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# EXPERIENTIAL SYSTEMS ANALYSIS

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## ABSTRACT

There is a growing interest in experiential teaching approaches without the empirical evidence that it is a more viable approach than the traditional instructional methodology for systems analysis. The objectives of this research are to develop a model for comparing methodologies for the teaching of systems analysis, to utilize the model to test performance of the subjects and to identify and apply appropriate measures for assessing performance. This paper intends to utilize a research framework to compare experiential and traditional approaches to teaching Systems Analysis using a process oriented methodology for analysis.

## Research Methodology

For students concentrating in Management Information Systems at the undergraduate level, a course in Systems Analysis is usually required as a foundation course to meet the Information Systems curriculum requirements. The purpose of this research is to compare user performance between the experiential and traditional approaches to the functional decomposition of existing systems in the Systems Development Life Cycle It is hypothesized that the experimental teaching approach, as compared to the traditional method, will lead to significantly better user performance in the analysis of existing systems. The independent, dependent and control variables are explained in the following paragraphs.

The independent variable is the presentation methodology (Traditional or Experiential) utilized by the course instructor to provide the research subjects a basis for developing system requirements. Both methods utilize DeMarco's (1 979) methodology for systems analysis. The traditional approach follows a highly structured syllabus with formal lectures by the instructor, scheduled presentations of an assigned systems project and scheduled examinations. The experientially oriented class has a very similar syllabus. However, there are no examinations or lectures. Grading will be based upon each student's and team's analysis, each individual's contribution to the team and each individual's participation in classroom discussion. The client is the same in both classes. The client's system's requests are similar in scope and content and are in the same industry. The class project dominates the semester.

Task and human are the control variables in the experiment. Since the purpose of the research is to compare user performance between the traditional and experiential methods for teaching systems analysis, a scenario or case that requires the participants to understand user requests and to represent their analyses have been selected. The main performance variable, modeling correctness, is the degree to which a particular teaching approach provides the correct solution not only in terms of semantic richness, but also in terms of solution representation.

## Research Strategy

The laboratory study requires each group of students to develop user specifications for similar cases using a process methodology similar to that formalized by DeMarco (1979). The process approach utilizes data flow diagrams as the primary vehicle to document the system under investigation. Both test groups utilize a CASE tool (Briefcase. EasyFlow or Visible Analyst Workbench) for data flow diagrams. The case problem is presented in oral form to the students. It is not biased in favor of either pedagogical approach. The problem is non-trivial and robust but simple.

Undergraduate students in an elective Systems Analysis class are the test subjects. They have been asked to complete a questionnaire related to computer and modeling experience and to personal demographics. Each group has been trained in using the same methodology (process) for systems analysis. However, one group experiences the 'normal" instructional method of lectures, examinations and project exposure. The other group is presented with a similar project to address but with no formal lectures or examinations. The syllabi in both groups is the same as they relate to assigned readings.

The principle measure of the subjects' analytical efforts focuses on intergroup comparison. Each subject's outcome is measured against a "correct solution" for the system under investigation. Identification of the system to be investigated, the external entities, the major processes, the significant data stores and the appropriate data flows are the primary foci.

## Initial Findings

The traditional instructional portion of this research was completed in December 1 991. The experiential component was completed in December 1 992, utilizing data from the FaIl 1 992 Systems Analysis class. Preliminary results indicate a higher level of student satisfaction with experiential learning. The initial resistance to a non-traditional pedagogical approach appears to have waned and a commitment to solving a "real" problem appears to have heightened. Final data will not be available until January 1 993 in order to complete the analysis.

## Contributions, Limitations & Future Directions

The primary contribution of this research effort is to empirically assess whether or not an experiential approach is better than a traditional approach for teaching individuals how to analyze a system. However, since a convenience sample was utilized to compare and test the methodologies, generalizability across situations and subjects may not be appropriate. Consequently, the results of this proposed research will be constrained in applicability to design and sample issues utilized in the research project.

A major concern of this research effort will be its link to the complete Systems Development Life Cycle (SDLC). Since the focus of the research is on only the Systems Analysis portion of the SDLC. linkage to the subsequent stages of design, implementation and installation may be an appropriate future research effort.

## REFERENCES

DeMarco, T. (1979). Structured analysis and system specification. Englewood Cliffs, NJ: Prentice Hall.

Rogers, E. (1962) Diffusion of Innovation New York: The Free Press.