Research Spotlight

Do Pretests Reduce Children’s Learning?

Senior Lauren Gumbel is conducting her honors thesis in collaboration with Dr. Robert Siegler to expand our knowledge of how pretests impact children’s subsequent learning. Children learn numbers with experience. Their “comfort range” is the set of numbers a child understands, which is typically 0-10 by age 4. Numbers greater than that range are fairly indistinguishable. When asked to place numbers on a number line, children overestimate the small numbers that they know best. Below are examples of how children who are comfortable with numbers between 0 and 10, but not with numbers between 10 and 20, could incorrectly place numbers on a number line. These estimates would be quite accurate if the number line was from 0-10, but they are inaccurate for 0-20.

Studies investigating this phenomenon begin with a pretest, which could be affecting results. If the pretest problems are out of the child’s comfort range, they estimate the problems incorrectly (as in the above examples), which might make it harder for children to learn the correct strategy. They would then perform less well on the posttest because they have not been able to absorb the feedback from the learning phase of the study.

Lauren is testing the effect of pretests with Children’s School students ages 4 and 5. The computerized study consists of a pretest, feedback phase, and posttest. The study consists of one 20-minute session. Children are randomly assigned to three study variations. The pretest for the first version is a set of random numbers 0-10, numbers that should be in the children’s comfort range. Version two’s pretest is 0-20, which will most likely lead to the children overestimating, making learning during the feedback stage potentially more difficult. Version three has no pretest, which helps us determine the effects of the other variations.

The children click the place on the number line where they think the number displayed on the screen should go. A red line appears (as in the above examples) where the child clicked. During the feedback problems, a blue line appears where the correct answer is. If the answer was close, the computer says “Very Close!” and Lauren tells them so as well. If not, the computer says “Not Quite” and she explains where the line should have been.

This study is important because it could tell us whether the common practice of testing children’s knowledge before instruction might sometimes lead to less learning than if no pretest had been given. If so, a change in this classroom and research practice may be needed.
Robotics Research Featured on Plum TV

The robot Keennon was featured on Plum TV's "Masters of Innovation" in an episode entitled "Robots" about Carnegie Mellon University's Robotics Institute. Keennon is a small yellow robot designed to study the underlying mechanisms of social communication by interacting with children. Keennon has four motors, a rubber skin, two cameras in its eyes, and a microphone in its nose. Its simple appearance and behavior are intended to help children, even those with developmental disorders such as autism, to understand its attentive and emotive actions. For several years, we have collaborated with Marek Michalowski (Robotics Department) as he works to improve Keennon’s synchrony with children’s motions so that the robot behaves as naturally as possible.

View the segment filmed at The Children's School...

http://vimeo.com/18431799

The link to the full episode is…
www.plumtv.com/videos/masters-of-innovation-robots

Undergraduate Spotlight: Getting to Know You !!

Alexandra Tapak is currently a CMU sophomore doing undergraduate work-study at The Children’s School for her second semester. She loves interacting with the children because they always have the most interesting things to say, and every day is a new adventure with them. Alex observes so many things every day because the children are constantly growing and changing. She’s seen an amazing difference since she started in September and can’t wait to see what has happened by the time May rolls around.

Alex is majoring in Psychology and Biological Sciences; she plans to go to medical school to pursue a career as a neurologist. At Carnegie Mellon, Alex is on the tennis team and cannot wait for the season to start in a few weeks. She loves spending time with her teammates, who are all so talented in many ways. Alex is also the sports editor of The Tartan, which is the campus newspaper. In that role, she gets to meet other athletes and watch Carnegie Mellon’s various sports teams compete. This fall, Alex joined Kappa Kappa Gamma, which has really been a wonderful experience of meeting so many new people and getting involved in the Carnegie Mellon Community.