

Doing Based Learning Definitions

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The Learn Better by Doing Study was conducted by Dr. William E. Dugger, Dr. Kendall N. Starkweather, and Dr. Johnny Moyer.

Activity: Something that is done as work or for a particular purpose.

Build: To make something by joining materials or components together into a composite whole.

Complex System: A system consisting of interconnected or interwoven parts that interact in such a way as to produce a global output that cannot always be predicted.

Constraint: A limit to the design process. Constraints may be such things as appearance, funding, space, materials, and human capabilities.

Criteria: A desired specification (element or feature) of a product or system.

Data: Raw facts and figures that can be used to draw a conclusion.

Design: A decision-making process that produces plans by which resources are converted into products or systems that meet human needs and wants or to solve problems.

Design Problem: One must define the existing problem (design problem) before he or she applies the Design Process to resolve that problem.

Design Process: A systematic problem-solving strategy, with criteria and constraints, used to develop many possible solutions to solve a problem or satisfy human needs and wants and to winnow (narrow) down the possible solutions to one final choice.

Doing: A tactile/hands-on process of problem solving starting with human needs and wants that leads to the principles of innovation such as designing, making/building, producing, and evaluating.

Doing Based Learning: Reasoning and learning by completing activities that address and solve a problem. Performing Doing Based Learning is more than merely completing a project or an activity; it requires the learner to use his or her mind and hands to solve a simulated or real problem.

Engineering: The profession of or work performed by an engineer. Engineering involves the knowledge of the mathematical and natural sciences (biological and physical) gained by study, experience, and practice that are applied with judgment and creativity to develop ways to utilize the materials and forces of nature for the benefit of humankind.

Engineering Design: The systematic and creative application of scientific and mathematical principles to practical ends such as the design, manufacture, and operation of efficient and economical structures, machines, processes, and systems.

Experiment: An act of conducting a controlled test or investigation. Trying out new procedures, ideas, or activities.

Instruments: Tools or devices used for a particular purpose.

Knowledge: The fact or condition of knowing something with familiarity gained through experience or association, an acquaintance with or understanding of a science, art, or technique.

Make: To create something or bring into being by forming, shaping, or altering material.

Model: A visual, mathematical, or three-dimensional representation in detail of an object or design, often smaller than the original. A model is often used to test ideas, make changes to a design, and to learn more about what would happen to a similar, real object.

Modeling and Simulation: Getting information about how something will behave without actually testing it in real life.

Process: Human activities used to create, invent, design, transform, produce, control, maintain, and use products or systems.

Product: A tangible artifact produced by means of either human or mechanical work, or by biological or chemical processes.

Prototype: A full-scale working model used to test a design concept by making actual observations and necessary adjustments.

Requirements: The parameters placed on the development of a product or system. Requirements could include safety needs, physical laws that limit development of an idea, the available resources, the cultural norms, and the use of criteria and constraints.

Resource: The things needed to get a job done. In a technological system, the basic technological resources are: energy, capital, information, machines and tools, materials, people, and time.

Science: The study of the natural world through observation, identification, description, experimental investigation, and theoretical explanations.

Scientific Inquiry: The use of questioning and close examination using the methodology of science.

Scientific Knowledge: Knowledge accumulated by systematic study and organized by general principles.

Simulation: The imitation of the operation of a real-world process or system.

Solution: The successful action of solving a problem.

System: A group of interacting, interrelated, or interdependent elements or parts that function together as a whole to accomplish a goal.

Technology: Technology is the modification of the natural world to meet human wants and needs.

Tool: A device that is used by humans to complete a task.