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RETENTION AMONG COLLEGE STUDENTS: A COMPARISON OF TRADITIONAL VERSUS PRECISION TEACHING

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The speed and accuracy of decision-making in a clinical situation is vital for the professional nurse. Except for the pioneering work of Dean (1973), nursing education has not emphasized fluency of correct responses. At the Lurleen B. Wallace School of Nursing of Jacksonville State University, retention of precision Pathophysiology was evaluated.

Retention of material is of concern to practically everyone in higher education. Methods of improving retention should be especially welcome by educators who are concerned when their students do not possess the knowledge and skills they were thought to have mastered. Retention of learned material is affected by the kind of feedback from evaluation (Sassenrath & Garverick, 1965), the type and frequency of evaluation (Spangler & Hankins, 1975), and the timing of feedback from evaluation (Olander, McDade, Grimsley, Yaracs, & Merbitz, 1981a). Spangler and Hawkins (1975) demonstrated that immediate retention (i.e., a week interval) of psychology students was significantly enhanced by precision teaching. The present study was designed to compare the long-term (eight months) retention of nursing students following a course in Pathophysiology taught using precision teaching and traditional methods.

Method

This study was conducted with a total of eighteen students in Biology 360: Pathophysiology. Nine students were taught using precision teaching and nine using traditional methods. The latter group attended two one and one-half hour lectures per week. Student performance was measured with an essay exam after every two chapters and a comprehensive final exam.

Students taught using precision teaching proceeded at their own pace without lectures (Olander, McDade, Ulrich, & Merbitz, 1981b). Testing consisted of students responding verbally to ten randomly selected questions on flash cards. Prior to the actual evaluation, students were allowed to examine the questions and assemble the cards in any order with unlimited time to contemplate their answers. Students were required to answer eight correct responses per minute at 80 percent mastery in order to proceed to new material. Students charted their daily progress on Standard Celeration Charts, plotting frequency correct, frequency incorrect, and record floor (Pennypacker, Koenig, & Lindsley, 1972). Comprehensive verbal review tests of ten questions from each chapter were given after every two chapters.

Both groups were taught by the same instructor using the textbook, **Basic Pathophysiology** (Groer & Shelkton, 1979). Both groups received three semester-hour credits for the course and covered the same number of chapters. Students taught using precision teaching earned an average course grade of 3.00/3.00, while the students taught using traditional methods earned a mean course grade of 1.78/3.00.

The dependent variable, eight month retention, was measured by an evaluation tool prepared for this study. Part I of the evaluation measured retention for definition and explanation of the physiologic significance of thirty-six terms. Part II measured retention of six physiologic concepts in essay form, one from each chapter.

Each group was tested by an unannounced retention exam. The instructions on the evaluation were read aloud, and participants were informed that they had been selected for research in nursing education, with names remaining anonymous. After both groups were tested, the anonymous evaluations were double-blind graded by two instructors.

Results

The evaluations for both groups were compared by the Mann-Whitney U Test. The results were statistically significant with the calculated probability of wrongfully rejecting the null hypothesis $<.05$. As shown in Chart 1 the students taught using precision teaching were 1.8x more accurate and 1.8x more fluent than their traditionally taught counterparts eight months after their pathophysiology course. Surprisingly, these students, who never had

