The Power of Peers: Findings from Peer Assisted Learning Research

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Focus of Research

Instructional Effectiveness

Pedagogical Content Knowledge

Physical Activity
Bloom (1984): Two Dissertations

- Conventional Instruction: one teacher and 30 students
- Mastery learning: one teacher and 30 students however mastery to a criterion is achieved before progressing - monitored by tests and feedback is provided relative to the tests
- Tutoring: one-on-one tutoring with the same focus as mastery learning
The Settings

- Grades: 4th, 5th & 8th Public Schools
- Samples: 4 samples per grade level
- Subject: Math
  »Probability and Cartography
Findings

FIGURE 1. Achievement distribution for students under conventional, mastery learning, and tutorial instruction.
Conclusions

• “the most striking of the findings is that under the best learning conditions we can devise (tutoring), the average student is 2 sigma above the average control student taught under conventional group methods of instruction.”

(Bloom, 1984, p. 4)
The Two Sigma Problem

“Can researchers and teachers devise teaching-learning conditions that will enable the majority of students under group instruction to attain levels of achievement that can at present be reached only under good tutoring conditions?”

(Bloom, 1984, p. 4).
Theoretical Influences

• **Task Systems**
  - Walter Doyle (Education)
  - Daryl Siedentop (Physical Education)

• **Behavior Analysis**
  - B. F. Skinner (Psychology)
Tasks Systems: The Ecological Model

- Walter Doyle- Arizona State U.
  - The task is central unit of measurement in teaching.
  - “If there is no accountability, there is no task”
  - Instructional, managerial and social task systems that overlap and interact.
Task Systems-Physical Education

- Daryl Siedentop- Ohio State U.
  - The development of the task systems in physical education
    Managerial, Instructional, Transitional, Social
  - Explicit and implicit tasks
The Development of Task

Teacher states task

Student performs task
  • as stated
  • makes it easier
  • makes it harder

Teacher accepts performance or restates task task
  - using formal or informal accountability
Behavior Analysis

• B. F Skinner

• Environmental ecological approach
  – Focus on establishing good instructional conditions for learning
  – Group and individual consequences for success
  – Immediate rather than delayed consequences
The Early Studies

- **Settings**
  - Badminton, Volleyball, and Basketball (16 days each)
  - High school physical education

- **Dependent measures**
  - Total trials performed and correct technical trials

- **Independent Variable**: Peers hold each other accountable
  - Keep a record of a performance
  - Discriminate differences between correct and incorrect technical performance if kept simple

  Ward (1993)
Results

- Increased number of trials
  - Workloads X 3 and 4 times over teacher lead instruction
- Increased number and rate of correct trials
  - increased by 20%
- Low, average and high-skilled students improved, regardless of gender
Classwide Peer Tutoring and CPR

- College age students, learning CPR
- Standard CPR training-instructor led versus Classwide Peer Tutoring (CWPT)
- Dependent measures
  - Percent correct performance

CWPT and CPR Results

[Bar chart showing comparison between Standard and CWPT results]
Upper Elementary School

- 4th - 6th grade (10-12yr olds)
- Volleyball – correct performances
  - Passes/sets/serves
- Three conditions
  - Working alone (A)
  - Working in pairs – peer encouragement (B)
  - Working in pairs records kept (C)
- Yoked Design
  - A-B-A-C
  - B-A-C-A
  - C-A-C-A

Crouch Ward & Patrick (1997)
The effects of peer-mediated accountability on task accomplishment during volleyball drills in elementary physical education
## Mean Rate per Student

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<th>Class &amp; Conditions</th>
<th>Forearm Passes</th>
<th>Overhead Sets</th>
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Classwide Peer Tutoring

- Grade 3 (8-9yr olds)
- 20 lesson striking unit
- Dependent measures
  - Correct trials,
  - Total trials
  - Time
- Independent Variable
  - Classwide peer tutoring

Results

• Fewer total trials
• But more correct trials
  – Similar gains for low and high-skilled female students
  – Males improved but gains were varied
• Time
  – compared to baseline CWPT created similar engaged time
Using CWPT with students with Autism

- 3 chn, 8 yrs old Kindergarten
- All with mild-moderate Autism
- Inclusive setting-catch unit of instruction
- Dependent measures
  - Total and correct trials
- Independent Variable
  - CWPT

Rate per 2 minute Intervals

- **WHOLE GROUP**
  - Total Trials
  - Correct Trials

- **CWPT**
  - Total Trials
  - Correct Trials
From Pairs to Small Groups
On-task Behavior and Small Groups

• Grades 7-8 (13-14yrs old)
• Tag rugby-16 day instructional unit
• Dependent measures
  – Social skills (helping etc)
• Independent variable
  – Good Behavior Game
    • Small group assignment, charting, goal setting and prompts

RESULTS

Active
Waiting
Off-Task
Social Skills and Small Groups

• Grades 4,5 & 6
• 20 day Volleyball unit of instruction
• Dependent measures
  – Appropriate and inappropriate social and fair play behaviors
• Independent variable
  – Good Behavior Game (Small group assignment, charting, goal setting and prompts)

RESULTS

Baseline
Grade 5

Good Behavior Game

Appropriate Acts
Inappropriate Acts

Grade 4

Number of Incidents

Grade 6

Lessons
Conclusions

Arranging the instructional environment to include peers as contributors to the instructional objectives of the lesson can be an effective strategy.
The two sigma problem

• Peer assisted learning was always more effective than conventional instruction
  – But not always different by two standard deviations
Student Gains

• All students appear to be able to benefit from peer assisted learning strategies.
• Low skilled students and female students benefit most.
Using Peers has Strong Utility

• Kindergarten through college students
• Used successfully with some children with disabilities.
• Simple psychomotor outcomes
  – Physical education content
  – CPR and basic life support skills
• Social skills
  – Fair play behavior
Merely putting peers together is insufficient

- Peers must be trained
- Keep demands simple
  - Unclear if peers could handle more demanding tasks?
- Using peer mediation takes time to establish
  - Not a one time activity
  - Routines needed
Common Characteristics of the Independent Variables

• Grouping
  – Pairs, triads and small groups (n=5)

• Performance tracked by students using forms and charts

• Goals often used

• Reinforcing consequences for meeting goals
  – free time, more game time,
An Ethical Issue...

- Students who helped students with disabilities often did not perform as well as their typical peers.
What we do not yet know...

• Are their gains in knowledge from being a tutor?
• Does increased knowledge gained as a tutor impact performance?
• Does being a tutor have other educational benefits such as compassion.
Thank you and questions