Role of Peer Interaction in Scaffolding and Learning Transfer

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Overview

• Models of PET for teaching interview
• Excerpts on our prior study
• Group teaching interview
• Preliminary results

Model 1

Cart activity

Model 2

Light activity

Example of Transfer Problem

http://en.wikipedia.org/wiki/Positron_emission_tomography

Prior Study

• Spring 2006 at Kansas State University
• Teaching interview* of PET learning activities
  - Participant n=16
  - Algebra based physics course
• Examine the role of physical models in learning physics of PET

* Engelhardt et.al.(2004)
Some Results From the Prior Study

- The center of the circle the origin of light (14/16)
- The center of the line the origin of event (12/16)

Factors for Determining Event Location

- ‘Closer is brighter’ (7 out of 11 students)
- ‘Closer is bigger’ (2 out of 11 students)
- ‘Closer is quicker’ (2 out of 11 students)

Current Study

- Fall 2006 at Kansas State University
- Group teaching interview of PET learning activities
  - Group of two = 6
  - Group of three = 3
  - Algebra based physics course
- Examine the role of group interaction while learning using physical models in learning physics of PET

Change in Central Tendency

- Center of the circle: the origin of objects
  - We used the term “explosion” in write-up
  - Two of nine groups
- Center of the line: the origin of objects
  - We used the term “bits travel in opposite direction”
  - Eight of nine groups

Scaffolding in Determining the Location in Cart Activity

- Individual
  - None - 11 students
  - Qualitative - 3 students
  - Quantitative - 2 students
- Group
  - None - 1 group (3 students)
  - Qualitative - 3 groups (8 students)
  - Quantitative - 5 groups (11 students)

Scaffolding in Determining Number and Direction of Gamma Rays

- Individually
  - Number of gamma rays 0-1-2-4-6 (14 of 15 students)
  - Classical particle collision
  - Took 15-20 minutes to complete the task
- Group
  - Number of gamma rays 2-3-4-5 (7 of 8 groups)
  - Classical particle collision
  - Took 2-3 minutes to complete the task
Idea of Cart Activity in Light Activity

- Light intensity to determine location in light activity
  - 3 students in three different groups
  - 1 changed immediately referring to cart
  - 2 changed due to peer interaction

- Referring directly to cart activity to locate event in light
  - 5 groups immediately referred to cart
  - 4 groups discussed and referred to cart

Change in Transfer of Learning

- Individual
  - Spontaneous - 4 students
  - Semi-spontaneous - 6 students
  - Non-spontaneous - 3 students
  - No-transfer - 2 students

- Group
  - Spontaneous - 7 group (15 students)
  - No-transfer - 1 group (3 students)

Conclusion

- Students transfer ideas spontaneously more easily in group

- Qualitative reasoning is enhanced in peer interaction leading to quantitative process

- Peer scaffolding is facilitated by the immediate prior activity

Thank You!!!