

# Transfer of Prior Reasoning in Understanding Positron Emission Tomography (PET)\*

Bijaya Aryal and Dean Zollman

Kansas State University  
A-O-K Meeting  
October 28, 2006

\*Supported by NSF Grant # 04-26745

1

## Overview

- Teaching activities for Positron Emission Tomography (PET)
- College students prior ideas and their applications
- Helping students activate appropriate ideas

2

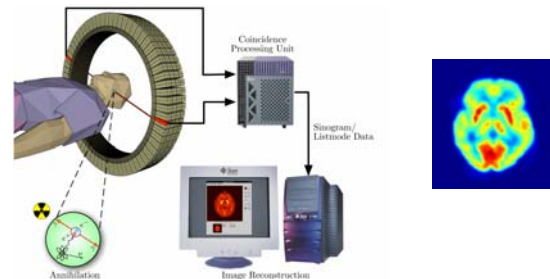
## Research Context

- Spring 2006 at Kansas State University
- Teaching interview\* of PET learning activities
  - N=16
  - algebra based physics course
- Examine the role of physical models in learning physics of PET

\* Engelhardt et al.(2004)

3

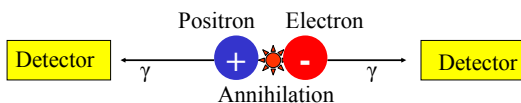
## Positron Emission Tomography



[http://en.wikipedia.org/wiki/Positron\\_emission\\_tomography](http://en.wikipedia.org/wiki/Positron_emission_tomography)

4

## Physics of PET



5

## Analogy Activity 1



Cart activity

6

## Analogy Activity 2



Light activity

7

## Influence of Central Tendency

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

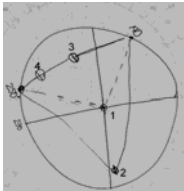


...I am so used to think that if you are gonna have two points at the end on the circle then obviously their start point is the center....

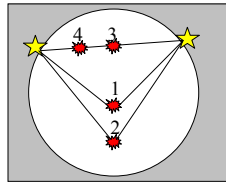
- The center of the line the origin of event (12/16)

...kinda guess where the center is ...I said the light source is at the center...I think the light source is at the middle of the line...

## Challenging Central Tendency



Students drawing



The result and the location of the lines

The numbers show the progression order in which the student selected the locations of the event.

9

## 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)

10

## Effect of Sequencing

- When light activity introduced before cart activity
  - 'Closer is quicker' used by (2/11) in light activity
- When cart activity introduced before light activity
  - 'Closer is quicker' used by (5/5) in light activity

11

## Conclusion

- Students transfer ideas from prior experience to a new learning situation
- Such transfer may be inappropriate but sometimes very robust
- Students can be helped to trigger and transfer their appropriate prior ideas by using activities in the right order

12

# Thank You!!!

**E-mail:**

[bijaya@phys.ksu.edu](mailto:bijaya@phys.ksu.edu)

**Project website:**

<http://web.phys.ksu.edu/mmmm/>

13