

Activities at Farragut's Math Computer Lab
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When we began I could find...

Software that does math. Mathematica/excel-we use them.

Software that shows math. Cabri-we use it.

Programmed instruction. (CBI)(small to moderate sized positive effect.) (Atkinson, 1984; Kulik&Kulik,1991; Niemiec & Walberg, 1985;Roblyer,1988)

I wanted software that would serve as a tool to enhance learning.

I wanted software that would help me teach more effectively.

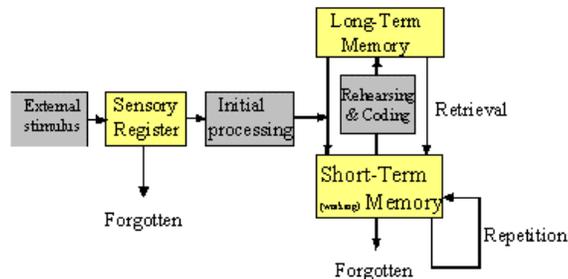
In my Educational classes

I had been taught that...

Atkinson-Shiffrin model

The Sequence of Information Processing

1. The use of the 5 senses is important in learning.
2. It is easier to teach than to "unteach" a concept.
3. Immediate feedback is most valuable.
4. Meaningful learning should begin with the concrete. (built on prior knowledge)
5. "Overlearning" drives a concept into memory.



I thought computers could help the learning process itself and...

Provide enhanced visual stimulus to the student.

Immediately identify misunderstandings.

Provide immediate feedback to all students.

Provide meaningful initial practice for learning.

I was eager to try.

Educational studies have shown...

Unusual stimuli enhance attention. (Berlyne,1965)

Intrinsic motivation is enhanced by the use of computers. (Lepper,1985)

Games can increase motivation.(Slavin,1995a)

Conceptual models help students learn (Hiebert, Wearne, & Taber, 1991;Mayer,1989)

... regarding external stimuli.

Educational studies have shown...

Working memory has a capacity of five to nine bits of information. (Miller, 1956)

"Rehearsal" is necessary for items to be retained.

Short-Term memory lasts only a few seconds.

Transfer to long-term must be made.

... regarding initial processing.

Educational studies have shown...

Active processing contributes to retention.

Information retention is enhanced by both verbal and visual representation. (Mayer&Anderson, 1991)

Massed and Distributed Practice is essential for long term memory retention.

Automaticity comes as a result of practice and is essential for higher-level learning (Bloom, 1986)

Overlearning which comes with extra practice increases retention six-fold. (Krueger, 1929)

... rehearsing and coding of information.

Educational studies have shown...
Interference (Postman& Underwood, 1973)
Inhibition (retroactive & proactive)
Unsuccessful Practice (Brophy & Good, 1986)
Ineffective Monitoring (Medley, 1979)
...are hindrances to effective learning.

For each unit I ask myself two questions:

1. Where do students usually go wrong in this unit
AND

2. Can I attack that misunderstanding electronically?

The answers to these questions have resulted in the activities we use in the Math Computer Lab.

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Advantages to a subject matter computer lab coordinator:  
Technical person is interested in student learning.  
Teacher/ pupil ratio is doubled when students are in the lab.  
Coordinator has the opportunity to focus on preparing activities.  
There is a vehicle for sharing good ideas.  
There is automatic teacher training.  
New teaching strategies using technology can be developed.  
Techno-phobia can be overcome.

Tips for a successful lab.  
Keep a schedule.  
Provide a list of activities.  
Keep a seating chart for each class.  
Ask students to report anything unusual.  
Hold students responsible.  
Expect teacher cooperation.  
Be willing to do what needs to be done.