

Brainstorms and Lightning Bolts: Thinking Skills for the 21st Century

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These are a few activity sheets from the book, *Brainstorms and Lightning Bolts: Thinking Skills for the 21st Century*, by David Thornburg, Ph.D. This book can be ordered from the Thornburg Center, (650) 508-0314, or by e-mail at TCPD2020@aol.com. Price: \$25, postpaid (in continental US).

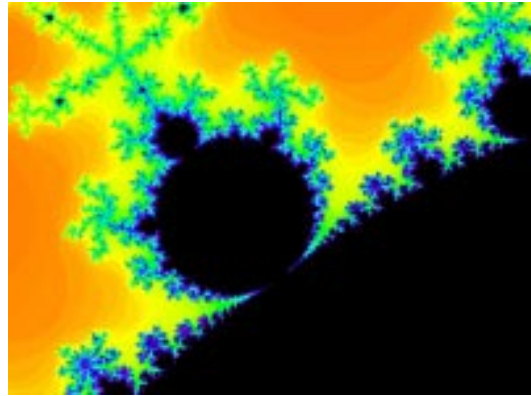
For information regarding Dr. Thornburg and this or other workshops, please contact David at dthornburg@aol.com, or visit the Thornburg Center Web site at <http://www.tcpd.org>.

Thinking About the Future: In the space below, make a list of what it will mean to be an educated person in the 21st century.

Linear and Chaotic Time: In the columns under each picture, make a list of practices in your organization that are reflective of the linear model of time, and then list alternative practices that reflect the chaotic model of time.



Linear model of time

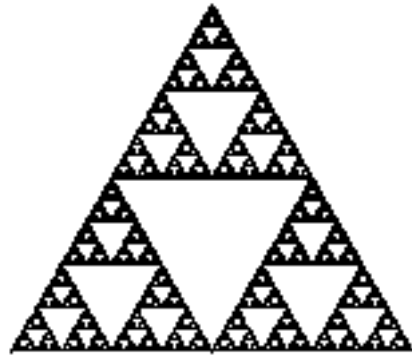


Chaotic model of time

Butterflies and Strange Attractors: In the columns under each picture, make examples of “butterfly effects” and “strange attractors” relevant to your organization or field of expertise.



