

# *The Effects of Computer-Assisted Instruction on Physical Skills Acquisition*

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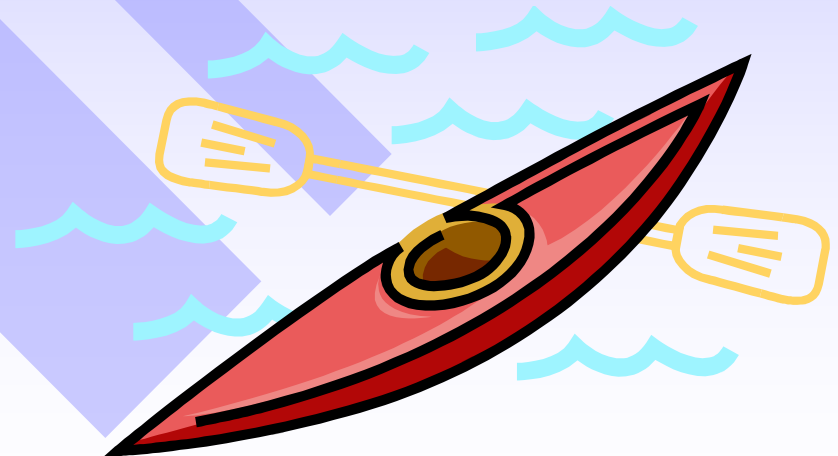
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# Overview

- Background
- Methods
- Results
- Discussion
- Questions



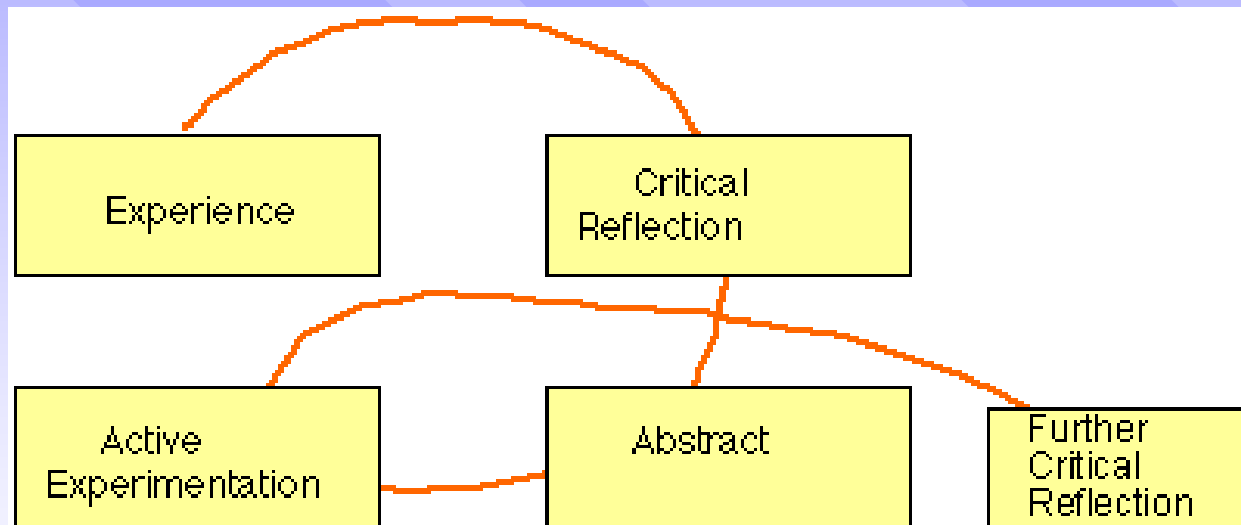


# Background

- **Experiential Learning**
  - Kolb
- **Layered Learning Theory**
  - Repeated exposure to material increases comprehension. (Schwartzman & Tuttle, 2002)
- **Computer-Assisted Instruction**
  - Combines traditional instruction with Internet, CD-ROM, or other computer technology.

