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This study aimed at the development and validation of computer-aided instructional (CAI) materials based on the needs and problems of teachers in teaching Mathematics IV.

In the development of the programmed texts, the researcher used the research based development methodology (R & D) which is meant to produce, validate and test the effectiveness of the CAI materials as an instructional delivery mode. The major steps in the R & D cycle followed by the researcher in developing the computer-aided instructional materials are the following: (1) preliminary preparation, (2) designing the CAI program, (3) development of the computer-aided instructional programs, (4) internal validation of the CAI materials, (6) tryout of the CAI materials, (7) evaluation of the tryout results and (8) modification and the final production of computer-aided instructional materials. This study also made use of multimedia presentation with support on Microsoft PowerPoint.

The computer-assisted instructional materials were evaluated in terms of objectives, content, activities, design characteristics, and evaluation items by 25 mathematics professors with knowledge of computer-aided instruction and computer trainers using a five-point evaluation checklist patterned after a model for evaluating modular texts. These materials were revised based on the results obtained and suggestions given by the panel of experts. After the revision of the CAI materials, they were tried out to a group of randomly selected students from Ilocos Norte National High School determine their effectiveness in developing concepts and skills in mathematics by employing the one group pretest-posttest design. The data obtained in the validation and tryouts were analyzed with the used weighted mean, rank on means and t-test of difference between means of correlated samples.
Results of the analysis of the data gathered to determine the validity of the CAI materials as evaluated by experts and teachers revealed the following:

1. The computed over-all mean ratings of 4.80, 4.81 for CAI materials I, II, and III, respectively given by the panel of experts with descriptive ratings of excellent show the evaluators’ favorable response to the self-instructional materials.
2. Results obtained also indicate a highly significant difference between the pretest and posttest mean scores in the three computer-aided instructional materials.

Consequent to the foregoing findings, the following conclusions are drawn:

The three CAI materials were found excellent in terms of objectives, content, activities, design characteristics and evaluation measures. Hence, they are valid and can be effective as a delivery system for improving the students’ skills in computation, reasoning and problem solving necessary to help them understand and interpret many aspects of modern society and the rapidly changing world.

Based on the comparison of the mean gain differences of the pretest and posttest of the students, it is concluded that the programmed materials are effective in developing concepts related to circles, plane coordinate geometry and exponential functions. The significant gain in the performance of the students is attributed to the following characteristics of the programmed materials: active participation or responding, mastery of the objectives at a pre-specified criterion, clear statement of objectives and utilization of visuals in the form of diagrams, charts and other illustrations, presentation of subject matter in learning chunks, interacting with real objects and reinforcement of correct responses to shape behavior.