March 2005

Under Review: The Wright Way: Seven Problem-Solving Principles From the Wright Brothers That Can Make Your Business Soar

Thomas E. Kraft
University of Nebraska-Lincoln

Follow this and additional works at: https://ir.library.illinoisstate.edu/jste

The Wright Way: Seven Problem-Solving Principles from the Wright Brothers That Can Make Your Business Soar
By Mark Eppler
Format: Hardcover, 205 pp. ISBN: 0-8144-0797-8
Publisher: AMACOM

Reviewed by
Thomas E. Kraft
University of Nebraska-Lincoln

I have yet to read something about the Wright brothers that is not interesting as well as instructive. Mark Eppler's *The Wright Way* (2004) is a book as much about invention and problem solving in technology as it is about business. As a former military aviator myself, a study of the Wright brothers strikes in me a particularly responsive chord. As an instructor in technology education, that chord continues to resonate because of the Wrights' hands-on, minds-on problem solving abilities.

Eppler introduces this book with a brief review of heavier-than-air manned flight at the turn of the twentieth century. At that time, a number of key players were pursuing the problem of manned flight and, as good students, the Wright brothers studied the work and results of these other inventors. Additionally, Eppler briefly profiles the personalities of these two men. He indicates that it was not Orville and Wilbur Wright individually who invented the airplane, but the Wright brothers as an entity. There is much to be said about how their combined talents complemented each other, and if not for this symbiosis, it is unlikely they would have succeeded. The author concludes his introduction with a list of skills, both mechanical and conceptual, that define the problem solving abilities of the Wright brothers. Explanations of this set of skills comprise the core of the text and delineate a problem solving model Eppler calls *The Wright Way*.

_____

Kraft is Lecturer/Coordinator for Industrial Technology Education at the University of Nebraska-Lincoln. Kraft can be reached at tkraft2@unl.edu.

On December 8, 1903 an editorial in *The New York Times* predicted that manned flight was achievable, but only if scientists and mathematicians worked on it around-the-clock for the next "one to ten million years." Less than ten days later, on December 17 at the sand dunes called Kill Devil Hills near Kitty Hawk, North Carolina, the Wright brothers made their first flights. Eppler says, "It would be like Neil Armstrong landing on the moon in a craft he had built himself and paid for with a part-time job" (p 15). With the exception of the engine, built by a mechanic who worked for the Wright brothers, Orville and Wilbur Wright designed and built their own aircraft as well as taught themselves to fly. There is little doubt today that the Wright brothers discovered the secrets of heavier-than-air manned flight. There is even less doubt regarding the enormous impact this technology has had on society. The author defines the Wrights' achievement as the event of the century, and as a result he developed seven problem solving principles based on the Wright brothers' approach to inventing the airplane. These principles include forging, the principle of constructive conflict; tackling the tyrant, the principle of worst things first; fiddling, the principle of inveterate tinkering; mind-warping, the principle of rigid flexibility; relentless preparation, the principle of forever learning; measuring twice, the principle of methodical meticulousness; and force multiplication, the principle of equitable teamwork. These principles are each given a chapter in the book for further explanation.

Before reviewing the seven principles, Eppler provides additional historical background on the Wright brothers in the second chapter. The hook for this chapter is a common question that has intrigued writers and historians regarding the Wright brothers: Why was it that Wilbur and Orville Wright, two bicycle makers with little formal training, succeeded where many formally trained experimenters failed? There are many pieces to this puzzle. Part of the answer is found in their upbringing in a rich family environment. Another part is the inventive spirit that existed in Dayton, Ohio where the Wright brothers lived and worked. By 1900, Dayton ranked first in the U.S. for patents secured per capita. Also, there was the Wright brothers' bicycle

expertise and their understanding of balance and control which they applied to the airplane. According to Jakab, "One of the primary breakthroughs the Wrights made was the realization that a positive means of controlling, or balancing, an aircraft must be devised before any significant progress on the flying machine could be made" (1990, p.9). These explanations just begin to answer the question of why Wilbur and Orville Wright. The rest of this book provides more to understanding their collective genius.

