

Objectives

- Discuss the science of doodling
- Identify sources of student distraction
- Discuss the use of technology

Where It All Starts ?

Boredom
Daydreaming
Passing time

The Doodler

Are YOU a doodler?

The Doodle Defined

"An aimless scrawl made by a person while his mind is more or less otherwise applied."
- Oxford English Dictionary

Mind Otherwise Applied

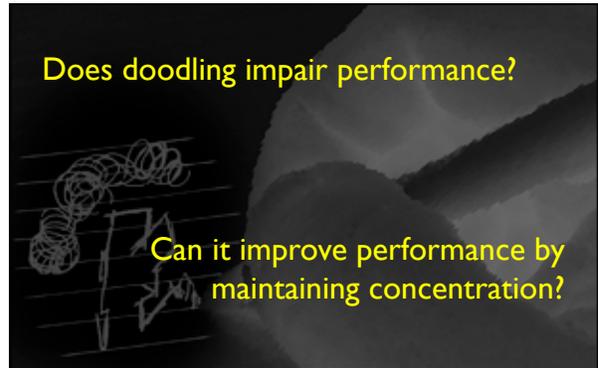
- Idleness
- Boredom
- Leisure
- Meditation
- Concentration

Doodling is a Motor Act

| | |
|---|--|
|  Alleviate Conditions |  Occur if Occupied |
|  Crucial Activity |  Similar Effects |

Does doodling impair performance?

Can it improve performance by maintaining concentration?



Doodling @ Brain Parallels

Stimulus

Stimulus-Oriented Stimulus-Independent

Stimulus Oriented Thought



Stimulus Independent Thought



Decreased Performance

Task-specific resources are limited



A Phone Message

Lorjaon
Pawliace
GlouCester
Colchester
Hildzie
JenEly
Peterborogh
Edinbrough



Audio Task @ Doodling

40 Participants

The Doodlers

Shard 3
Wrote 3 names
1 false recall
15 scored perfect 8

29%

The Control

Wrote 7.1 names
5 false recalls
8 scored perfect 8

Doodling @ Concentration

Helps to stabilize arousal

People stay awake
Reduces high levels of autonomic arousal

Doodling @ Concentration

Reduces daydreaming

Linked to high arousal levels during boredom
Occupies central executive resources
During tasks with competitive resources

Doodling @ Concentration

Adds resource load

Loads executive resources when underused

Doodling @ Learning

Attention & Learning

ATTENTION:
 "The ability to attend to desired or necessary stimuli and to exclude unwanted or unnecessary stimuli."



Attention & Learning

Learning **Stimuli**

- Absorbing
- Processing
- Remembering
- Retrieval **Stimuli**



Working Memory

- Cognition
- Inputting info
- Unforgotten
- Info processed



Chunking Information

Alcohol Trauma Trauma
 Epilepsy Infection Infection
 Insulin Insulin
 Overdose Overdose
 Uremia Uremia
 Insulin Psychosis Psychosis
 Stroke Stroke

fbicbsibmirs
 fbi cbs ibm irs



Adding to Working Memory

- Attention needed
- Rehearsal needed
- Must occur quickly



Long-Term Memory

INFO

Verbally

Visuospatially

ATTENTION

My Name Is LTM

LTM & Association

Heart not working

Loss of fluids

Vessel integrity

New info?

New & Unique info?

My Name Is LTM

Expert Memory

EXPERTISE: Comes from practice that develops domain-specific knowledge.

Organized into chunks

Mentally Maneuvering

Takes Attention

Levels of retrieval

Can be a challenge

Limits of Attention

Attentional Control

Controlled Attention

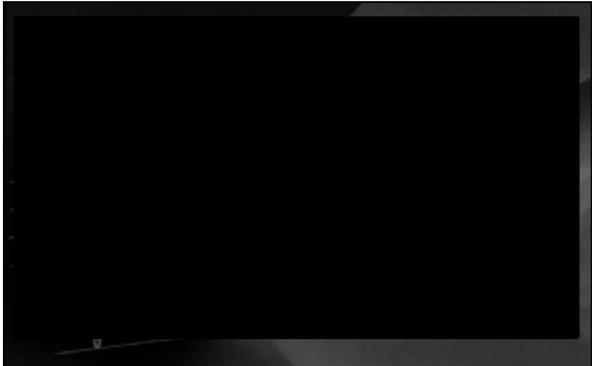
Conscious awareness
Significant effort

Instinct
Automatic
Sudden changes

Stimulus-Driven

Distractions are Sudden Changes

- Captures the attention
- Rapid changes
- Pace of message

Distractions are Sudden Changes

- Interference of memory
- Each distraction
- Limited capacity
- Information lost
- Intelligence dims



Distractions are Sudden Changes

- Overstimulation
- Can be additive
- Acculturating
- Recovery period



Distractions Can Vary

| Type of Interruption | Type of Personality | Type of Task |
|---|---------------------------------------|-------------------|
| Auditory v. Visual Frequency Complexity | Modality Motivation Type A v. B | Simple v. Complex |

Sources of Distractions

| | | |
|--|---|--|
|  External |  Internal |  Boredom |
|  Poor Listening |  Speech-Thought | |

