

**Problems as Possibilities:  
Problem-Based Learning for K–16 Education**

**2nd Edition**

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# INTRODUCTION TO THE 2ND EDITION

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We can't put it together. It is together.

—S. Brand, *The Last Whole Earth Catalog* (1971)

WHETHER THINKING ABOUT THE UNIVERSE, THE AMBIGUITIES of life, or the wonders of learning, educators realize that the whole is so much more than any collection of parts. As they work with learners of all ages, educators constantly strive to create holistic and connected experiences that enable students to tackle the complexities facing them as citizens in a global community, as well as in everyday situations. These experiences should reveal a need to be open-minded and adaptable and should consider the interrelatedness of systems, both natural and contrived.

We journey through life encountering, grappling with, and resolving problems that present powerful opportunities for learning. Ask people to

describe a time in their lives when they really learned something that they remember today with understanding. Most people will not recall a formal educational experience. They will, however, relate struggling with a problem such as dealing with the death of a parent. *What needs to be done? Who needs to know? How will we cope with the news? Is there an estate or mounting liabilities? What are the legal issues?* These types of questions beg consideration and a balanced response.

Messy, ill-structured problems capture our attention and draw us into their depths. They focus our investigation and thinking, bringing us closer and closer to comprehension and resolution. These problems present holistic learning experiences. They expose and connect rich content and essential skills. They catalyze critical and creative thinking, and they place us in situations that demand decisions based upon sound criteria, taking into account conflicting interests and incomplete information. We're talking, of course, about problem-based learning—where the problem comes first and learning is fueled through the problem's investigation and resolution.

Since 1992 the Center for Problem-Based Learning at the Illinois Mathematics and Science Academy (IMSA) has investigated and applied the principles of problem-based learning (PBL). Our work there has described how problem-based learning is applied in elementary, middle, and high school settings. We have measured the effects of defined aspects of a problem-based approach, and we have shared our experience and learning with educators across the country. In 1998 the Center for Problem-Based Learn-

ing became an integral part of the Center for the Advancement and Renewal of Learning and Teaching: The Center @ IMSA. (See the Appendix for more information.)

This book is a natural extension of the work at IMSA. But how do we represent a dynamic concept like problem-based learning in a way that enables understanding and encourages application? What can we relate on the static pages of a book that would meet the needs of a diverse group of learners?

In thinking through our problem as authors, we heard clearly the voices of educators with whom we have worked. Their needs were as diverse as their interests. Some were captivated by stories of real classroom experiences. "What happened? Why were the students intrigued by the problem?" Others wanted to know about problem-based learning. "Where did PBL come from? How does it relate to other ideas about teaching and learning that are part of the educational scene?" Many desired to become involved from the inside and design their own problem-based units. "Where do I begin to create my own PBL curriculum? How do I coach the learning process?" Today's reality of local, state, and national standards complicates these issues. "How can I fairly and adequately assess learning targeted by and acquired through problem-based learning experiences?" We've found that each of these approaches to teaching about problem-based learning has value for the reader.

Our book offers opportunities to learn about PBL from multiple perspectives. The diverse members of our audience will find strong connections to their own classroom experience while reading about problem-based learning.

For people who want to experience PBL, Chapter 1 provides anecdotal reports of teachers and students. Vignettes from several grade levels and contexts enable readers to see PBL's possibilities. This second edition includes examples from universities, as well as elementary and secondary education (thus, as the title of this book indicates, PBL can apply to kindergarten through "grade" 16, or college level).

For readers who want to learn more about the theory behind this approach to education, Chapter 2 provides an overview of problem-based learning, and Chapter 3 presents background information. We hope these chapters supply answers for those who need to know what PBL is and where it comes from.

When you're ready to try designing and implementing PBL, Chapters 4, 5, and 6 show you how to play with an idea and make it your own. These chapters present practical information to enable educators to create and develop PBL curriculum and plan for instruction in a PBL classroom.

Chapter 7 adds to our understanding of assessment in and through PBL. This chapter presents the grounding for the assessment of PBL experiences guided and supported by a standards-based approach—one that recognizes individual accountability for learning and demonstrating proficiency much the same way as a musician performs or an

athlete competes. Some day we all have to suit up and step onto the playing field. After our students graduate or drop out, it's too late for the guided practice they deserve.

For educators who need to know the "whys" to find their way through an idea, Chapter 8 offers answers, building a solid foundation for PBL as a valuable innovation for today's learners and opening the door to the process of becoming a teacher of PBL.

Different pathways through these chapters help serve the needs of different learners:

- If you are intrigued by context and how ideas play themselves out in authentic settings, begin with Chapter 1.
- If you want to know the origins and the grounding of ideas, begin with Chapter 2, 3, or 8.
- And if you must roll up your sleeves and become immersed immediately in the "how" of things, begin with Chapter 4, 5, 6, or 7.

Wherever you begin (see Figure I.1), make sure you read the whole book to experience all the aspects of problem-based learning as a natural integrating focus for relevant curriculum and meaningful student learning.