Chapter 3, "Forging, the Principle of Constructive Conflict," describes a refreshing strategy for settling disputes in these days of political correctness. The Wright brothers often engaged in heated debates to hammer out new ideas or to solve problems. They would argue so intensely that it would surprise those who might be passing by or sitting in the next room. The Wright brothers called this "scrapping," and it served as an effective way of tossing ideas back and forth as well as a means of forging new ones. Eppler indicates that "the best companies, rather than avoiding conflict, embrace it. They see it as a vital energy source that fuels everything from new product ideas to the marketing strategies that sell them" (p.59). It is important to note that this worked for the Wright brothers because of the deep mutual respect and trust they shared with each other. It was as an effective problem solving tool for them. However, today many organizations exist in a climate that avoids confrontation for purposes of consensus and unity. In these cases, Eppler provides a number of "things to consider" before forging ahead with this principle.

To find the solution to heavier than air flight, the Wright brothers needed to identify a number of subsets within the overall problem. The subsets included wing design, propulsion and power, balance and control, and flying skill. Many of the experimenters who preceded the Wright brothers focused on power and propulsion and neglected balance and control. As mentioned earlier, the Wrights identified balance and control as the initial problem they needed to solve before the others. Eppler calls this "Tackling the Tyrant, the Principle of Worst Things First." In short, "It's that part of the problem that, if left unsolved, will prevent solution of the whole" (p.71). Chapter 4

outlines ways for identifying the "tyrant" and then working this part of the problem first.

"Fiddling, The Principle of Inveterate Tinkering" is hands-on as well as minds-on. It includes tactile, conceptual, and hybrid tinkering. Tactile tinkering is the act of working hands-on with something with an eye to figuring it out or improving upon it. Conceptual tinkering is a creative process that takes place in the mind's eye. And hybrid tinkering concerns "merging the senses (seeing, feeling, touching, smelling) with the imagination to create new possibilities and connections" (p.90). The Wright brothers habitually tinkered as a means of looking for connections, comparisons, and contrasts. According to Crouch, "It is clear that they had a considerable local reputation for solving standard mechanical problems in unconventional ways" (1992, p.85). Eppler sees this form of problem solving as a lost art, but argues that this art should be part of every company's problem solving strategy. In this chapter, the author provides tips to make this process effective in an organization.

Wing warping is a concept the Wright brothers used to twist the wings of an airplane so that it would turn or roll in flight. Wilbur first developed this idea from observing the box of a bicycle inner tube when it was manipulated by hand. The Wright brothers were creative thinkers who were able to think outside the box. Eppler describes "Mind Warping, the Principle of Rigid Flexibility" as the ability to slip between the abstract and concrete in order to solve problems. Here, he provides several tips for individuals as well as organizations to apply this concept.

Three additional principles are outlined in chapters 7 to 9 to include "Relentless Preparation," "Measure Twice," and "Force Multiplication." Briefly, "Relentless Preparation, the Principle of Forever Learning" means the more information you have about a problem the better you can understand and define it. "Measure Twice, the Principle of Methodical Meticulousness" is exemplified by the records kept by the Wright brothers. "They knew exactly what they did. They knew exactly when they did it. They knew how they did it. They knew why they did it" (p.149). And "Force Multiplication, the Principle of Team Equity" applies to people with a common goal who are "powered by team equity: trust, effort, profits, power, and honor" (p.151). In a business sense

these principles make for strong, competitive organizations or companies.

The last chapter, "Souls on Fire," and the epilogue, "Lives of Consequence," conclude with the theme of passion. Eppler indicates that "without the passion and vision, the wind beneath their wings, the Wright brothers might never have driven their ideas to a successful conclusion" (p.174). The combination of this passion and their problem solving legacy resulted in a technological innovation that changed the world. The author believes this combination is what is needed to make a business soar. However, the problem solving principles Eppler outlines have an application that goes beyond business and overlaps with education, particularly technology education. A study of the Wright brothers and their systematic minds provides a never ending array of stories and examples that address numerous standards and benchmarks in technology education. Eppler has written this book as a guide to enhance business, but applying these same problem solving principles to an educational setting brings excellence to outcomes. How could you go wrong? It's *The Wright Way*.

References

Crouch, T.D. (1992). Why Wilbur and Orville? Some thoughts on the Wright brothers and the process of invention. In R.J. Weber and D.N. Perkins (Eds.), *Inventive Minds* (pp. 80-92). Oxford University Press.

Jakab, P.L. (1990). *Visions of a flying machine: The Wright brothers and the process of invention*. Smithsonian Institution Press.