

Arts

in Education


Dr. Jeff Sapp
TED 402

Agenda

- How Do Arts Affect Our Brain?
- What is the Significance?
- What Policy and Practices are Suggested?
- Conclusions



WARNING!

Many of the same people that are perfectly comfortable with kids accessing computers in the classroom seem terrified of arts as a discipline. But the actual peer-reviewed, scientific evidence lends **strong support** to the arts in broad areas.




Goal

Deepen our understanding about the effects of arts on our brain and student's lives.





1. Can Arts Create Dramatic and Positive Changes in Our Student?
2. If So, How Can We Foster It?

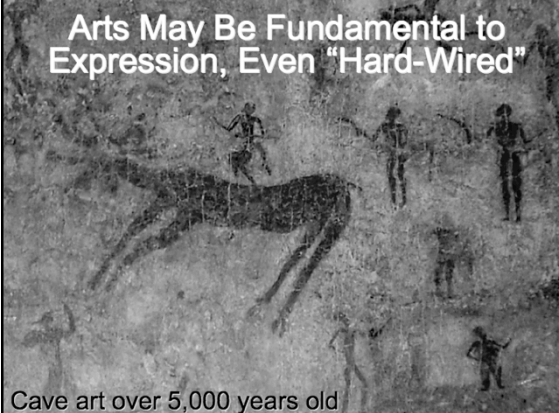
Defining the Arts:
The Definitions are Broad!



Arts are Defined by:
The process or product of cultural, emotional, physical, spiritual or cognitive expression.




Arts May Be Fundamental to Expression, Even "Hard-Wired"




Cave art over 5,000 years old

"Bart... how's that right brain arts class coming along?"



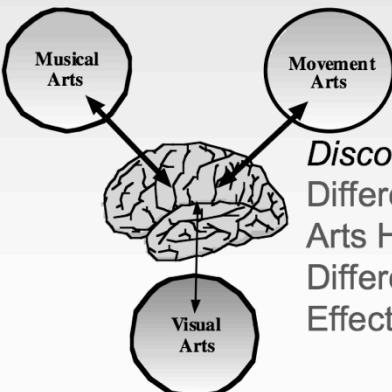
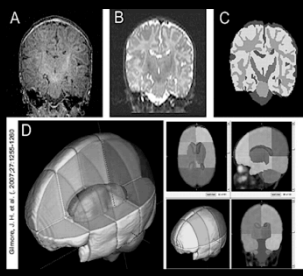
Example of Out-of-Date Thinking About Arts



Is Music in Particular (or Arts in General) Largely a *Right Brained* Experience?

All of the data we have suggests that the arts are processed differently from one person to the next, from novices to professionals. But what has become very clear is that *most of our brain is involved in the arts.*

Absolutely NOT



Discovery: Different Arts Have Different Effects

How Specifically Do Arts Change the Brain?

1. Strengthen specific "key academic" areas (attentional system, fine motor, etc.)
2. Develop transferable life skills (EQ, deferred gratification, diversity, creativity, etc.)
3. Enhance ability to manage emotional states (patience, flow, self-discipline, etc.)
4. Provide expertise and self-confidence

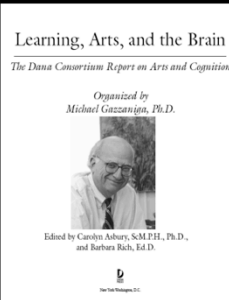
Good News!

Arts are now part of on-going scientific investigations. The data is strong and exciting.



Arts and Academics

Dr. Catterall at UCLA School of Education analyzed the records of 25,000 students progressing from 8th-10th grade. Those who studied arts had **higher grades**, **scored better** on standardized tests, had **better attendance** records and were **more active** in the community. (Fisk, 1999)



Powerful New Report Based on Studies by Top Neuroscientists Suggests Arts are Significantly Correlated with Cognitive Skills

- Overall effects are positive
- Effects are often indirect
- Different arts have different effects
- Different ages have different effects

Conclusions from the Latest Report



SOURCE: "How Arts Training Influences Cognition" in "Learning, Arts, and the Brain: The Dana Consortium Report on Arts and Cognition" Organized by: Gazzaniga, M., Edited by Asbury, C. and Rich, B. Published by Dana Press, New York/Washington, D.C. web access: www.dana.org

A New View of the Human Brain

The human brain is dynamic, not fixed.

