Left of the Fire and Above the Elephant

A glimpse into the mathematical mind of Dr. David Dirlam, VWC's new Director of Institutional Effectiveness and Accreditation

By Stephanie Smaglo | March 13, 2013

Dr. David Dirlam

WARM WELCOME: At a young age, Dr. David Dirlam made it his life's work to define a unit of analysis for psychology. This path has led him to a career filled with new discoveries through assessment data, ultimately bringing him to VWC. (Photo by Janice Marshall-Pittman)

Imagine that the park bench is to the left of the fire and above the elephant. Now rotate that image 90 degrees clockwise. Who's where?

Within 15 minutes of meeting David Dirlam, this is the puzzling direction the conversation has taken. His inquisitive, seemingly limitless, intellect is instantly apparent, a level of brilliance that might catch you off guard if you're not expecting it. But there's something else. You may have to look close to see it but, at 71, he has a child-like glint in his eye, a window into a character defined by curiosity, creativity, passion and awe. Dirlam brings these traits to his new role as Virginia Wesleyan College's Director of Institutional Effectiveness and Accreditation.

Born in the "Crystal City" of Corning, New York, world renowned for its glassmaking, Dirlam is a self-proclaimed professional black sheep in a family filled with generations of glass furnace designers. Moving around frequently as a child, his family eventually settled in the city of Muncie, Indiana, where Dirlam attended Ball State University's campus school from second grade through high school.

He headed to Northwestern University in the early 1960s, pursuing a bachelor's degree in psychology with a minor in mathematics.

"I was attracted by a young professor whose background was in comparative and physiological science," he says. "I had an interest in biology and social statistics, so that seemed to kind of combine them together."

A fan of the Canadian model of education – less spoon feeding and more research, he says – Dirlam acquired his master's and doctoral degrees from McMaster University in Ontario, specializing in physiological, developmental and mathematical models of psychology.

Behaviorism, headed by B. F. Skinner, was the ascendant form of psychological science at the time, but at McMaster Dirlam was drawn to the work of pioneering cognitive scientist Lee

Brooks. Brooks created problems that unmistakably proved that human use of images could be studied scientifically (like the rotating park bench, fire, and elephant). Brooks introduced Dirlam to the work of American linguist, philosopher, and cognitive scientist Noam Chomsky, who had published a critique of Skinner's Verbal Behavior, arguing that Skinner did not have a unit of analysis to measure his findings. This review would ultimately chart the course of Dirlam's future.

"If Skinner didn't have a unit of analysis for language," he says. "Then the whole idea of psychology as a science had a serious problem because there wasn't a unit of any kind of behavior. I was in my third year of graduate school and I'd always wanted to be a scientist. I thought, it's not really a science if there's no unit of behavior. I decided I was going to spend my life on that problem."

Dirlam began studying the mathematics of organization, finding that grouping items into twos, threes and fours would increase organizational efficiency (think phone numbers). He later published his findings in the third edition of the journal Cognitive Psychology. Today, he explains his theory in terms of organizing the books on his office bookshelf.

"The problem is that human behavior is enormously complex and our brain is limited," he says. "A library subject catalog needs nearly as many headings as books. That would not work for behavior. But there is a solution from set theory. It's this whole idea of using ordered x,y pairs to make up the X and Y dimensions. For three dimensions, you use triplets (x,y,z), and physicists readily extend this to four dimensions using ordered quadruples and so forth. Now imagine that you have four levels in each dimension. With two dimensions you get 16 possible ordered pairs, each one a unique pattern of one of the four x's and one of the four y's. You add another dimension and there are 64 possible patterns; add two more dimensions and you've got a thousand patterns. With five dimensions at four levels each, you only need twenty concepts to organize a thousand books. With 40 concepts you can organize a million books. Eighty concepts gets you a trillion. Now it's starting to get interesting as a unit of behavior."

His next step was to figure out how to organize the dimensions and patterns, a problem he solved by working with children. While completing his doctorate, Dirlam taught developmental psychology at St. Norbert College in Wisconsin. In what began as a class exercise, he and his students started a nursery school.

"It was really through thinking about the different types of organization that kids use, that I realized that that's really the way human beings organize the world."

Assessment, Accreditation, and the Search for Answers

Once he realized that human development was the key to his unit of analysis, Dirlam began searching for a wider age span to work with. He headed back east, becoming director of the campus school at the State University of New York (SUNY) College at Plattsburgh. In the mid-1970s, he and his colleagues made history with the early invention of academic rubrics, educational assessment tools that use a set of criteria and standards linked to learning objectives.

“We developed these multi-dimensional analyses of children’s drawing and writing while I was there,” he says. “We created what are called standardized developmental ratings of student’s writing and we helped to make the nation’s first natural language writing exam. The writing community started using our assessment tools and calling them ‘Rubrics.’”

Rubrics eventually made their way to higher education, creating more opportunities for positions in the assessment and accreditation field. Over the next 20 years, Dirlam held administration and teaching positions at King College, Savannah College of Art and Design and Hebrew Union College–Jewish Institute of Religion before making his way to Virginia Wesleyan.

In the past decade, Dirlam has begun conducting developmental interviews. Thousand-sample studies using developmental rubrics have made it possible for him to find a mathematical model that provides a remarkably simple explanation of the complex problems human development researchers face. It occurred to him that people who were experts in any kind of field could make use of the progression of four different skill levels that seemed to come up repeatedly, most recently using them to evaluate VWC’s Global Scholars Program.

“The developmental levels in each dimension are strategies. The first one, think scribbles, doesn’t grow and doesn’t compete. The second one – stick men, geometric shapes and baselines – grows very fast, but also does not compete. The third one grows slower – curved bodies, three dimensional shapes, and base planes – but is much more competitive. The fourth one – chiaroscuro, true perspective, design elements and principles – grows slowest but is the most competitive.”

This “succession model” not only works for drawing and writing development, but also for historical development, which has no-growth, fast-growth, competitive-growth, and very competitive strategies. The model, says Dirlam, has described changes in the frequencies of research strategies found in more than 900 articles written from 1930 to 1992.

Dirlam has connected personally to his profession, as it keeps him asking questions and searching for answers.

“It’s a really interesting thing to do,” he says. “That’s what kept me on this path my whole life. I kept finding things that I didn’t know before, and then I realized that nobody knew them before. I’ve gone places nobody’s been and that is so exciting. Here I am at the ripe old age of 71 and I’m addicted to making discoveries through assessment data. What a weird thing for a human being to be addicted to!”

Despite his own interest in the subject, Dirlam has ultimately come to Virginia Wesleyan to build on the reliability of the College’s existing assessment tools, to provide a successful accreditation experience and to help faculty, staff and students gain a better understanding, as he says, “about what other people know that they don’t know.”

His passion for knowledge, education and people is contagious. When asked if there’s a secret to his happiness, Dirlam’s wide-eyed enthusiasm and sense of humor come through as he responds:

“You gotta love life and all things living.” Pausing, he adds: “Except for mosquiters.”