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The Effectiveness of the Use of Software on Math and English Learning at Junior Primary Level

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Abstract

The study reported on in this paper examined the effectiveness of the use of software on Mathematics and English learning at junior primary level.

Traditional teaching methods were continued throughout the period of the study for all pupils involved. Computer use did not replace, rather it enhanced, these traditional methods. One group of pupils used a software package linked to the content of the English curriculum while the second group used software supporting the mathematics curriculum.

Both groups undertook the same teacher designed tests before and after the period of the study. Pre and post test scores were compared for both groups. Other learning, incidental to the use of technology was observed and reported on.

Introduction

The use of technology in primary education must be driven by pedagogy. Software which is not teacher designed nor purpose built cannot match precisely the objectives of the primary school curriculum. The two packages used in this study, Bailey's Book House and Millie's Maths House supported many of these learning objectives. The current Irish primary school curriculum, last revised in 1971, is largely influenced by the learning theories of Jean Piaget. These theories have led to the child centred, activity based classrooms of Irish primary schools. The computer was only one of many learning activities available to the children in this study.

The study examined:

- the integration of the multimedia PC as a learning activity
- the effect of software on children's learning
- the stimulation and motivation provided by the computer
- the skills developed by the pupils during the study

The Infant Classroom

The role of the successful infant teacher is to facilitate appropriate learning situations and activities in the classroom which lead the pupils to self initiated exploration of their environment and thence on to generalised learning. Teacher guided discovery learning based on the child's innate desire to play, talk, imitate and manipulate materials is the hallmark of good infant educators.

Pupils at junior primary level need short term goals together with much praise and encouragement in their attempts at achieving those goals. High pupil teacher ratios make it difficult for the teacher to provide such praise when and where it is

immediately required. During the period of the study the computer provided immediate, non threatening feedback to all pupils while they were engaged in an enjoyable activity. Pupils of this age need new experiences and activities and must be given the opportunity to return repeatedly to an activity which they find enjoyable. This was possible with scheduled use of the computer as a learning activity in the infant classroom. Much learning at this level is the result of well planned pleasurable play. The computer was seen as an instrument of play - a toy - by the children participating in this study.

English Language Activities

A wide range of pre-reading activities are necessary for the development of reading skills. Auditory skills are essential for successful reading. An awareness of different sounds, auditory perception of initial and final consonants and rhyming sounds are pre-reading activities provided by the software used in this study. These skills are basic to the independent self reliant reader. The computer provided a novel approach to practice in these often repetitive and sometimes tedious activities.

Mathematics Activities

The computer provided repeated opportunities for practice in counting, number and shape recognition and pattern making. The teacher was equipped with an additional resource to stimulate the pupil in these activities, one which gave immediate and appropriate feed back to the pupils.

Methodology

Two classes of 23 pupils, aged 5 years 10 months to 7 years 5 months, were involved in the study. These were mixed ability classes to which pupils had been randomly assigned on admission to school the previous year. Both groups were taught using the traditional methods of audio tapes, video tapes, concrete materials, games, work-cards, work- sheets, work- books and blackboard work.

A multimedia PC was provided on loan and one week was spent instructing the pupils in both groups in how to use the computer and explaining to them the tasks involved. A second PC was leased and, for the four week duration of the study, one computer was located in each classroom. The pupils in one classroom used Bailey's Book House while those in the second classroom used Millie's Maths House. The unfavourable ratio of pupils per computer meant that access was strictly regulated and controlled. Each child averaged three ten minute sessions per week. Each pupil worked through all activities on the CD ROM in whatever order she decided and could then return to favourite activities.

Both groups of pupils were pre- tested using teacher designed tests. In all there were 20 sub-tests. Reading sub-skills tested included letter recognition, identification of word families, provision of initial consonants, matching words to pictures. Tests in Mathematics included recognition of numerals and shapes, number of objects in a set, addition and subtraction of single digit numbers. At the

end of four weeks of computer use the pupils were tested again using similar tests and the results were compared.

Results

Both groups showed some improvement in post-test scores. To compare scores within each group t-tests for paired samples were used while t-tests for independent samples were used to compare scores of intervention and control groups. A vast amount of data was collected and analysed but statistical test results could not attribute any gains made to use of software alone.

Summary and Conclusions

The computer was successfully integrated as a learning activity in the two classrooms involved in the study. There were gains in raw test scores which could be attributed either to traditional teaching methods or to software use or to a combination of both. Pupils were stimulated and motivated by the arrival of the computer in the classroom. Working at repetitive and tedious but necessary tasks became a fun activity. Basic computer skills were learnt by the pupils. By working independently through the software packages the pupils developed decision making, time management and record keeping skills. The computer provided the supportive learning environment required by all pupils of this age, in particular for those less able pupils needing additional practice before achieving class learning objectives.

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