The brain (depending on your age) is:

- making connections
- adding new neurons
- pruning excess neurons
- allowing neurons to die
- changing its chemistry
- re-organizing itself every single day!



When Done Well, Why are the Arts So Positive and Powerful?

The secret is a metaphor that ties together the brain and technology...

Every computer has an "operating system." That serves as a platform for everything else.



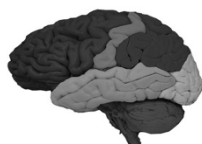
What is an "Operating System?"

It is an integrated collection of subsystems that each contribute to a larger task. For example, better attention skills generally support better learning. But by itself, attention alone will not make one a strong learner.

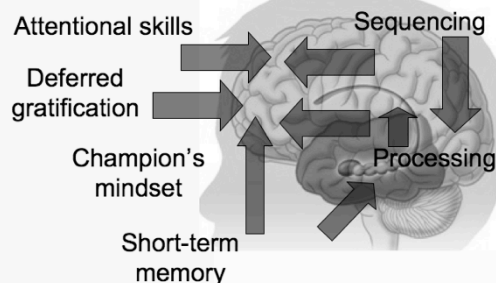


Your Operating System Features

1. We are born with rough systems; they have to be developed
2. Each person's system is unique
3. They're a product of nature & nurture
4. The value is highly contextual
5. The systems all work at varying levels; they are not either "on or off"
6. Every system can be built and improved

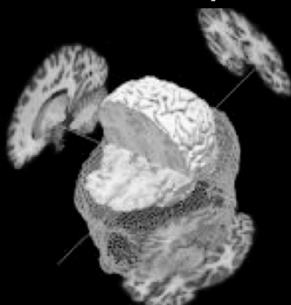


Academic Operating System



Operating Systems Overlap

Some of the same sub-skills that support an academic process such as reading can be useful for social skills. They include paying attention, listening skills, short-term memory and deferred gratification.



The Academic Success Operating System "C-H-A-M-P-S"



How to Build Operating Systems

- Arts (dance, music, theater, etc.)
- Physical activity/Sports
- Apprentice programs
- On-the-job training
- Martial arts
- Simulations/Games
- Daily routines
- Tutoring
- Video programs

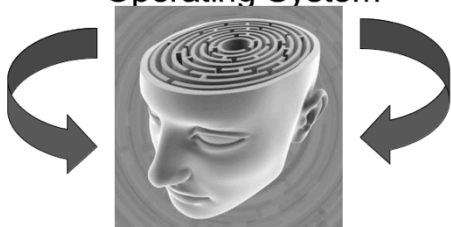


Arts Support the Following Operating Systems:

- ✓ Memory
- ✓ Processing
- ✓ Attention
- ✓ Optimism/hope
- ✓ Task Sequencing
- ✓ Self-confidence



Arts Develop the Brain's "Operating System"



Then the "Operating System" Drives Learning and Behavior

Let's look at these forms of art:

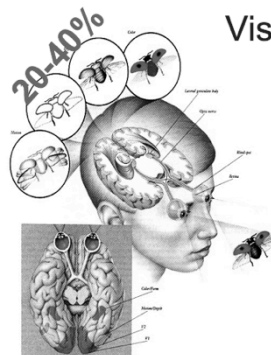
- Visual Arts
- Musical Arts
- Kinesthetic Arts

Visual Arts Include

Cartooning, Drawing, Painting, Coloring, Storyboarding, Photography, Lithography, Printing, Costumes, Make-up, Lighting, Staging, Multimedia, DVD, Mapping, PowerPoint, Illustrating, Graphic Design, Movies, Graphic Organizers, Web Pages



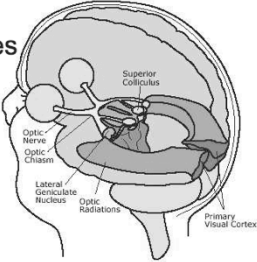
Visual Processing



Best evidence suggests that our brain devotes an extraordinary amount of space and computational power to vision. Most estimates are in the **20-40%** range.