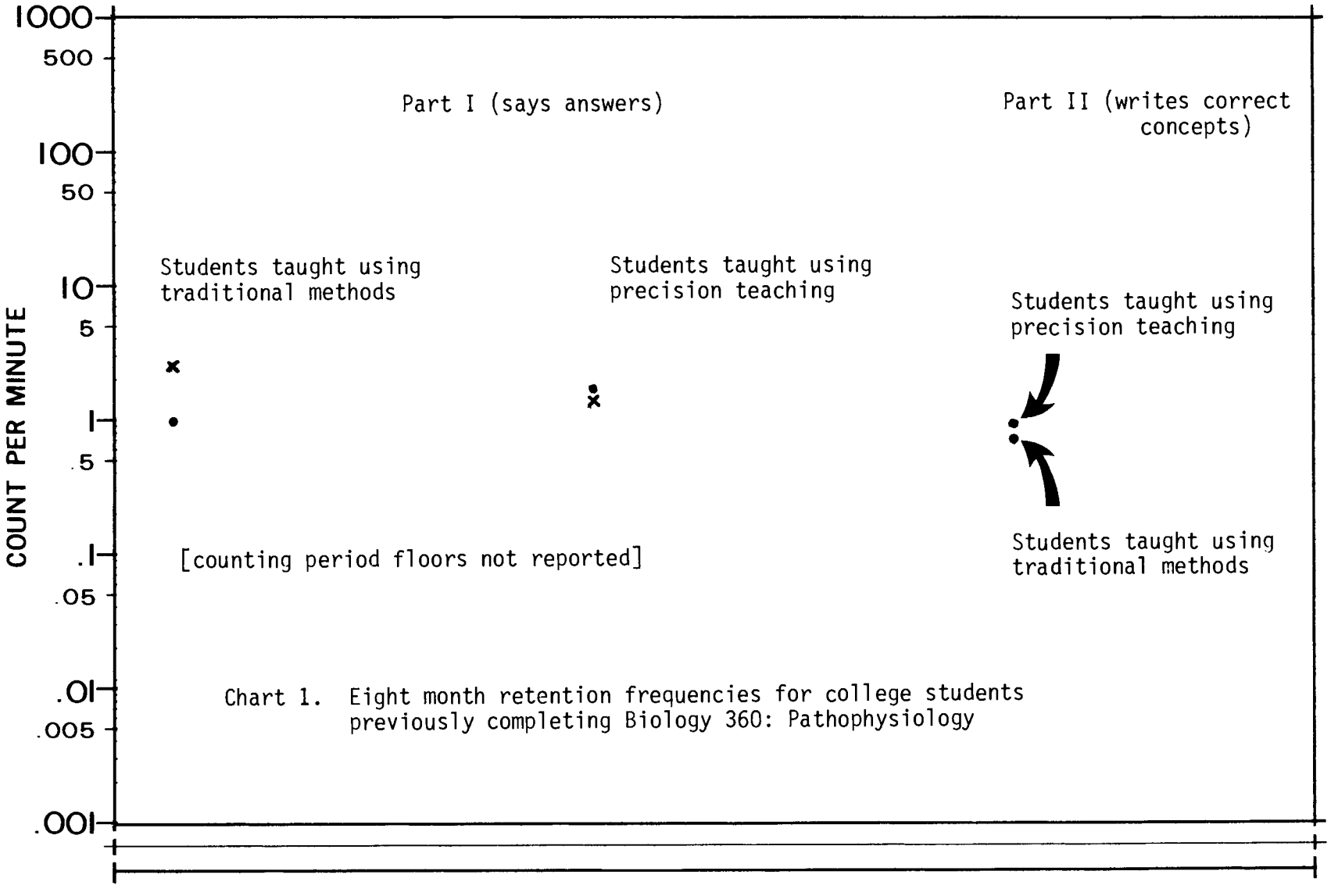

Chart 1. Eight month retention frequencies for college students previously completing Biology 360: Pathophysiology

two groups of nine students

says answers or writes correct concepts

(mean frequencies)

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DAILY CHART TRACER (CT-8)

written an essay exam in pathophysiology performed 1.4x better than the traditionally taught students whose performance was always measured in this manner.

Discussion

Precision teaching has been shown to enhance the short term retention of college students (Spangler & Hawkins, 1975). Also, frequency testing of key concepts in a discipline until proficiency is reached has been found to generalize to applications of these concepts in the less structured situation of essay exams (McDade, Rubenstein, & Olander, 1982; Olander, et al., 1981b). The data generated in the present study support the conclusion that precision teaching enhanced generalization of this type as well as long term (eight month) retention.

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Abstracts

The following are abstracts of recently published articles or completed research. Figure 2 from the first article is included to demonstrate how the data was displayed in standard format for a traditional journal.

Merbitz, C. T., King, R. B., Bleiberg, J., & Grip, J. C. (1985). Wheelchair push-ups: Measuring pressure relief frequency. **Archives of Physical Medicine and Rehabilitation, 66,** 433-439.

Abstract: Ischial pressure sores (PS) are a long-recognized complication of wheelchair confinement, yet teaching spinal-cord patients to establish lift-off behavior habitually and permanently remains a challenge. A new device was developed to record automatically and continuously the wheelchair lift-off behavior of spinal-cord injured patients. Data from seven patients who used the device for between 768 and 1800 hours each are reported. The device was used to monitor longitudinally the behavioral compliance of each individual with prescribed lift-off intervals using standard teaching procedures. Wide variability between patients and within patients over time was found. Experimental interventions including the use of an electronic timer and written and oral feedback of the previous day's data also varied in their effectiveness. Data from one patient who developed a pressure sore while being monitored suggest that there is no simple relationship between lift-off intervals and PS formation.