Chapter 10
Effectiveness of the TAPS Packages

INTRODUCTION

This Chapter discusses the effectiveness of TAPS packages and provides a brief account of the differences between the approach of the TAPS packages used in this study with that of commercial simulation packages accompanying the Engineering Mechanics Dynamics textbook.

EFFECTIVENESS OF THE TAPS PACKAGES

In general, there exist various ways to measure the effectiveness of learning packages. Tessmer (1995) provided a number of variables that could be used to evaluate the effectiveness of multimedia contents such as aesthetics, transparency, forgiveness, matching between the metaphors and the learning experiences, informativeness, seamlessness of contents and media as well as the achievement of the desired learning experiences and learning outcomes. While much work has been devoted to research on the impact of technology in education, there is little known about its effectiveness. Furthermore, there are certain gaps in these research efforts that need to be addressed and require further investigation, specifically the

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lack of theoretical framework (Institute of Higher Learning Policy, 1999). In most evaluation studies, the important questions concern the comparative effectiveness of various types of learning packages when measured against traditional ones rather than the innovation of the delivery model itself and the factor that contributes to its effectiveness (Institute of Higher Learning Policy, 2000).

According to Psaromilingkos (2003) the effectiveness of a learning courseware is influenced by a number of variables such as: (a) quality of the learning resources (instructional material, exercises); (b) changes of the preferred mode of study (with or without the use of computer technology); (c) computer mediated instructions with peers and instructors and means of communication (e.g. email); (d) the quality of services that the software and hardware infrastructure provide (course management tools, multimedia conferencing systems); (e) time spent on the task using the system and (f) the learner's profile (learning style, previous experience, etc).

However, the overall effectiveness of the TAPS packages in this study was examined to confirm its design and measured using quantitative techniques such as open-ended questionnaires feedback, as stated in Section 9.5, a selection of questionnaires from the close-ended questionnaires (Table 10.1), and observational results mentioned in Section 10.3. The questions from the close-ended questionnaires were selected on the basis of the majority of respondents who selected "*strongly agree*" and "*agree*". The list of these questionnaires and results (in bold text based on number of students - responses) are shown in Table 1.

The results (in bold text) shown in Table 1 complemented the conclusion that the problem solving techniques and the preferred mode of study were the most significant predicting variables for effectiveness of the TAPS packages. Moreover a number of suggestions were made for the enhancements of the TAPS packages as stated in Section 9.

The use of multimedia coupled with desktop virtual reality was found to be an added advantage for students using the TAPS packages. On the whole, the self pace independent problem solving style of learning was much appreciated by slow learners.

EFFECTIVENESS OF THE TAPS PACKAGES BASED ON THE OBSERVATIONAL RESULTS

The following are the observations made during the trial of the study by the author and the instructor:

- Students rarely called the instructor for an explanation / query related to the TAPS packages.
- The user-friendly nature of the TAPS packages seemed to keep the student engrossed in problem solving.
- Most of the students were able to finish the task allocated to them.
- Most of the students left the lab with a positive remark about the TAPS packages and also felt enlightened about the subject matter.

These observations also help establish the effectiveness of TAPS packages to a certain extent.

The impact of learning by employing animation techniques, graphics, 2-D / 3-D and desktop virtual reality environments in this study promotes the usage of multimedia presentations (problem-solving), especially in technical discipline areas since these presentations will have a direct impact on the quality of the engineering materials at every level. Multimedia may become a standard level of instruction; its