Visual Processing is **MUCH** More Than Simply Seeing

- ✓ Seeing
- ✓ Retrieving images
- ✓ Hallucinating
- ✓ Visualizing
- ✓ Altering images
- ✓ Dreaming
- ✓ Analyzing




What Attracts the Visual Brain? We Respond to These...

1. **Movement** in context
2. **Contrast** (e.g. use of SIZE, shadow, color, etc.)
3. **Form** (certain ones are “hard-wired, familiar ones recalled best)
4. **Novelty** (temporary attention-getter)



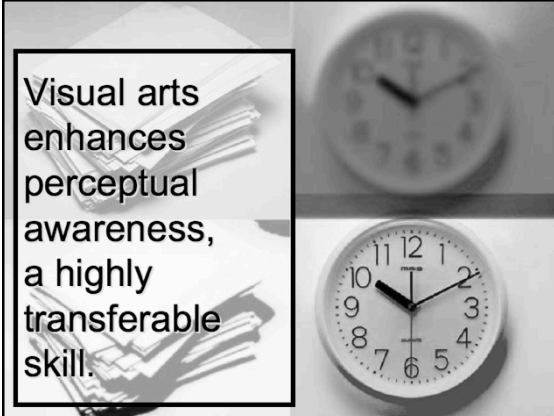
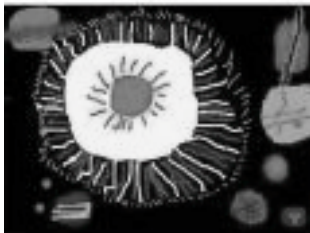
Visual Arts Support Processing Skills



Vogt S, Mangunwanti S. (2015) Hemispheric specialization and memory for associative visual stimuli. *PLoS One*, 10(8):e0132433. doi:10.1371/journal.pone.0132433

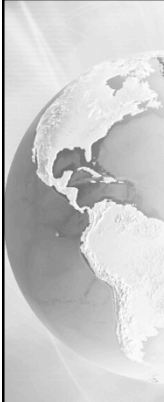
Zohary E, Hochstein T, Kaplan A, Hochstein E, Hochstein L, Engel SA. (2011) Visual search: A comparison of human and monkey performance. *Journal of Vision*, 11(12):1-11. doi:10.1167/11.12.1

Visual arts enhances perceptual awareness, a highly transferable skill.

Visual Arts

“When we do art, we get to create, make and do what **we want to see**. When we do math or science, we only get to do what **someone else** wants us to see.” *Student, age 10*




Creativity

In an academic world which is becoming increasingly STANDARDIZED, arts fosters creativity.

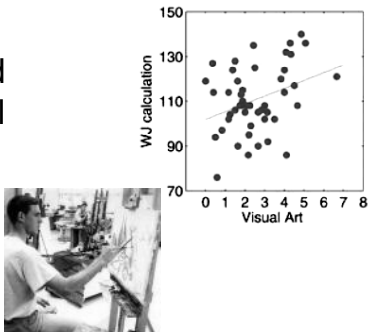
In a world full of problems, the solutions will need to be very creative for the human race to survive.

Evidence for Value of Visual Arts

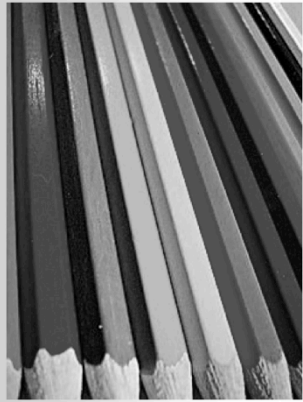


- Improves thinking skills (Jing, Yuan & Liu, 1999)
- Improves writing skills (Levin and Bus, 2003)
- Develops creativity (Kokotovich and Purcell, 2000)
- Enhances problem solving (Gardiner, 1996)

Hours Invested in Visual Arts Boosts Math Scores



Spelke, E. (2008) Effects of Music Instruction on Developing Cognitive Systems, at the Foundations of Mathematics and Science. *Fig. 17-50 in "How Arts Training Influences Cognition" in "Learning, Arts, and the Brain: The Dana Consortium Report on Arts and Cognition" Organized by Gazzaniga, M., Edited by Abbury, C. and Rich, B. Published by Dana Press, New York/Washington, D.C. web access: www.dana.org




Visual Arts

Teach us to

- 1) see things differently
- 2) take another's point of view
- 3) encourage dialogue
- 4) acknowledge another's point of view and
- 5) honor diversity of thought and culture.