# Experiential Learning

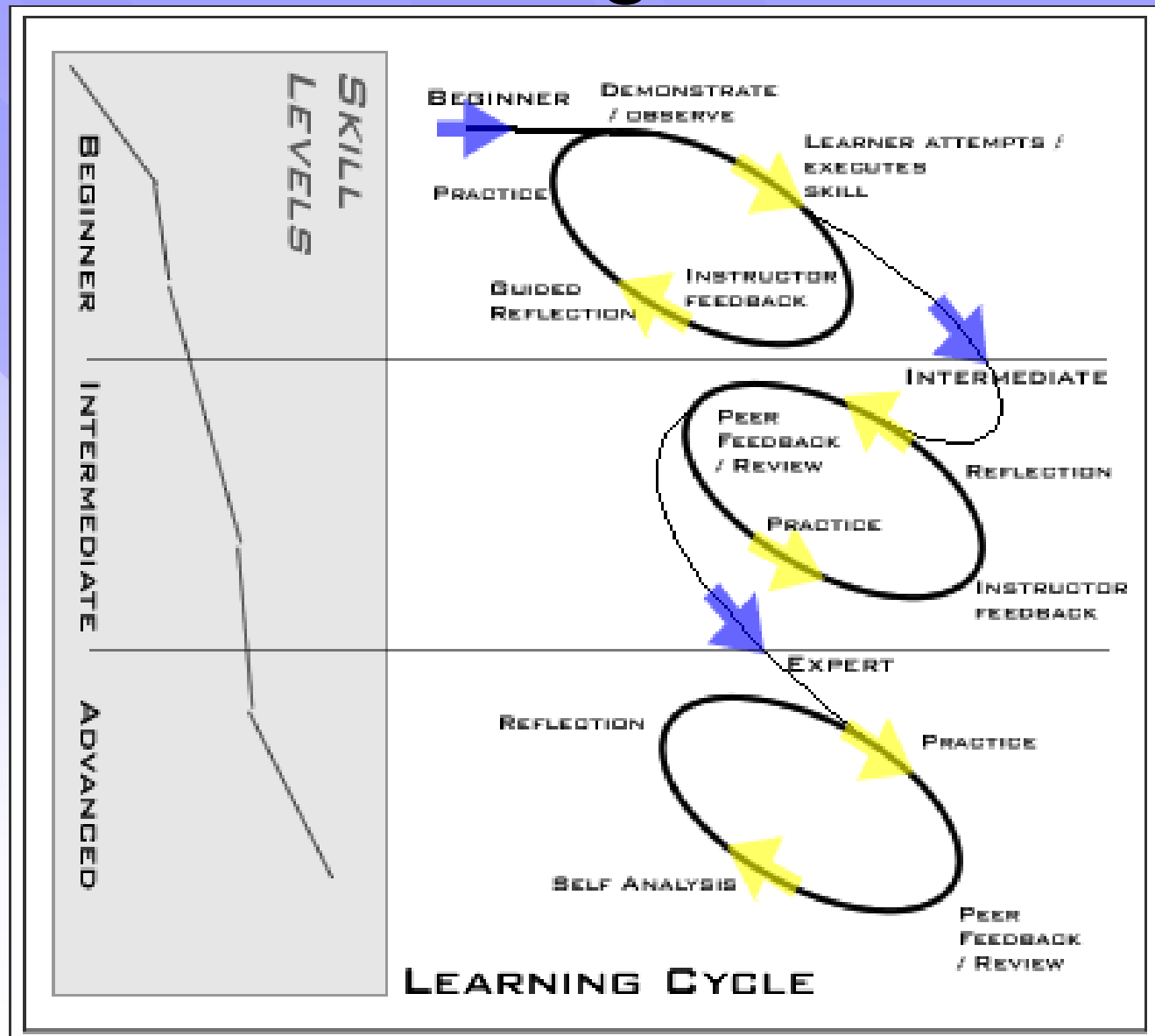
## Kolb Cycle of Learning (Curtis Kelly)



<http://iteslj.org/Articles/Kelly-Experiential/>

# Experiential Learning

Our proposed cycle of learning





# Background

- Computer-assisted instruction resulted in higher achievement than no instruction of physical skills. (McKethan, Everhart, & Sanders, 2001)
- Interactive video instruction was more effective than self-directed instruction (Walkley & Kelley, 1989)
- Multimedia has a positive effect on learning in most cases (Liao, 1999)

# Background

## ■ Problem

- We do not know the effects of computer-based learning assets on acquisition of physical skills.

## ■ Action

- Examine effects of web-based video instruction on learning physical skills

# Hypothesis

- Participants who receive web-based video instruction on the forward stroke and the sweep stroke will perform the skills better than those who do not receive web-based video instruction on the two skills.





