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Review of Kevin Pugh's Book Computers, Cockroaches and Ecosystems: Understanding Learning through Metaphor

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Abstract

This review summarizes the major concepts presented in Kevin Pugh's 2017 book, *Computers, Cockroaches and Ecosystems: Understanding Learning through Metaphor.* In addition to summarizing the major concepts Pugh presents, this review also provides a brief critique of the book and suggests various audiences that are likely to find the content relevant, informative, and interesting.

Fueled by his own "disastrous student teaching experience" and the realization that he failed to learn anything about the process of learning during his teacher education program, author Kevin Pugh seeks to popularize some of the core principles of learning in his book *Computers, Cockroaches and Ecosystems: Understanding Learning through Metaphor.* Pugh is a professor in the School of Psychological Sciences at the University of Northern Colorado who holds a Ph.D. in Educational Psychology from Michigan State University and a B.S. in Psychology from Brigham Young University. In *Computers, Cockroaches and Ecosystems: Understanding Learning through Metaphor*, Pugh's goal is to present and expand upon metaphors related to five major learning perspectives and "spark musings about the meaning and ramifications of each core metaphor" (Pugh, 2017,p. 5). Each chapter presents a different metaphor and unpacks its meaning through a variety of real-world accounts and stories (including a handful of tales related to Pugh's obsession with fishing). Pugh also discusses the implications for learning and teaching for each metaphor. He credits "dry, over-stuffed textbooks" as the inspiration for this book and sees *Computers, Cockroaches and Ecosystems: Understanding Learning through Metaphor* as an opportunity to show that learning about learning doesn't have to be painful (Pugh, n.d).

While the book was written to appeal to a broad audience including students, parents, counselors, and military or business trainers, Pugh intended it primarily for teachers since they are at the "forefront of the learning challenge" and must not only foster learning, but also prepare individuals for this leaning age (Pugh, 2017, p. 3). Pugh asserts that understanding the true nature of learning is critical to teachers' success and to our success as a learning society. As an Instructional Support Specialist who holds a Ph.D. in Education, I found the book particularly relevant in my work with adjunct faculty members who are new to teaching and want to learn more about the nature of learning.

Making Sense of the Metaphors: Key Points of the Author

The learning perspectives Pugh addresses in *Computers, Cockroaches and Ecosystems: Understanding Learning through Metaphor* include Behaviorism, Cognitivism, Constructivism, Socioculturalism, and John Dewey's philosophy of education. With his light-hearted, humorous, and easy to read style, Pugh introduces metaphors for each learning perspective and presents a series of stories and examples to enhance readers' understanding of each.

Learning as Natural Selection is the metaphor Pugh presents to help explain Behaviorism, describing the study of learning as a study of the linkages between behavior and environment. Drawing on work from B.F. Skinner and sharing the classic illustration of the coloring shifts of the peppered moth population in England during the Industrial Revolution, Pugh explains how we learn through positive reinforcement of correct or desirable responses.

Mind as a Computer and *Mind as a Network* support the Information Processing Model of Memory and are the metaphors Pugh uses to help explain Cognitivism. Pugh explores the computer as a foundational metaphor for

conceptualizing the mind, explaining how the mind processes information through encoding, processing, storing (both short term and long term), and retrieval.

Computer as Mind and *Mind as Ecosystem* are the metaphors that Pugh uses to help explain Constructivism. These metaphors illustrate how we construct meaning based on existing ideas and how we *reconstruct* memories rather than retrieve/recall them like a computer. The *Mind as Ecosystem* metaphor also speaks to the ways in which the mind can be viewed as an interconnected and dynamic system of ideas that kills off, assimilates, or accommodates new ideas as they are presented.

Mind as Cultural Tools and *Learning as a Cockroach or Panda Bear* are the metaphors that Pugh uses to help explain Socioculturalism and the importance of social and cultural factors in the learning process. The *Mind as Cultural Tool* metaphor suggests that learning is a process of enculturation and that knowledge acquisition is the result of effectively leveraging existing mental tools of our culture (such as language), not simply a product of innate intelligence.

The metaphor *Learning as a Cockroach or Panda Bear* compares two competing perspectives on learning. The first likens learning to a cockroach, an adaptive creature that can live in a variety of environments ranging from the Amazon jungle to the space under your refrigerator. If learning is like a cockroach, learned skills and knowledge can exist apart from a specific learning environment and can easily be applied across a variety of contexts. If learning is like a Panda Bear, the converse is true. To understand the Panda, one needs intimate knowledge of the environment-specific factors that are critical to his survival such as elevation (Pandas only survive in mountain ranges between 1,600 and 3,200 meters high) and habitat acreage. The *Learning as a Panda Bear* perspective suggests in order to understand learning, one has to study it within its complete social, cultural, and situational context, just like Pandas can best be understood within the bamboo forest environments where the live in China's central mountains.

Learning as the Journey versus the Map and *Learning as Art* are the two final metaphors Pugh addresses. Rather than illustrating a specific learning perspective, these metaphors address the purpose of learning and provide insight regarding John Dewey's philosophy of education. *Learning as the Journey versus the Map* positions school curriculum as a guide for a learning journey. While it can provide structure and organization, the map is not a substitute for one's own individual experience/journey. Pugh's final metaphor, *Learning as Art,* emphasizes the importance of surrendering to the experience of learning in order to move from a focus on performance (which is judged by others) to a focus on mastery (which inspires a sense of ownership for one's learning). The *Learning as Art* metaphoralso underscores the importance of teachers' artistic crafting of content in order to evoke a particular type of learning experience in their students.

Critique

Overall, *Computers, Cockroaches and Ecosystems: Understanding Learning through Metaphor* is an interesting, informative and enjoyable read. One of the strengths of the book is the accessible way in which Pugh presents scholarly ideas that are often perceived as dry or esoteric. Although each chapter includes an extensive list of

academic references, the content remains accessible to novices and lay audiences who may not be familiar with learning theory. With his conversational tone, humor, and numerous examples and stories, Pugh's intent to write for "anyone with an interest in learning" (Pugh, 2017, p. 3) is evident. The structure and organization of the book make it easy to read, and the chapters flow in a logical, easy-to-read format. Another strength of the book is the quality of the metaphors themselves. Although some metaphors will likely resonate more strongly with some readers than others, Pugh successfully connects each metaphor to its respective learning perspective and explains how the metaphor can be used to enhance understanding of the presented material.

While *Computers, Cockroaches and Ecosystems: Understanding Learning through Metaphor* is an interesting, informative and enjoyable read that addresses a variety of learning perspectives, it would have been interesting for Pugh to include metaphors for a few additional learning perspectives, such as motivation and humanist theories of learning. With increasing numbers of non-traditional students in post-secondary education and projections that enrollment of students aged 24-29 will increase at a faster rate than traditional-aged students through 2020 (Hussar & Bailey, 2011), it would also have been interesting for Pugh to include metaphors that specifically address adult learning theory.

Conclusion

Overall, Pugh is successful in his goal of helping readers better understand various perspectives on the teaching and learning process. *Computers, Cockroaches and Ecosystems: Understanding Learning through Metaphor* is a valuable resource for a variety of audiences, but especially for teachers since it has the potential to inspire new ways of thinking about teaching and helping prepare students for success in what Pugh calls the "learning age." Although not explicitly mentioned as an intended audience, Pugh's work is also valuable for instructional designers and instructional technologists since they, too, can benefit from a deeper understanding of various scholarly perspectives regarding the learning process as they attempt to design high-quality learning experiences that honor true nature of learning.

References

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