Butterfly Effects



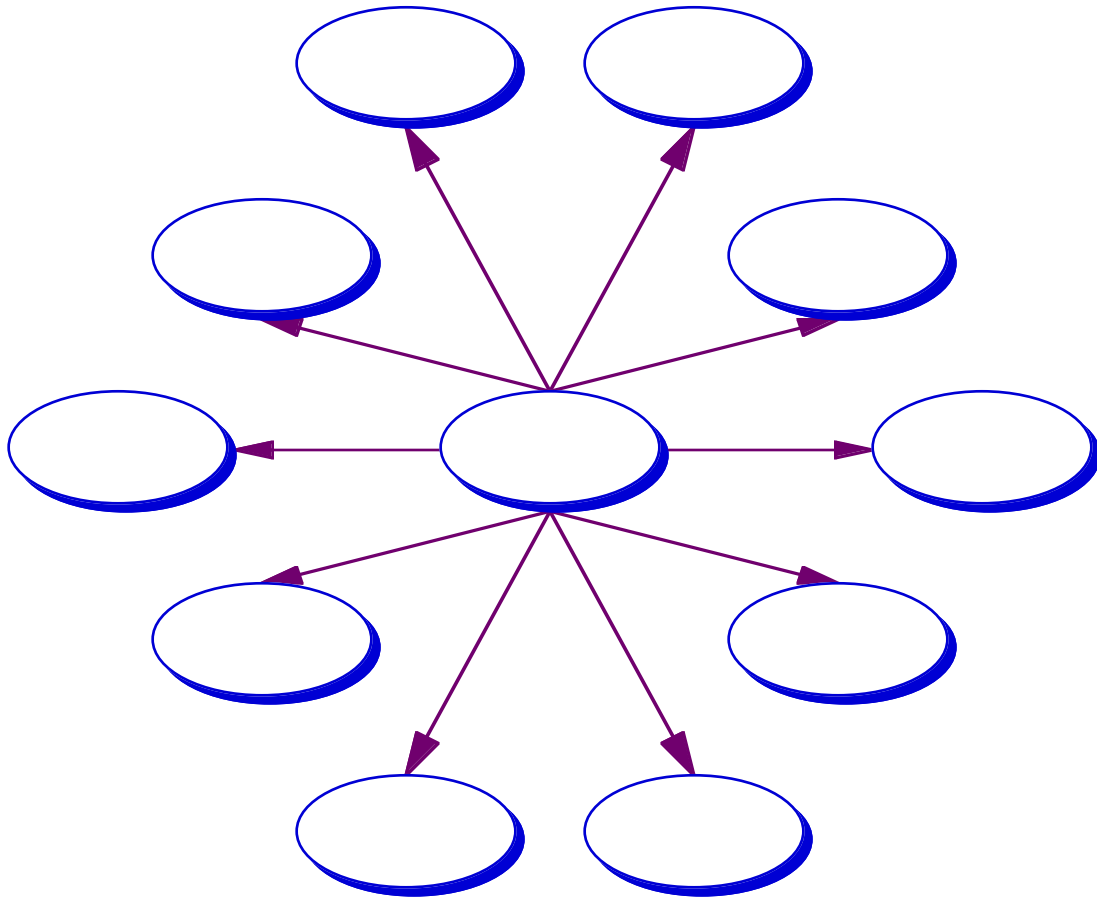
Strange Attractors

Verbs and Nouns: Make a list of the major “nouns” of your profession (the bodies of factual information you rely on a daily basis) and, in the next column, make a list of the process skills you use in your job. Which column describes your greatest value to your organization? Do you think your answer would have been different if the question had been asked about your profession twenty years ago?

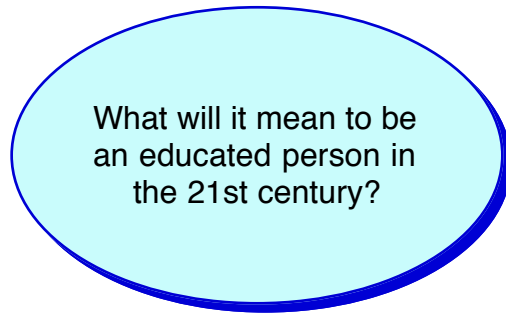
Nouns (the stuff you know)

Verbs (the processes you know)

Warming Up: Idea mapping warm-up — write the word “Table” in the central oval, then write the next ten words that pop into your mind in the surrounding ovals. Do this as quickly as possible.



Idea Mapping: Create an idea map with your ideas on what it will mean to be an educated person in the 21st century.



Concept Mapping: Create a concept map on the use of technology in education. (Remember that nouns go in boxes or ovals, and verbs go on the lines connecting these nouns).

Identifying systems: All systems have these five components:

1. A system's parts must all be present for the system to carry out its purpose optimally.
2. A system's parts must be arranged in a specific way for the system to carry out its purpose.
3. Systems have specific purposes within larger systems.
4. Systems maintain their stability through fluctuations and adjustments.
5. Systems have feedback.

Using these criteria, determine which of the following are "systems," and explain why or why not.

- A. A heater with a thermostat in a house
- B. A refrigerator
- C. A third-grade class
- D. Your car
- E. The task of painting a house
- F. The creation of a new company
- G. Growing a rose garden
- H. Driving to work
- I. Windows '95
- J. Being in love

Causal Loops: examine a recent event that had an impact on your business or organization.

- A. What was the event, and how did you react to it?
- B. Create a graph of the processes your organization was going through over time as it related to the event, with special focus on things that were going on prior to the event itself.
- C. Based on insights you may have obtained from this process analysis, create a causal loop diagram describing the processes you observed, or new processes you might implement to resolve the issue over the long-term.

Software

Most the following software is available both for the Apple Macintosh and Windows '95 as well. Some titles are for only one platform (Macintosh, Windows '95, or Silicon Graphics UNIX) at the time this book was written. Demo versions of most of the titles could be downloaded for free from the listed Web sites.

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| AOLPress | (http://www.aolpress.com) |
| CMap | (http://www2.ucsc.edu/mlrg/mlrgtools.html) |
| Stagecast Creator™ | (http://www.stagecast.com) |
| Inspiration | (http://www.inspiration.com) |
| LifeMap | (http://www2.ucsc.edu/mlrg/mlrgtools.html) |
| Model-It | (http://www.cogitomedia.com) |
| SPIRIX | (http://www.thememedia.com) |
| StarLogo | (http://www.media.mit.edu/~starlogo) |
| Stella | (http://www.hps.com) |
| VisualInsights | (http://www.visualinsights.com) |
| Xcize | (http://www.brosisii.com) |

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