Educating Generalists versus Specialists - A Comparative Analysis on National Frameworks for Engineering Education in Norway before and after 2003

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Abstract — *Engineering education in Norway is in a rapidly changing process and paradigm shifting for the last decade. The Norwegian Ministry of Education and Research has initiated a number of reforms and restructures for higher education, including engineering education. The initiative was a national merging process to integrating over 130 local and district colleges into 26 regional university colleges. The merging process also intended to strengthen the potential future aspects, such as internationalization, research based teaching methods, quality assurance for teaching and learning activities, just to mention few.*

National Framework is a basic document to formulate criteria and guidelines for engineering education in Norway. For the last decade, this national framework has been changed twice, in 1996 and 2003 respectively. The current study focuses on the major changes in this national framework between 1996 version and 2003 version. The study compares the two versions and their similarities and differences. The comparison is undertaking in both versions' details, such as requirements, goals, expectations, technical specifications, structures, organizing, teaching methods and evaluations. The significant changes between these two versions are noticed almost for every detail. This raises a fundamental question for engineering education: Are going to educating generalists or specialists for our future engineers?

A parallel analysis for changes in quality international standards is introduced to compare with current study. It seems the quality concepts, the quality standards and their contents have been changed for two decades ago. The modern quality philosophy focuses on customers' satisfaction, need assessment, and documentation processing (dynamic aspects), while the traditional quality systems emphasized rather technical definition and specifications (static aspects). The similar trend and changes (dynamic vs. static aspects) are observed between these two versions of framework for engineering education. Perhaps, the modern quality philosophy has catalyzed the paradigm shifting for the modern engineering education and formulated a future profile for engineers?

Index Terms — *Comparative analysis, national framework, quality standards, an engineer's future profile.*