

27th IPMA World Congress

Reforming civil engineering studies in recession times

Sergios Lambropoulos^{a[1]}, John-Paris Pantouvakis^b, Marina Marinelli^c^{ab} Associate Professor, National Technical University of Athens, Iroon Polytechniou 9, Zografou Athens 15770, Greece^c Lecturer, Queen's University Belfast, University Road, Belfast BT7 1NN, Northern Ireland, UK

Abstract

The recent global economic and financial crisis has led the economies of many countries into recession, in particular at the periphery of the European Union. These countries currently face a significant contraction of both public investment in infrastructure and private investment in buildings and, as a result, the unemployment is particularly noticeable in the civil engineering and building sectors. Consequently, in all countries in recession the professional development of fresh civil engineering graduates is disproportionate to their high study effort and qualifications, since they rarely have the opportunity to gain experience in practice and their knowledge gradually becomes obsolete. Under these circumstances, it is imperative for the technical universities in countries in recession to plan and implement a substantial reform of the civil engineering studies syllabus. The objective should be to enable graduates to broaden the scope of their professional activity and increase their employability.

In this paper, the widening of civil engineering studies curricula is proposed, in particular in the light of the development of the graduates' potential on project, programme and portfolio management. In this direction, after a thorough literature review, including ASCE's Body of Knowledge for the 21st century and IPMA's Competence Baseline, it is recommended among others: to increase significantly the offered modules on project management and add new modules on strategy management, leadership behavior, delivery management, organization and environment etc; to provide adequate professional training during the university studies five year period; and to promote fresh graduates' certification by professional bodies. The proposals are exemplified by presenting a reformed syllabus for the civil engineering studies offered currently by the National Technical University of Athens.

© 2014 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](#).
Selection and peer-review under responsibility of the IPMA.

Keywords: Civil Engineering; University studies; Unemployment; Recession

1 Corresponding author. Tel.: +30-210-772-3720; fax: +30-210-772-3781.
E-mail address: laser@central.ntua.gr

1. Introduction

Civil Engineering Studies (CES) flourished after the Second World War. The societal quest for more and better civil engineers was initially driven by the immense need to rebuild what was destroyed. But very soon, this evolved to a long term tendency since the governments, in their effort to achieve economic development, had adopted worldwide the Keynesian theory, i.e. the use of public investments in infrastructure as the locomotive. The first positive results triggered the citizens' motivation for better living conditions (housing, tourism etc) and increased private investment in infrastructure. These phenomena were more evident in the countries under development. Though the sky was not always clear (e.g. the oil world crisis in the 70's) and neoliberal economic approaches were adopted by leading countries in the 80's (e.g. Reaganomics), it is the recent financial crisis and its repercussions (i.e. shrinkage of investments in infrastructure, high rate of unemployment in the technical sector) which demolished the misconception of endless development.

The ministries of education and technical universities endorsed massive studies in civil engineering. Old schools expanded and new schools were created, having numerous students. Due to the high professional prestige and remuneration, the schools attracted high quality students. The increase in the volume of projects and the scientific and technological developments led to strong specialization, both in studies and profession. Structural engineers, hydraulic engineers, transport engineers etc, all fell under the rubric of civil engineering. Trying to put order in the professional rights, different solutions were adopted in the various countries, ranging from a unified university diploma and a general professional permit to a wide spectrum of specialization of both. The issue became critical also in many other sectors. International professional unions of experts and bodies, stemming from national ones, were established; after examination, they certify not only the new comers to the profession, but also the experts' progress through time. Though in many cases these certifications have no State acceptance, they are appreciated and recognized worldwide.

In an attempt to reform university studies (not only in civil engineering) closer to the market needs, the European Union promoted the Bologna Declaration in 1999, which introduced a two-level system. The first-level degree (e.g. a 3-year bachelor) is an appropriate qualification for the market. The discussion on the Declaration is even today extensive, hot and non conclusive. Nevertheless, it should be noted that in many peripheral and less developed European countries the Declaration is vehemently opposed by both the academics and professional bodies.

Therefore, a series of critical questions arises for the ministers of education, the technical universities and the professional associations of the countries in recession:

- Why to continue producing civil engineers at the same rate, given that public and private investment in infrastructure will be substantially reduced during the next 15 years?
- How can the fresh civil engineers' employability be increased?
- How their theoretical knowledge will not become obsolete, given that the majority of them will not have the opportunity to gain experience in practice for a period after their graduation?
- How the needs of the 21st century civil engineers should be better addressed?

In this paper, a radical reform of CES in countries under recession is proposed. Following a review of the existing literature, including ASCE's Body of Knowledge for the 21st century and IPMA's Competence Baseline, it is proposed to widen the CES curriculum within the historically established and widely accepted 5-year term. In this direction and among others, it is recommended to increase the graduates professional potential and employability by:

- increasing significantly the offered modules on project management ;
- adding in CES new modules on strategy management, leadership behavior, delivery management, organization and environment etc;
- providing adequate professional training during the university studies five year period; and
- promoting fresh graduates' certification by professional bodies.

In order to exemplify the proposed lines of action, a reformed syllabus for the CES offered currently by the National Technical University of Athens (NTUA) is developed and presented.

Download English Version:

<https://daneshyari.com/en/article/1115318>

Download Persian Version:

<https://daneshyari.com/article/1115318>

[Daneshyari.com](https://daneshyari.com)