

Theory of Knowledge

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Theory of Knowledge

- How do we know what we know?
- The importance of theory
- Hierarchy of knowledge
- Human Performance connection

*Quotations in this section are from
The New Economics by Dr. Deming*

*and the Human Performance Improvement Strategic Plan for DOE Richland
Operations Office*

How Do We Know What We Know?

- **How does a child know not to touch a hot stove burner?**
 - Told by parents?
 - Direct experience?
- **The child formulates a theory – the stove burner may be hot, hot things hurt**
- **The child predicts that if the stove burner is touched, there will be a bad outcome.**

Ref. “Mind and the World Order” C.I. Lewis 1929

Examples and Theories

- **No number of examples proves a theory**
- **One negative example disproves a theory**
- **“There is no knowledge without theory”**
- **We modify our theories based upon observation and experience**
- **“Without theory there is nothing to revise, nothing to learn”**

Theory, Prediction, and Copying

- **“Theory is a window into the world. Theory leads to prediction. Without prediction, experience and examples teach nothing. To copy an example of success, without understanding it with the aid of theory, may lead to disaster.”**

What is the implication for benchmarking, site visits, “lessons learned”, “best practices”?

No True Value

- **“There is no true value of any characteristic, state, or condition that is defined in terms of measurement or observation.”**
- **Yes, I can list the prime numbers from 2 to 100, by definition, but this is information, not knowledge.**
- **Get the facts! Management by Fact! What do these exhortations mean?**
- **Any measure can be changed by modifying the context in which it was collected.**

Knowledge Hierarchy

- **Data: symbols, counts, numbers**
- **Information: data that are processed to be useful; provides answers to "who", "what", "where", and "when" questions**
- **Knowledge: application of data and information; answers "how" questions**
- **Understanding: appreciation of "why"**
- **Wisdom: evaluated understanding.**

<http://www.systems-thinking.org/dikw/dikw.htm>

Human Performance Initiative

- **“Human performance” refers to the system of processes, influences, and behaviors, as well as their ultimate results that eventually become manifest in the workplace. This definition contrasts with the more traditional belief that human performance is simply a worker-focused phenomenon. This systemic perspective requires consideration of management, staff, supervision, and workers as a team that works together rather than in opposition in achieving the mission of the site-safely, reliably, and efficiently.**

– Human Performance Improvement Strategic Plan for DOE Richland Operations Office

Human Error

- **Errors can be reduced but not eliminated**
- **“Specific active errors during particular tasks are predictable and therefore preventable”**
- **We can reduce the frequency of error, and also work to reduce the impact of the inevitable errors**
- **HPI recognizes that organizational weaknesses and latent errors within our systems often drive the course of events within the workplace that lead to reportable events, injuries, and unfavorable outcomes.**

HPI and System of Profound Knowledge

- **Some commonalities to note:**
 - Systems
 - Prediction
 - Context of a worker's actions
 - Driven by theory
 - Management responsibilities
 - Culture, values, beliefs, habits (psychology)