Abstract

This search is concerned with error detection and correction in digital communication to insure the transmitted digital information from the transmitter to the receiver is in height reliability. Since most errors occur during information transmitting across the communication channel, because of the noise and interfacing operation.

Since laboratory work plays an important role in instructional engineering specially in communication field (the operation of error detection and correction in digital communication) from this shows the importance of this research that aims to design and implement instructional system of error detection and correction in digital communication that consists of two main parts:

1- Hardware consists of apparatus (machine) and printed material related to it. The apparatus is designed in the form of modules and it consists of all the constituent parts of the error detection and correction circuits such as (shift register. X-OR gate, AND gate) etc, as well as all the necessary required modules for implementation of the engineering application such as (ICs, clocks, logic indicator (LED)),etc. The printed material related to the apparatus is designed in the form of modules by the individual instruction style, it consists of six parts that represent all the experiments that can be done on the apparatus.

2- Software consists of instructional programming that includes six experiments, three of which deal with linear block codes, and the others with cyclic block codes.

The instructional system is designed with the help of fundaments and principles of technology of instruction and instructional system designed to meet the needs and objectives systematically.

Questionnaire to member of staff and students was used in order to evaluate the system performance.

The result show that the effort is successful as the apparatus has enhanced the capabilities of students who use it understand the taught material.

The present research has reached many conclusions, the most important are:

1- There are different ratios to detect the error in systematic linear and cyclic block codes (7,4), as follows:

- The ratio of detecting single error 100%.
- The ratio of detecting double error 100%.
- The ratios of detecting triad error 80% are 35 probabilities, seven of them can not be detected because of their similarity to the coding words in the same code .
- The ratios of detecting quadric error 80% are 35 probabilities, seven of them can not be detected because of their similarity to the coding words in the same code.

2- The design and implementation of the instructional system as modules help to form error detection and correction circuits and to facilitate the apparatus modules maintenance.

3- The instructional program (software in the instructional system) helps to increase the reaction between the students and the task with the aim to acquire skill, that helps to achieve the goals of our research.