2010

What is technology? A Learning Module

José Anazagasty-Rodríguez
Departamento de Ciencias Sociales
10/21/2010

How much do you know?

Answer the following:

When social scientists talk about any system that uses knowledge and organization to produce objects for the attainment of specific goals they are referring to:

a. Science
b. Culture
c. Technology
d. Society

Expected learning outcomes

After completing the learning module participants will be able to recognize, identify and define technology.

What is technology?

The term technology is often used to refer to tools, machines and equipment, including computers and like devices. Sociologists, however, use a broader definition that includes social relationships dictated by the technical organization and mechanization of activities, for example, the technical organization of work (Oxford Dictionary of Sociology 2005).

Technology is often defined as tools, machines, equipment, and devices that aid humans in numerous activities, especially work. But for students of technology, including sociologists, historians and philosophers, technology is more than just a collection of apparatuses. For them, defining technology as gadgets, devices and machines is rather tendentious.

For Andrew Feenberg (1995: 8), for instance, technology "cannot longer be considered as a collection of devices, or more generally, as the sum of rational means. These are biased definitions that make technology appear more functional and less social than in fact it is." From his perspective technology cannot be reduced to material artifacts nor can it be defined merely in terms of its functionality or its rationality. Furthermore, technology is inherently social; it is social all the way down. The social and the cultural are deeply enmeshed in scientific and technological practices and as a result on technologies themselves. Put differently, technology is determined in its meaning and normative content, not by technical rationality alone, but by the socio-cultural world in which it is embedded and which is entrenched in the technology itself.

> "The social and the cultural are deeply enmeshed in scientific and technological practices and as a result on technologies themselves."
> Andrew Feenberg

Wiebe E. Bijker (1992: 75) also discards traditional accounts and definitions of technology:

Technology is assumed to be designed, developed, and produced by engineers. They are at the drawing boards and behind the laboratory benches; they apply for patents, model the prototype, and test in the pilot plant; they show the newly born artifact to the press and, if lucky, they figure prominently in the glossy photographs of stories about heroic inventors. Once these engineers have produced the technology, it is passed on to the sales people, the managers, the

trade, and, finally, to the users. Engineers design technology, managers produce it, salespeople sell it, trades people distribute it, users use it. Alas, this neat and orderly image of technical development, so pervasive in all but the most recent technology studies, is not only too simple--it is wrong.

"Engineers design technology, managers produce it, salespeople sell it, trades people distribute it, users use it. Alas, this neat and orderly image of technical development, so pervasive in all but the most recent technology studies, is not only too simple--it is wrong."

Wiebe E. Bijker

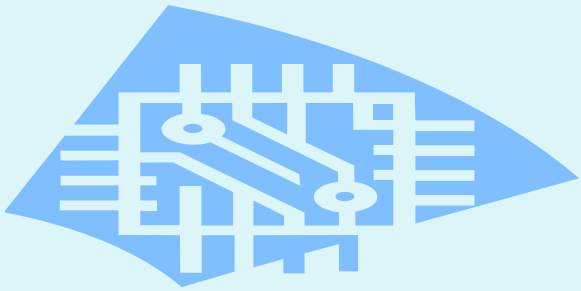
Also stressing the social origins and character of technology Bijker and Law (1992: 11) state that:

Technology does not spring, *ab initio*, from some disinterested fount of innovation. Rather it is born of the social, the economic and the technical relations that are already in place. A product of the existing structure of opportunities and constraints, it extends, shapes, reworks, or reproduces that structure in ways that are more or less unpredictable. And, in so doing, it distributes, or redistributes, opportunities and constraints equally or unequally, fairly or unfairly.

"Technology does not spring, *ab initio*, from some disinterested fount of innovation. Rather it is born of the social, the economic and the technical relations that are already in place."

Wiebe E. Bijker & Jhon Law

All sorts of social relations and interactions shape technology, an argument also affirmed by Volti (2008). For him, we must always consider the entire set of social relations and structures require to design, develop, produce, distribute and even use technology. For Volti that means that social organization is an important dimension of technology. (p. 5). Schematically, he then defines technology as a **system produced by humans that employs knowledge and organization to make objects and developed techniques for the achievement of specific goals** (Volti 2008). Technology is then a combination of devices, skills and organizational structures. A good example is production technology. When social scientists speak of production technologies, they speak not only of tools and equipment, but also of the physical design of production processes, the technical division of labor, the actual deployment of labor powers, the levels of social cooperation and conflict, the chains of command and hierarchies of authority and the particular methods of coordination and control used (Harvey 1999). Hence, production technology is not limited to tools and instruments of manual operation in the labor process but also to the total set of social relations and structures necessary to design, develop, manufacture, distribute and even use devices and the production technology itself.



