

Chapter 17

Epilogue

We opened our discussion of the ULM with the question: What is learning? In this book, we have presented an answer: a theoretical model of learning that we call “the Unified Learning Model” (ULM). Learning in the ULM is a relatively permanent change in a person’s knowledge. This knowledge at its most basic biological level is the relatively permanent change in a neuron or group of neurons. Understanding that learning is the change in a neuron complex in the brain allows us to understand that learning is a product of those things that change neurons. These are attention, repetition, and connection. Attention, repetition, and connection occur primarily in working memory. Thus, the first principle of the ULM anchors learning in working memory; specifically how limited working memory capacity is being allocated. Working memory capacity however is not static. It is changed by knowledge. As the second principle of the ULM notes, the more knowledge we have, the more working memory capacity we have. Learning begets more learning and begets more complex knowledge as the capacity of working memory expands to allow integration of more and more knowledge in larger interconnected chunks and networks. Finally, according to the third principle of the ULM, we allocate our potential working memory capacity according to how we are motivated.

The principles of the ULM define what can be thought of as *mental contiguity*. This notion of the ULM as mental contiguity takes a statement such as “hands-on; minds-on” from a platitude to something potentially meaningful. The ULM defines what it means to have your “mind” on something.

When we say that a student needs to allocate their working memory to the learning task, what we mean, in one sense, is that students need to be “in contact” or contiguity with what we want them to learn. Contiguity is the basic principle in both the classical conditioning of Pavlov and the operant conditioning of Skinner, as well as fundamental to the association rule of working memory.¹

Contiguity is also behind some of the more prevalent findings from the “process-product” research in the 1960s and 1970s on the relation between teacher behaviors and student outcomes. These studies found that time on task and amount of curriculum covered during the school year were the major determinants of student outcomes.² Students can’t learn something if they never come in contact (contiguity) with it, whether in school or elsewhere.

What the ULM does is refine the notion of contiguity from a purely physical presence (the student is in the same place as what is to be learned) to a *mental* presence (the student needs to have their “mind” in the same place as what is to be learned).

Essentially, students who do not engage with their learning according to the principles of the ULM might as well not be there. They may be in the classroom or performing an activity, but if their minds are not attending to information, doing repetitions, and making connections, they might just as well be somewhere else. Physical contiguity is necessary in school learning. That is, the student has to show up in school for anything to happen. That is not sufficient, however. Learning only happens when students have mental contiguity through the principles of the ULM. It is this mental contiguity that we are trying to motivate students to engage in. It is this mental contiguity that teachers are trying to facilitate through their instructional methods, materials, media, and activities.

The ULM espouses three principles of learning:

1. Learning is a product of working memory allocation.
2. Working memory’s capacity for allocation is affected by prior knowledge.
3. Working memory allocation is directed by motivation.

These three principles are enacted through five rules of learning that provide specific guidance for realizing them in teaching:

1. Direct student attention to the desired knowledge to be learned. Help students focus attention on relevant materials and avoid distractions through the learning environment, instructional materials, and connection to students’ prior knowledge.
2. Provide necessary repetition. Provide multiple exposures to the knowledge to be learned and opportunities for recall and practice.
3. Facilitate connections. Provide ways for students to connect what they are learning to what they have previously learned in the class, what they have learned in other classes, and their other prior knowledge. Help them to construct meaningful connections between what they know and what they are learning.
4. Provide motivation to facilitate effort. Recognize that learning can be difficult and provide support for maintaining students’ motivation.
5. Remember that learning is learning. Directing attention, providing repetition, facilitating connections, and providing motivation are the parts of good instruction. There are no short cuts; good teaching and instruction do not follow fads.

Teachers and other educators who follow the ULM can ensure that their students have their “minds on” their learning, whether they have their hands on or not. This mental contiguity will maximize student engagement and ultimately student learning and achievement.

Notes

1. King, D. B., Viney, W., & Woody, W. D. (2009). *A history of psychology* (4th edn.). Upper Saddle River, NJ: Pearson Education; Leahey, T. H. (2004). *A history of psychology, a: Main currents in psychological thought* (6th edn.). Upper Saddle River, NJ: Prentice Hall.
2. See Good, T. L., Biddle, B. J., & Brophy, J. E. (1975). *Teachers make a difference*. Oxford, England: Holt, Rinehart & Winston.