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THESIS ABSTRACT

Title : Analysis of Problem - Solving Strategies in Chemistry

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Subject Area : Chemistry

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Statement of the Problem

The study identified common problem solving strategies used by chemistry students and analyzed the difficulties they encountered in solving quantitative chemistry problems.

Attempts were made to answer the specific questions regarding the major problem :

1. What are the common problem solving strategies used by the different problem solvers (VGPS, GPS, PPS, VPPS) for each problem?
2. How do the strategies employed by the different problem solvers (VGPS, GPS, PPS, VPPS) differ for each problem?
3. In what phase/s of problem solving do they need remediation?
4. How do the difficulties encountered by the different problem solvers (VGPS, GPS, PPS, VPPS) differ for each problem?



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5. How would the problem solving strategies of each type of problem solver (VGPS, GPS, PPS, VPPS) be correlated with the efficiency index?

The study was limited to an intact section of 27 junior students of the Catanduanes State Colleges Laboratory High School during the Fourth Grading Period of school year 1990-1991.

Procedure

The investigator conducted individual audiotaped interview-problem solving sessions with each student. The problems given included lessons on molarity, chemical reactions and percent composition. Each tape was transcribed into a script, and the script was analyzed according to the phases and behaviors defined on the Problem Solving Behavior Tally Sheet (PSBTS). The scripts were further analyzed for difficulties the subjects encountered in solving the problems.

Treatment of Data

The Problem Solving Behavior Tally Sheet was used to analyze and categorized the statements made by the subjects as they solved each problem. For each student, per problem, the percentage distribution of categorized statements according to phase and type of behavior within the phase was determined. The Efficiency Index, EI, was computed per sub-phase for each subject per

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problem. A Spearman Correlation Coefficient was then computed for the different types of problem solvers (VGPS, GPS, FPS, VPPS) per problem. The EI rank of each subject was correlated with the percentage rankings of his employment of each of the 11 possible problem solving behaviors. High positive coefficient implied that the students who were more efficient problem solvers employed a given problem solving behavior to a greater degree. Negative coefficient implied that the application of that particular problem solving behavior was counterproductive in terms of efficiency in solving that particular problem. From these data it was possible to identify which of the problem solving behaviors were most efficient in solving each type of problem.

Findings and Conclusion

1. Out of the 27 samples, 8 or 30% of the sample successfully solved all 3 problems and were classified as VGPS, 10 or 37% successfully solved 2 problems (GPS), 6 or 22% successfully solved 1 problem (FPS), and 3 or 11% were not able to solve any problem (VPPS).

2. The four most common problem solving strategies used by the different types of problem solvers were :

Tentative Manipulations (C-3), Relational Statements (A-1), Random Trial and Error (B-1) and Systemat-

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lyze verbally the problem on hand right during the class so as to detect difficulties immediately and give the necessary remedy to ensure better understanding of the chemistry concept/s involved.