Some exercises

Exercise 1: Think Critically

Ponder the following question: Is the I-phone a technology? Why?

Your answer:

Exercise 2: Think Critically

Ponder the following questions posed by Rudi Volti (2008) in his book *Society and Technological Change*:

1. Do all technologies require material artifacts of some sort? Why?

Your answer:

2. Does it make any sense to speak of bureaucracy as a kind of technology? Why?

Your answer:

Exercise 3: What do you think?

Taylorism is a factory management system developed in the 19th century to increase efficiency by evaluating every step in the manufacturing process and breaking down production into specialized repetitive tasks. (http://www.merriam-webster.com/dictionary/taylorism). It was developed by Frederick W. Taylor. His "scientific management" of labor and manufacturing processes consisted of four principles:

1. Replace rule-of-thumb work methods with methods based on a scientific study of the tasks.
2. Scientifically select, train, and develop each employee rather than passively leaving them to train themselves.
3. Provide "Detailed instruction and supervision of each worker in the

performance of that worker's discrete task".

4. Divide work nearly equally between managers and workers, so that the managers apply scientific management principles to planning the work and the workers actually perform the tasks.

Recall Volti's (2008) definition of technology. Does it make any sense to speak of taylorism as a kind of technology? Why?

Your answer:

Let's try it again. How much do you know?

Answer the following:

When social scientists talk about any system that uses knowledge and organization to produce objects for the attainment of specific goals they are referring to:

a. Science
b. Culture
c. Technology
d. Society

Assessment

Please, complete the following statements:

1. Something new I learned from this learning module was . . .

_____

_____

_____

_____

_____

_____

_____

_____

_____

2. Which was the most important concept that you learned from this learning module on technology?

_____

_____

_____

_____

_____

_____

_____

_____

3. Which was the muddiest point you confronted while completing this learning module on technology?

_____

_____

_____

_____

_____

_____

_____

_____

Bibliography

Bijker, W. E. (1992). The Social Construction of Fluorescent Lighting, or How an Artifact was Invented in its Diffusion Stage. In W. E. Bijker, & J. Law (Eds.), *Shaping Technology/ Building Society* (pp. 75-102). Cambridge: MIT Press.

Bijker, W. E., & Law, J. (Eds.). (1992). *Shaping technology/Building society.* Cambridge: The MIT Press.

Feenberg, A. (1995). Subversive Rationalization. In A. Feenberg, & A. Hannay (Eds.), *Technology and the Politics of Knowledge* (pp. 3-22). Bllomington: Indiana University Press.

Harvey, D. (1999). *The Limits to Capital.* New York: Verso.

Scott, J., & Marsahll, G. (2005). *Oxford dictionary of Sociology.* Oxford: Oxford University Press.

Volti, R. (2008). *Society and Technological Change.* New York: Worth Publishers.

Further Reading

Feenberg, A., & Hannay, A. (Eds.). (1995). *The Politics of Knowledge.* Indiana: Indiana University Press.

MacKenzie, D., & Wajman, J. (Eds.). (1999). *The Social Shaping of Technology.* Buckingham: Open University Press.

Marcuse, H. (1991[1964]). *One-Dimensional Man.* Boston: Beacon Press.

Thomas, R. J. (1994). *What Machines Can't do.* Berkeley: University of California Press.

Volti, R. (2008). *Society and Technological Change.* New York: Worth Publishers.

This learning module was prepared by José Anazagasty. He teaches sociology for the Department of Social Sciences at the University of Puerto Rico at Mayagüez.

Tel. 787-832-4040 exts. 3839, 3407, 3303
Fax. 787-265-5440

Address:

University of Puerto Rico
Mayagüez Campus
Faculty of Arts and Sciences
Department of Social Sciences
PO Box 9266
Mayagüez, PR 00681-9266