# Chapter 25
# HCI and E-Learning:
## Developing a Framework for Evaluating E-Learning

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## ABSTRACT

*This chapter developed a framework for evaluating e-learning for use in Human Computer Interaction (HCI). A systems approach was used in the study; input, processes and output. It discussed the different assumptions about how people learn; behaviorism, cognitivism and constructivism. Further, it examined the common threads in the definitions of e-learning and the literature on evaluation of e-learning models. Nine categories of evaluation of e-learning were identified but five were reviewed because the remaining four overlapped. Two separate evaluations were reviewed under each category, making a total of ten reviews. The reviews showed that the evaluations were not conducted in the same way even within the same category making comparisons difficult. The framework was developed from the highlights in the review. The developed framework can be used to evaluate different e-learning modules along common lines making it easy to compare evaluations. It is hoped that over the next few years, a consistency in evaluations of e-learning would be achieved for use in HCI.*

## INTRODUCTION

This chapter would develop a framework for evaluating e-learning for use in Human Computer Interaction (HCI). Before an evaluation can be done, there must be an input, some processes and an output. How do we know that the output is actually the desired outcome? How do we know if the process we are using is actually the correct process? If the process is correct, can the input be wrong?

This chapter will attempt to answer some of these questions by developing a framework for evaluating e-learning. However, before examining different models of e-learning, the inputs, processes and the outputs in Human Computer Interaction will be examined (see Figure 1). The HCI process takes place in a system.

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*A system is a set of objects together with relationships between the objects and between their attributes. (Hall and Fagan, 1956)*

*---we propose that a system be taken as a nested network, with the underlying structure of a nested graph. (Harary and Batell, 1981)*

Miller (1956) described a system as an entity that has common properties, constraints and the parts within the system are dependent on parts within and outside the system. The common thread in the three definitions is the inter and intra connections of all the parts.

In systems theory, the system consists of the inputs, the processes, the outputs and the feedback (Richey, 1986). The interactions in the system could be the processes, the constraints, the instructions and the feedback (Miller, 1965; Richey; 1986). The feedback can be negative or positive. The negative feedback does not connote a bad process. The negative feedback is what keeps the system the same. As illustrated in Figure 2, the information from A goes back into A through channel B so that the system remains the same. This is a negative feedback. When the inputs from A keep increasing in steady amounts, this is a positive feedback. "Positive feedback alters variables and destroys their steady state" (Miller, 1965 p. 35).

A system can also be affected by the supra system. The supra system has control over the system. The environment can be the immediate environment or the total environment (Miller, 1965). The immediate environment includes the system without the supra system. The total environment includes the immediate environment and the supra system. An example of a system is a university. The university makes use of an e-learning platform. Inside the system, there are subsystems. Each subsystem carries out similar functions. In each system, there is an echelon of processes that are arranged in hierarchy. Systems contain levels of different functions. The e-learning model/module is affected by learners' and

*Figure 1. Input, process and output in a system*

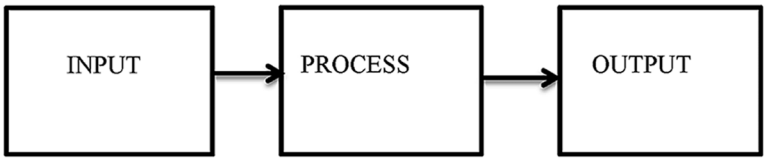


*Figure 2. Illustration of a feedback system*