How We Learn

What can be learned when people fall down? Where I work we have an amphitheatre. When lighting folk enter they are initially impressed by the large room, then they proceed to gaze upward as they walk forward. There is a gradual slope with a few steps down to the stage. They fall down. This is funny in concept but instantly humbling for the injured. Lighting professionals who are always looking up at the lighting are missing the bigger picture. The lighting is our focus and interest but narrowing our view excludes information that can be equally or more important. Out of compassion and fear of lawsuits we have installed contrasting stair nosing and brighter lights marking the aisles. People still crumple to the carpet. To prevent future attendees from dropping in droves we now issue verbal cautions on entry.

The people hearing our warnings at least store the message in short term memory and safely take their seats. The ones who hit the floor likely store that painful warning as a more permanent memory. At least while in this amphitheatre they have learned to be cautious about watching their step. Some may make the mental leap to always be careful walking while looking up as a result of their carpet dive. This assimilated information alters our behavior and survivors adapt. We are learning unintentionally with varying degrees of effectiveness.

Your brain does not care whether you want to learn, it won't stop. We do not have to even think about the process, but learning is more effective when we do. Learning comes whether we are conscious of it or not but when it is focused, relevant, interesting and/or experiential, retention improves. To continue to exist implies learning. It is an automatic brain (survival) process that is unavoidable.

How do we make the learning process more effective? What can current research reveal about how people learn and how the brain processes information? Can we use this to retain more of the lighting information that we are exposed to?

Scientific theories about education hope to clarify intelligence, explain how it is achieved and can be measured. Multiple authors investigating the learning process or how to understand understanding, have identified four necessary components of deep learning. This learning cycle is sequential and usually includes experience as a primary element. This is evidenced by the learning curve above for people that fall in the amphitheatre. A second part of the cycle would be reflection. We need to think about what we have learned to improve retention and comprehension. This should lead to the third part of the cycle which is the abstraction of being able to see how the experience relates to other experiences. If the person who fell can relate that to other times that they are looking up at the cost of falling down, they have learned something that will help them when confronted with similar situations. The fourth part of the cycle is testing. If we enter another amphitheatre with caution and see that by being conscious of the stair pattern we prevented falling then our brains retention is enhanced or secured. This four step process

works best when the learner is conscious of it. It applies to the educational process inclusive of lighting but with ramifications to all personal growth.

This four step learning process parallels the latest brain mapping research. The cerebral cortex of our brain has three functions, sensing, integrating and motor (movement or acting on the information learned). Think of experience as an aspect of sensing and integrating correlates to both reflection and abstraction as the brain evaluates the information that the senses have provided. The active testing function of the cerebral cortex corresponds to movement or motor functions as we generate actions that put our lessons into practice. Brain mapping research validates the structure of the four step learning cycle to improve retention and the ability to apply learned information. When you are sitting in your next session at the IES Conference or Lightfair remember how important it is to review your notes or handouts in order to retain the lesson. If you can then act upon this by applying what was learned or teach it to someone else your retention will be dramatically improved.

Teachers and students need to be careful about building new information on top of false beliefs and naïve understandings that we may have about some subjects. There is a book about a fish who wants to know what is happening on the land. He makes friends with a tadpole who grows into a frog and eventually goes out onto the land. The frog returns to the fish and describes things like birds, cows and people. The book shows pictures of the how the fish is visualizing the frogs descriptions. Each shows a fish-like form slightly adapted to accommodate the image imagined from what the frog has told him. The fish envisions people looking like fish who walk on their tailfins and birds look like fish with wings. This illustrates creative potential and the risk involved in building new information on current knowledge that is limited. An accurate understanding of lighting fundamentals is necessary to build new information upon. Too narrow a view of our field creates a mental filter that will exclude or misconstrue information that could be important to our professional growth and credibility.

Fundamental classes are the most frequently scheduled and have the highest attendance at lighting manufacturer based education centers. At the Lighting Solutions Center we are often asked to provide a fundamentals session to begin a two or three day custom agenda for customers. Many attendees have years or even decades of lighting experience but want to refresh their knowledge or fill in any gaps they may have before an in-depth course begins. This improves accuracy and retention as well as expanding their view or mental filter of lighting related experiences.

The increasing complexity of the lighting industry requires new skills to successfully sift through the information overload and retain what is important. If you are trying to learn something new, think about the process noted above and spend time reflecting on or evaluating the information. Then use it or teach it to anyone who will listen, as soon and as often as possible. As a teacher, consider the responsibility inherent to your position. We have an obligation to understand how we learn so that we can teach effectively. Once we know how to teach effectively can there be any good reason not to?

What can be learned when people fall down? The next time you find yourself walking while looking up at the lighting, please consider those fallen colleagues then reflect upon the event, think about times when you can use this example to keep yourself vertical & act upon that information in the future. That conscious technique is applicable beyond the amphitheatre. Commit this four step process to memory and you will have learned from their experience and they will not have suffered in vain.