

Bachelor and/or Master Thesis in Chemical Engineering: A Way to Connect Research, Industry and Academic Learning?

Paulo A Augusto¹, Teresa Castelo-Grande²

¹ Dep. Ingeniería Química y Textil, Fac. Ciencias Químicas, Univ. Salamanca, Plaza de los Caídos, 1-5, 37008 Salamanca, SPAIN;

² Dep. Engenharia Química, Fac. Eng. Univ. do Porto, Rua Dr. Roberto Frias, s/n, 4200-465 Porto, PORTUGAL

Corresponding author: pauloaugusto@usal.es

Keywords: Master thesis (TFM); Bachelor thesis (TFG); research; industry; pedagogical enhancement

Abstract: The structure of the TFM (Master Thesis) and of the TFG (Bachelor Thesis) has been subject of intense debate in the Spanish Academy [1], especially in the Chemical Engineering Area. In fact, usually one of three different main configurations are adopted in Chemical Engineering Graduations offered in Spanish Universities: a) The design and selection of a full processing plant, including equipment design, heat and mass balances and studies of technological and financial

Fig. 1. Enhanced Methodology



viabilities; b) A research study under the chemical engineering thematic; c) a mixture of the previous two. Specially options a) and c) has been non-consensual between different universities, and inside the faculty member and students. In fact such a discussion is originated, among other reasons, on one hand from the comparison with the thesis structure and development done in many other areas of science and technology that in their large majority rely strictly on option b), and on the other hand from the professional requirements and competences demanded to exert the chemical engineering profession, as well as the complains presented by the students that consider that they are repeating procedures already learned, shown and evaluated before in other specific modules (e.g Project course) or even thesis (in the previously defended Bachelor thesis, in the case of Master students). In this work we will not enter the discussion but propose a different approach that, in the cases of universities where option c) is mandatory, may enhance it and thus may conjugate student vision and goals, enterprise needs and maintain the structure desired by several faculty members. The methodology that was followed is detailed in Figure 1 and presents an initial student-teacher approach as successfully done in [2]. Results obtained after applying this methodology in several case studies and results will be show and discussed and involve among others: a) satisfaction enquiries of all the actors involved (teacher, students, and when it is the case, the interested industry); b) scientific publications / presentations (e.g. [3]); c) targets feedback. Besides these qualifying results we may also stand out the following ones: I) improvement in the CV of the students; II) improving students' contact with real industry applications and needs; III) real case studies; IV) happiness of all the actors involved; V) improving CV of the thesis director and industrial connection; VI) making available a possible improvement for industries, or even the launch of spin offs.

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