

# USING PERT ANALYSIS FOR STUDENT LEARNING CONTRACTS

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## ABSTRACT

Three technology disciplines used a Program Evaluation and Review Technique (PERT) modified network for student teams to develop learning contracts. The adult learning andragogy approach<sup>1</sup> was followed emphasizing student self-direction in their own learning, shared experiences, near-term application and performance feedback.

The PERT methodology was used in Computer Technology, Electrical Engineering Technology and Organizational Leadership courses in which student teams determined their final learning objectives, interim benchmark targets, and individual responsibilities in fulfilling these contracts. At each benchmark 360<sup>o</sup> evaluations were performed including team peers, instructor and lab assistants to provide timely feedback allowing for student and team improvement. Preliminary results indicate (1) improved learning, (2) increased acceptance of responsibility, and (3) a significant understanding of how team members must function to attain the desired results.

## INTRODUCTION

The andragogical methodology for college engineering students has been found to be superior to other teaching methods.<sup>2</sup> Once a foundation has been established, students develop self-directed, team oriented projects, plus final and interim learning objectives. This method typically leads to improved learning, communications and problem resolution. This was the basis of three Purdue University instructors' experimentation in classes with quite different content.

The computer technology course "Computer Programming Database Concepts" required the students to learn and use a modified PERT analysis using network paths, time requirements and student responsibility designations, to plan the complete development of a database. The team reported on-going results and completed 360<sup>o</sup> evaluations at each benchmark.

The EET "Electronic System Fabrication" course first introduced project management processes, requirements and normal 'problems.' A five member team used the PERT analysis technique to layout the semester plan of action(s), accomplishments and learnings. They identified and developed a network showing the key tasks, responsibilities and deadlines. The instructor primarily acted as a facilitator and let the students struggle, as appropriate, so the normal team and project difficulties would be experienced. This, too, increased both their content and team-process learning.

The "Leadership Philosophy" senior level course also followed the learning contract PERT technique. Student teams determined the end and interim objectives and responsibilities. The instructor demonstrated several models the teams could follow but PERT plan coordination among the five teams was mandatory to complete their learning objectives.

## EET ANDRAGOGY APPLICATION

Team participation was not a new concept to the EET student, but being fully responsible for planning and accomplishing a major semester project as a team was a new experience. The team had a single well-defined project: to conceive, design, prototype, fabricate, test and validate a unique operational function generator. Their planning required a “PERT” chart identifying all tasks, activities, responsibilities, benchmark deadlines and ultimate completion. The plan status was reported on a weekly basis throughout the semester. This learning process did cause “some” concern among the students.

A portion of the “PERT” Timing Chart developed by the student team is presented below as Figure 1.

### LEARNING TO DATE

Team meetings conducted by the students caused concern to most students. Meeting agendas, meeting notes, logbooks, and project binders were found helpful and have become a norm. These four concepts and the “PERT” chart made the day-to-day discussions between students easy, since “all” pertinent information was readily available.

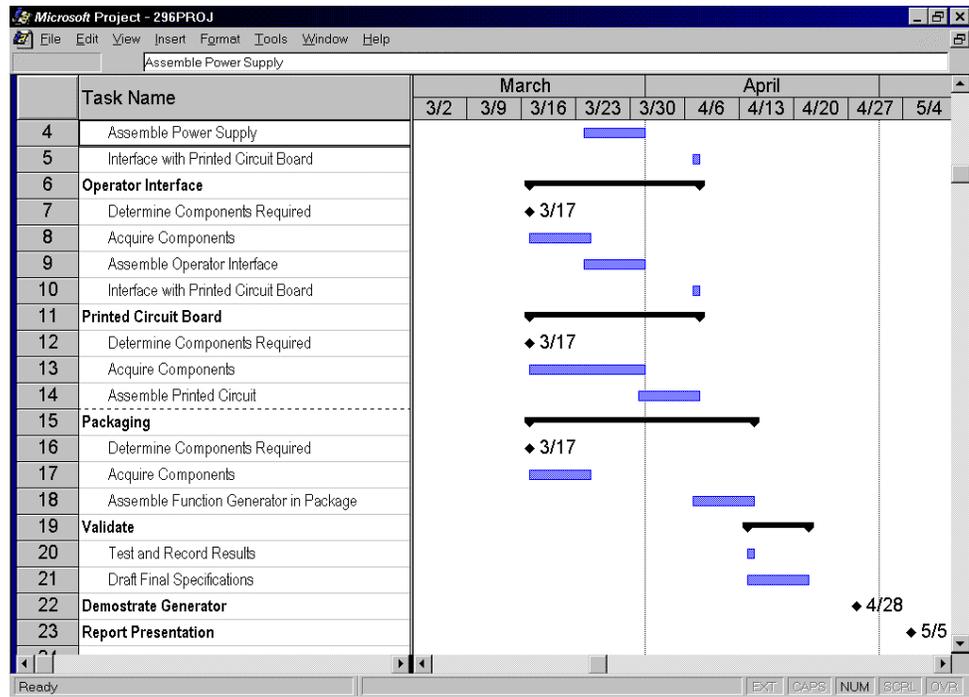


Figure 1 Project Timing Chart

The instructor’s change to a facilitator’s role was difficult for both the instructor and the students. The instructor spent considerable class time and outside class time helping the students improve their conflict resolution and interpersonal skills.

The remaining hurdles are 360-degree evaluations and the completion of the project task.

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