Multitasking

- Ineffective
- Loss of attention
- Limited resources
- Shifting attention



Consequences of Multitasking

Attention shifts back and forth

Easily distracted

Memory affected

Increased time
Less accurate



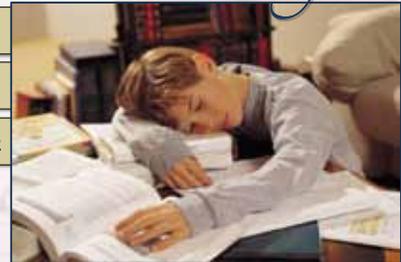
Consequences of Stress

- Affect attention
- Memory affected
- Impaired thought
- Reasoning
- Cognition
- Performance



Sleep, Brain, & Learning

- Nourishment
- Memories
- Gain insight



Improving Attention



Manageable Pieces



Controlled Stress



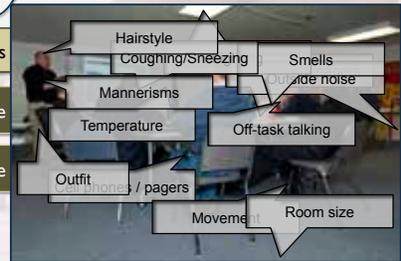
Adequate Sleep



Manage Distractions

Managing Distractions

- Identify distractions
- Modifiable
- Non-modifiable



Unavoidable Distractions

Event 1
ALERT

Event 2
INTERRUPTION

RECOVERY
Beginning or end
Mental bookmark

Deconstructing Tasks

Breakdown tasks

1 cognitive task

Preserve thoughts

Attention Span & Doodling

Doodling: Purpose & Benefits

Students to focus

Stops daydreaming

Dual Task Situations

Cannot compete

Limited pathways

Ventral stream

Dorsal stream

Note Taking

Doodling & Visual Tasks

- 34 participants
- Watched video
- Given paper/pens
- Allowed to doodle
- Questionnaire



Doodling & Visual Tasks

Discussion

Most scored 100%
 24/34 participants
 34 doodled
 Done at a private school
 May take learning more seriously

NOT SUPPORTED

Doodling & Visual Recall



Doodling & Visual Recall

14 Participants

The Doodlers

Mean 15.86/20 points
 Negative effects
 Glanced at doodles
 Multitasking

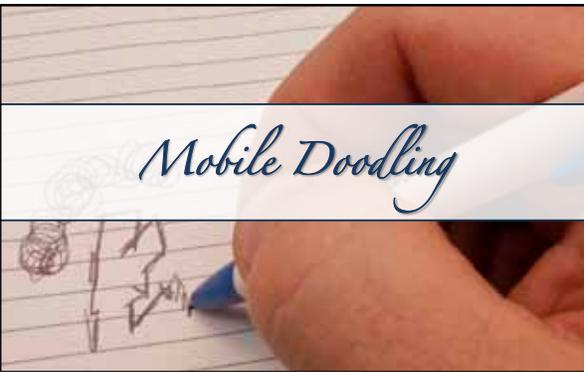
The Control

Mean 19.29/20 points
 Able to focus on task

Implications for the Instructor



Mobile Doodling



Mobile Learning: Defined

"Portable process of teaching and study using internet-connected devices such as laptops, tablets, and smart phones."



Perceived Problems: Phones

Ringing

Cheating

Multi-tasking

Cameras



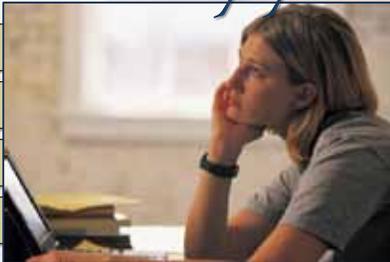
Perceived Problems: Laptops

Sounds

A wall

Multitasking

High-tech doodle



Responses to Tech Distractions

Ban Devices

Shut-off Wireless



Distraction as an Opportunity

No studies, yet

Self-reported

Email & Surfing



Whose fault is it if distracting activities are going on?

What caused the distractions other than the availability of technology?

Will alternative distractions occur if technology tools are removed?

Encouraged Distraction?

Use of Social Media + In class Discussion = Multitasking Distracting Disengagement



Learning Supported by Mobile

- Behaviorist**
Create stimulus-response connections
- Constructivist**
Support construction of knowledge
- Situated**
Used in authentic context & culture

Learning Supported by Mobile

- Collaborative**
Learn through social interactions
- Informal / Life**
Use outside of the classroom & context
- Teaching / Learning**
Support of human performance

iPads

- Affordable
- Lightweight
- Common OS

Use of Twitter

- Backchannel
- Use during class
- Outside of class

Use of Texting

- 73% of pop.
- Generational



Use of Cellphones

- Remind 101**
- Group message
- Phone # private



Use of Cellphones

- Poll Everywhere**
- Polling
- Q&A
- Quizzes



Use of Cellphones

- Celly**
- SMS-message
- Polls & quizzes
- Take notes
- Study groups
- News updates



Use of Cellphones

- StudyBoost**
- SMS-quizzes
- Self-generated
- Inst-generated
- Multiple choice
- Open-ended



Promising Practices

- Filtering Apps
- Contracting
- Education
- Remix Lectures
- Involve Learners



Is it Effective?

| | | |
|---|--|---|
| Did mobile learning make a difference in achievement? | Did the students think mobile learning affected their success? | How did the students use digital devices during class? |
| Could not be proven Higher score w/ iPad | Not really More motivated More comfortable | Facebook Email Surfed on-topic site Search for answers Other on-tasks |

Pedagogy is Still Needed

| | |
|---------------|---|
| Grades |  |
| Communication | |
| Construction | |
| Critiquing | |



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Thank You!