Transitioning from "Old School" Visual Arts to the New Media



Opportunities for Media Arts




- ✓ Far more opportunities (e.g. multiple media sources!)
- ✓ Very engaging hands-on
- ✓ Electronic prices will continue to lower
- ✓ Kids already use the media

New Media Means Change

With every new technology, you have to change your teaching practices or it won't work for your students.

Sorry, Television Does NOT Qualify as Doing Visual Arts




While you watch TV

- Travel to new places
- Read challenging things
- Have interesting friends
- Solve tough problems
- Limit TV time

While you solve simple calculations quickly

- Take on big projects
- Share what you learn

How to Maximize the Potential for Using Visual Arts




- Visual arts for all students
- Consistent daily application 3-5x/wk.
- Visual arts integrated across the curriculum
- Teach students *how to use* visual arts; never assume they either have “an arts gift” or not.

Musical Arts Include

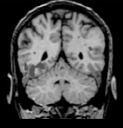


Reading or Playing Music
Singing, Rapping or Producing
Composing, Arranging or Conducting
Analyzing or Critiquing
Producing or Participating in Musicals


Musical Arts Build Attention Span and Capacity for Deferred Gratification Which Supports Achievement



Music is processed in many parts of the brain




Harmony and rhythm are processed on the left side of the brain.

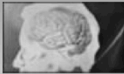


Greater musical complexity including intonations are processed in the right hemisphere

Playing Music Adds Brain Mass to the Sensory-Motor Cortex




Evidence for Music

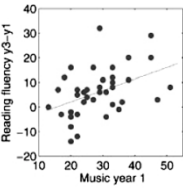



- Connectivity and Coherence (Shaw, 2000)
- Spatial Reasoning (Rauscher et al. 1997)
- Immune System (McCarty, et al. 1996)
- Perceptual-Motor Skills (Palmer, 1997)
- Verbal Memory Improvement (Chan et al. 1998)

Music training enhances mental sequencing and organizing which is a highly transferable skill.




Hours Invested in Music Training and Reading Fluency Scores

Spelke, E. (2008) Effects of Music Instruction on Developing Cognitive Systems, at the Foundations of Mathematics and Science. Pgs. 17-50 in "How Arts Training Influences Cognition" in "Learning, Arts, and the Brain: The Dana Consortium Report on Arts and Cognition", Organized by Gazzaniga, M., Edited by Asbury, C. and Rich, B. Published by Dana Press, New York/Washington, D.C. web access: www.dana.org

Music Training Aids Listening




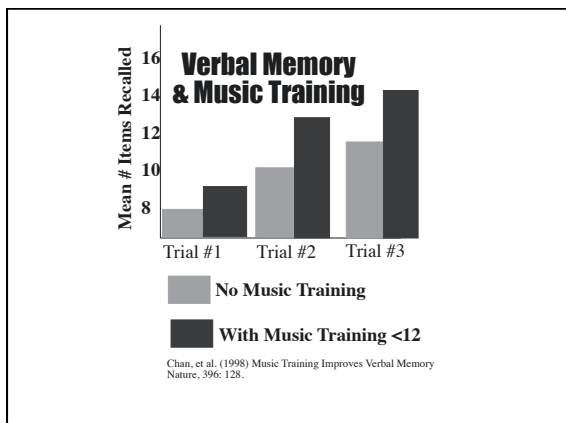
Music training enhances auditory awareness which is a highly transferable skill.



Word Memory

Highly valued for reading, writing, social studies, vocabulary building and overall communication skills. Short-term memory and vocabulary skills are highly correlated with improved intelligence and academic results.





Many Potential Roles for Music

- Socialization
- Change body language
- Trigger memory
- Enhance movement
- Priming for learning
- Stir emotions
- Calm and relax

1 Music Can Influence Brain Chemistry 3

- High "reward", or positive memory music activates the pleasure system and releases dopamine

- Familiar, favorite music activates the "comfort" chemical serotonin

High BPM or stressful music activates the stress system which releases cortisol and norepinephrine

2

Music as a Tool of Engagement


- Students can be in charge of class music as long as they have your boundaries for it.
- Higher beats per minute increases good stress and energy levels.
- Familiar pop songs can spur memories of being active and having fun.