# Method

## ■ Participants

- 26 adults ages 19 to 51

  - Median age = 27

- Female: 58%                      Male: 42%

- White: 84%,

  - Hispanic: 4%

  - Asian-American: 4%

  - Native American: 4%

  - Other: 4%

# Method

## ■ Participants

- 77% had no experience with kayaking
- 69% had DSL/Cable or On-campus connection to the internet

# Variables

- Independent Variable
  - Web-based video learning group
- Dependent Variables
  - Post-test forward stroke score
  - Post-test sweep Stroke
- Covariates
  - Pre-test forward or sweep stroke score
  - Number of times videos watched

# Method

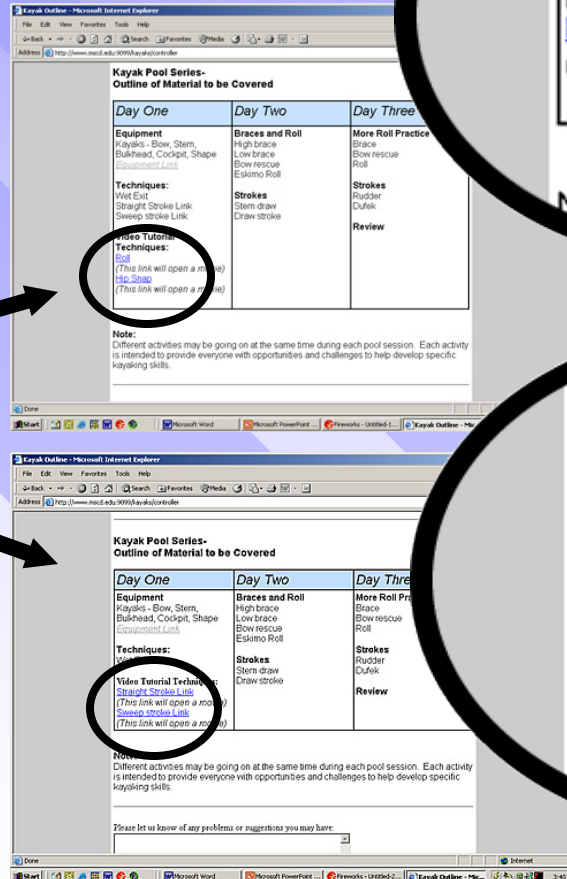
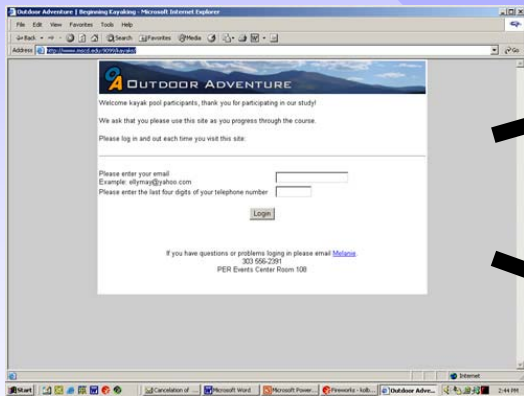
## ■ Procedure

- Assessed skills after first class
- Asked participants to visit a web page
- Assessed skills after last class
- 3 kayak classes over 3 weeks

# Method

Web pages:

<http://www.mscd.edu:9099/kayaks/>



Straight Stroke Link  
Sweep stroke Link

**Video Tutorial Techniques:**  
[Roll](#)  
(This link will open a movie)  
[Hip Snap](#)  
(This link will open a movie)

Note:  
Different activities may be going on at the same time during each pool session. Each activity is intended to provide everyone with opportunities and challenges to help develop specific kayaking skills.

Equipment Link

**Techniques:**  
Wet Exit

**Video Tutorial Techniques:**  
[Straight Stroke Link](#)  
(This link will open a movie)  
[Sweep stroke Link](#)  
(This link will open a movie)

Note:  
Different activities may be going on at the same time during each pool session. Each activity is intended to provide everyone with opportunities and challenges to help develop specific kayaking skills.

# Videos – 1 of 4



# Videos – 2 of 4



# Videos – 3 of 4





# Videos – 4 of 4



# Results Forward Stroke

## Main effect

Group:  $F(24,2)=3.67, p<.05$

## Covariates

Pre-test Score:  $F(24,1)=0.78, ns$

Video Viewing:  $F(24,1)=3.22, p<.05$   
(M=2.67)

# Results Forward Stroke

Group	Mean Number of Hits	
No Videos	2.80	
Relevant Videos	1.59	
Irrelevant Videos	4.41	



# Discussion

## ■ Application

- University and secondary schools
- Outdoor leadership programs

## ■ Limitations

- Small Sample Size
  - No traditional control group
- Loss of learner control
  - Difficulty pulling students to the web
- Bandwidth/Resolution

# References

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Liao, Y. (1999). Effects of hypermedia on students' achievement: A meta-analysis. Journal of Education Multimedia and hypermedia, 8(3), 255-277.

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Schwartzman, R. & Tuttle, H. (2002). What can online course components teach about improving instruction and learning? Journal of Instructional Psychology, 29(3), 179-188.

Walkley & Kelley, (1989).



# Questions?