

CHAPTER EIGHT ADAPTING AND IMPLEMENTING A CDIO APPROACH

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INTRODUCTION

Adapting and implementing a CDIO approach can potentially be of great value to educational programs and the students they serve. However, that means change—an inherently challenging endeavor, especially at a university. Program leaders are more likely to succeed in this change process if faculty are equipped with an understanding of how to bring about change, and provided relevant guidance and resources. This chapter discusses the implementation of a CDIO approach in terms of three change processes: cultural and organizational change, faculty development and support, and program change.

The transformation to a CDIO program will touch all faculty members in the program, and it will influence the context and the organization of the education program. To succeed, faculty need to view this as an instance of cultural and organizational change, and to make use of the lessons learned that facilitate such change processes. The first section of the chapter reviews these lessons and applies them to the university context.

Implementation places new demands on our faculty and teaching staff. We cannot expect them to acquire new skills without the resources to enhance their own competence. In the second section of the chapter, CDIO Standards 9 and 10 will be introduced. Standards 9 and 10 deal with the issue of faculty competence in professional skills and teaching. This section will also discuss approaches that enhance the competence of current faculty and build a stronger faculty in the future.

The CDIO Initiative supports the change process and the enhancement of faculty competence by developing resources and frameworks. The third chapter section presents a roadmap for program change that represents adaptation and implementation as an engineering design process. This third section outlines examples of supporting resources that are currently available.

CHAPTER OBJECTIVES

This chapter is designed so that you can

- recognize key success factors that influence change in an organization
- view the development of a CDIO program as an example of cultural change
- plan activities that enhance faculty competence in personal and interpersonal skills, and product, process, and system building skills
- plan activities that enhance faculty competence in teaching, learning, and assessment methods
- describe approaches and locate resources that facilitate the adoption and implementation of a CDIO approach in engineering programs

DEVELOPMENT OF A CDIO PROGRAM AS AN EXAMPLE OF CULTURAL AND ORGANIZATIONAL CHANGE

As described in Chapter Two, the dominant paradigm for engineering education today is one in which the *content* is disciplinary and based on engineering science. The unintended consequence of the transformation in the last century to this paradigm is that the *context* of the education also became based on engineering science and research. Some degree of cultural change is required to transform a program to the desired vision, one which better integrates the engineering science disciplines and sets them in the context of conceiving-designing-implementing-operating products, processes, and systems.

Fortunately, there is broad understanding of the factors that support successful cultural change in organizations. Adapting these change factors to the university environment facilitates the transition to a CDIO approach. We begin our discussion of change by re-examining the two central questions that were posed in Chapter Two:

- *What is the full set of knowledge, skills, and attitudes that graduating engineers should possess as they leave the university, and at what level of proficiency?*
- *How can we do better at ensuring that students learn these skills?*

The approach to answering the first question was largely answered in Chapter Three with the discussion of the CDIO Syllabus. Chapters Four to Seven presented approaches to answering the second question. But how can we convince our colleagues of the need to “do better at ensuring that students learn these skills?”

The second question is deliberately posed in the language of continuous process improvement. Of course we can do better! We can benchmark our peers and learn from best practice. We can better acquaint ourselves with