

From Data to Wisdom Russell Ackoff¹

An ounce of information is worth a pound of data.

An ounce of knowledge is worth a pound of information.

An ounce of understanding is worth a pound of knowledge.

Most of the time spent in school is devoted to the transmission of information and ways of obtaining it. Less time is devoted to the transmission of knowledge and ways of obtaining it (*analytic thinking*). Virtually no time is spent in transmitting understanding or ways of obtaining it (*synthetic thinking*). Furthermore, the distinction between data, information, and so on up to wisdom are seldom made in the educational process, leaving students unaware of their ignorance. They not only don't know, they don't know what they don't know.

...

Data are symbols that represent the properties of objects and events. Information consists of processed data, the processing directed at increasing its usefulness. For example, census takers collect data. The Bureau of the Census processes that data, converting it into information that is presented in the numerous tables published in the *Statistical Abstracts*. Like data, information also represents the properties of objects and events, but it does so more compactly and usefully than data. The difference between data and information is functional, not structural.

Information is contained in *descriptions*, answers to questions that begin with such words as who, what, when, where, and how many. *Knowledge* is conveyed by instructions, answers to how-to questions. *Understanding* is conveyed by explanations, answers to why questions.

Information, knowledge, and understanding enable us to increase efficiency, not effectiveness. The efficiency of behavior or an act is measured relative to an objective by determining either the amount of resources required to obtain that objective with a specified probability, or the probability of obtaining that objective with a specified amount of resources. The value of the objective(s) pursued is not relevant in determining efficiency, but it is relevant in determining effectiveness. *Effectiveness is evaluated efficiency*. It is efficiency multiplied by value, efficiency for a valued outcome.

Intelligence is the ability to increase efficiency; wisdom is the ability to increase effectiveness.

The difference between efficiency and effectiveness—that which differentiates wisdom from understanding, knowledge, information, and data—is reflected in the difference between development and growth. Growth does not require an increase in value; development does. Therefore, development requires an increase in wisdom as well as understanding, knowledge, and information.

Wisdom deals with values. It involves the exercise of judgment. Evaluations of efficiency are all based on a logic that, in principle, can be programmed into a computer and automated. These evaluative principles are impersonal. We can speak of the efficiency of an act independently of the actor. Not so for effectiveness. A judgment of the value of an act is never independent of the judge, and seldom is the same for two judges.

From all this I infer that although we are able to develop computerized information-, knowledge-, and understanding-generating systems, we will never be able to generate wisdom by such systems. It may well be that wisdom—which is essential for the pursuit of ideals or ultimately valued ends—is the characteristic that differentiates man from machines. For this reason, if no other, the educational process should allocate as much time to the development and exercise of wisdom as it does to the development and exercise of intelligence.

Not only does schooling do little or nothing about the generation of understanding and the development of wisdom, it does little about even the collection of data and the generation of information. There are great subtleties involved in the collection of data and its conversion into information. Most of these subtleties are not revealed in the education process. Most of us have to learn them the hard way.

¹Ackoff, R. L. (1999) *Ackoff's Best*. New York: John Wiley & Sons, pp 170 – 172.