- Instructors move throughout room during lecture as a “guide on the side” with voice amplification
- Learning shifts to the students as educators
- Faculty members introduce a problem and students work in small groups and independently to complete assignment
- Lecture, recitation, and hands-on experiments are in one space
Flat vs. Raked
Active Learning Spaces: Mid-Sized Group

**Team-based Model**
- 25 – 30 students
- 30 – 35 ASF/Station
- Front-of-room and group discussion
- Lightweight and ergonomic furnishings
- Large screen displays
- Whiteboard surfaces
- Sufficient electrical outlets

**Project-based Model**
- 25 – 30 students
- 30 – 35 ASF/Station
- Front-of-room and group discussion
- Lightweight and ergonomic furnishings
- Large screen displays
- Whiteboard surfaces
- Sufficient electrical outlets
- Learn as individuals & as teams
- Small groups are used to master content
- Faculty members introduce a problem and students work in small groups and independently to complete assignment
Active Learning Spaces: Mid-Sized Group
Active Learning Spaces: Breakout Spaces

- Technology supporting front-of-room
- Comfortable seating
- Lightweight ergonomic furnishings
- Multiple vertical surfaces
- Horizontal surfaces
- Balance visibility and transparency
- Sufficient electrical outlets
- Porous work areas
Active Learning Spaces: Breakout Spaces
Active Learning Spaces: Breakout Spaces

What do these small, active learning spaces have in common?

- Small group discussion areas
- Informal gathering spaces
- Equal access to information through technology and sight lines
- Revisited if storage nearby
- Human density of 4-8 people
Flexible Learning Spaces

Multi-Purpose Classroom Space: ALL INSTRUCTIONAL

Multi-Purpose Classroom Spaces: MIXED

Multi-Purpose Space: ALL SOCIAL
Assignable Square Feet/Student Station is a unit of space that is assigned to a single station in a designated space.
Changing student station configurations without changing the number of stations, also yields support of different pedagogies.

Classroom Configurations

- Tablet Armchair:
  - 60 Stations
  - 22 ASF/Station

- Tables & Chairs:
  - 60 Stations
  - 22 ASF/Station

- Active Learning:
  - 60 Stations
  - 22 ASF/Station
Classrooms: Discussion
Trends in Laboratory Design

**Design for Flexibility**
- Design to accommodate change – be generic not specific.
- Consider use of space and selection of lab fit-out (e.g. using furniture which can be reassembled).

**Design for Shared Resources**
- Minimize space and equipment that can only be used by one subject.
- Consider site specific rather than subject specific and consider sharing within discipline.

**Design for Connectivity - Create a Social Building**
- Foster opportunities for both formal and informal interaction.
- Create a sense of community within the building.
- Plan break out/meeting rooms and atrium spaces – places for people to congregate outside of labs to talk with one another.

**Design for Team-Based Discovery**
- Provide space for teams to work together and support information access with IT services.

**Design for Pedagogy**
- Consider coursework and blended education.
- Consider on-line/hybrid/streaming delivery of content vs. on-campus education.
- Consider the flipped model.
Trends in Laboratory Design

Design for Technology

- Consider how equipment, bench space and workstation may need to be integrated.
- Create state of the art conferencing education and presentation centers to provide high level multi-use access to advanced interactive computer systems.

Design for Environmental Sustainability

- Fume Cupboard – use efficient hoods (VAV preferably) & educate users about electricity cost
- HVAC – optimize ventilation rates and design low pressure drop HVAC design
- Electrical – design appropriate plug loads; use lights that have sensors to turn off when lab is unoccupied
- Natural Daylight – bring into labs (where appropriate) for reduced energy use and occupant productivity
- Energy Efficiency – consider natural convection of fresh filtered air
- Maximize Energy Recovery
- Use Renewable Energy Sources - fuel cells, photovoltaic or wind turbines
- Water efficiency - use recycled where appropriate or waterless urinals
## Laboratory Space

<table>
<thead>
<tr>
<th>Discipline</th>
<th>ASF/Student</th>
<th>Service Factor</th>
<th>Total ASF/Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawing</td>
<td>50</td>
<td>30%</td>
<td>65</td>
</tr>
<tr>
<td>Painting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>60</td>
<td>30%</td>
<td>78</td>
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<tr>
<td>Multi-media</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceramics</td>
<td>80</td>
<td>30%</td>
<td>104</td>
</tr>
<tr>
<td>Sculpture</td>
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### Art Labs have unique requirements.
- Depending on the type of medium (drawing, painting, multi-media, ceramics, sculpture) labs can range from 50 ASF/student to 80 ASF/student.
- Plumbing and electrical services do not require structural accommodations.

### Equipment Level Definitions:
- **Low**: Table top equipment or open space for physical activities with very little equipment
- **Medium**: Equipment that does not require structural accommodations
- **High**: Equipment requiring structural accommodations

### Service Factor:
Percentages are relative. So while the service needs may be great, a smaller percentage may be recommended as the space per student may be large, whereas a smaller space per student may require a larger percentage.

### Utility Level Definitions:
- **Low**: Electrical and up to two sinks
- **Medium**: Increased electrical for equipment, gas, compressed air, fume hoods, and room air changes.
- **High**: Systems for bio-hazards, sterile environments, animal washing facilities, dust collection, and fuel or flammable substance handling

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</table>
Laboratory: Discussion
Office Trends

**Traditional Office**
- Single resident in closed room
- Goal of large, corner office
- Privacy
- Pictures and plants
- Designated seating
- Designated file storage
- Hard wired to internet

**Shared Office**
- Dual residents in closed room
- Private office is goal
- Some privacy
- Pictures and plants
- Designated/shared seating
- Designated file storage
- Hard wired to internet
Office Trends

**Adjunct Offices**
- Shared offices
- Separate room for private conversation
- Shared workroom equipment
- Visitor seating
- Shared file storage
- Hard-wired / wireless connectivity

**Office Design Trends**
- Shared collaborative and team-oriented space
- Smaller but smarter
- “Hotelining” within private enclaves
- Privacy rooms for ad-hoc conversations
- Electronic personal items: wallpaper & savers
- Informal seating
- Culture parks
- Ubiquitous electronic storage
- Wireless connectivity
Office: Discussion
Student life has transitioned from traditional social and recreational activities to the inclusion of academic nodes.
Student Life
Student Life
A Porous Educational Environment

Quiet
- Quiet Individual Study Rooms
- Open Plan Computer Desks
- Social Learning, Informal Meeting
- Food Service, Lounge, Tables & Chairs

Quiet Reading Space
- Books, Reference Materials, Journals, Magazines, CDs of Flipped Content
- Social Learning, Informal Meeting

Computer Desks and Specialized Software
- Elevators
- Stairs

Small Presentation Rooms
- Entry, Help Desk, Security, Copying & Printing, Materials Issue and Return

Noisy
- Community
- Staff Spaces, Private Meeting Rooms
- Large Space for Presentations, Theater

Definitely Not To Scale
Thank You