How to Maximize Potential of Musical Arts

- Music required for all K-5 students
- Exposure to all children; never assume a child does or does not have a "gift"
- Consistent application @ 30 min. 3-5x/wk.
- Music integrated across the curriculum
- For grades 6-12, music choices

Kinesthetic Arts Include

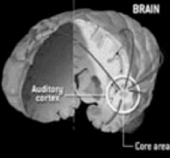
- Dramatic (drama, theater, role-play, musicals)
- Recreational (sports, recess, games, etc.)
- Industrial (sculpting, design, repair, building)



Drama and Theater Arts

“There is a vitality, a life force, an energy that is translated through you into action... and if you block it... *it will be lost forever.*”


Martha Graham



How Theater Art Changes the Brain

- Improves cognition (Noice et al. 2004)
- Builds emotional intelligence, builds complex thinking (Berthoz, 2000)
- Enhances sense of timing (Shaw, 2000)
- Improves emotional decoding skills (Boone & Cunningham, 1998)

Many educators are unaware that early physical activity supports later academic activity




Do these skills sound useful?



- spatial awareness
- extended practice
- self-confidence
- judgment
- sequencing
- visual discrimination

Dramatic Arts Enhance


- ✓ Verbal memory
- ✓ Sequencing
- ✓ Short-term memory
- ✓ Socialization skills
- ✓ Attention skills
- ✓ Emotional sensitivity
- ✓ Acceptance and Self-esteem
- ✓ Effort-deferred gratification



How to Get the Most Out of Kinesthetic Arts

- Kinesthetic arts at K-12 should be *integrated across the curriculum* through drama, theater, role-play, sculpture, musicals and staging.
- Insist on physical movement, drama, simulations, role play and games in classrooms, *30+ min./daily*

So What?



Some students **would have** either failed a class, lost interest or dropped out of school... **But they didn't!** Why? Because of a positive arts experience.

Arts should be mandatory at all levels in school



Without arts in school, many will not get any exposure, or the benefits.

Arts and Affluence: What is the % of K-8 kids in after school arts programs?

< \$15K	= 6%	The answer depends on the annual household income level.
\$15-30K	= 9%	
\$30-50K	= 14%	
\$50-75K	= 20.3%	
\$75K+	= 30%	

Source: 2008 DOE

What Does the Research Say?



- Arts Strengthen Your Students' "Operating System"
- Arts develop not just parts of the brain, but rather whole systems. **The systems include** attentional, perceptual-motor, our stress responses and emotional-cognitive.

What Does the Research Say?



- Arts Strengthen Your Students' "Operating System"
- Arts develop not just parts of the brain, but rather whole systems. The systems include attentional, perceptual-motor, our stress responses and emotional-cognitive.

Arts Enhance Student Operating Systems

Arts accomplish this faster, with more fun and more comprehensively than any other source we have at school.



Arts and Behavior

A YouthARTS study, at the U.S. Dept. of Justice found that arts programs designed to deter delinquent behavior of at-risk youth improved their:



- academic performance
- reduced delinquency
- increased the skills of communication, conflict resolution, completion of challenging tasks and teamwork

Secret Key To Success?

It's NOT more content -- It's the ability to process content more effectively.

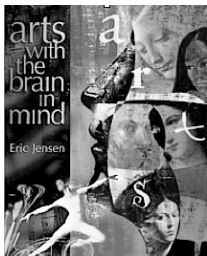
We must re-build or upgrade each brain's "operating system".



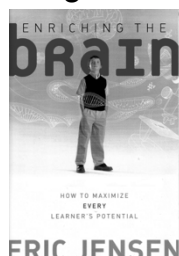
Conclusion

Arts support the development of critical neurobiological systems which enhance improved attentional, social, cognitive, academic and cultural outcomes **across ALL subject areas.**

Further Reading



Arts with the Brain in Mind
Eric Jensen

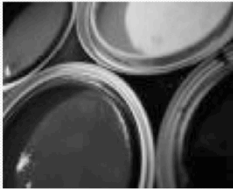


Enriching the Brain
ERIC JENSEN

www.jensenlearning.com



Would You Want to
Describe Your Life as a:



Work of art?

OR..

A standardized
test?