

Outcome Analysis of a New Informatics Curriculum

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One of the elements of the ongoing Bologna process of harmonizing the European higher education system is to describe and develop study programs from an outcome perspective. Curricula are to be specified by the learning outcomes, i.e. the knowledge, skills and competences the graduates have acquired after successful completion. Therefore, competence profiles are essential parts of all accreditation procedures. With the advent of the European Qualification Framework (EQF) which allows to categorize all vocational and academic degrees in a linear structure of eight layers, competence profiles will become even more important, since competence descriptions will be used to map a specific degree to one of these layers. While it is rather easy to list those target competences, it is more difficult to prove that a curriculum actually achieves these goals, since many of these competences are hard to assess. This is especially true, when a new curriculum is being introduced.

This contribution describes the application of a method called "ACQA (Academic Competences Quality Assurance)", developed at TU Eindhoven, to a Bachelor/Master curriculum in Informatics at TU Berlin. The method uses a conceptual framework consisting of seven competence areas each of which is subdivided into six to ten competences or learning outcomes. For each teaching module of the curriculum, these outcomes are ascertained, based on structured interviews with the responsible teachers. The results per module are then aggregated as a weighted average leading to the competence profile of the entire program (Figures 1 and 2). By doing so, we only obtain the target profile as the accumulation of module profiles intended by the teachers. Therefore, the method has to be regarded as a first step of a more complete analysis that would include as further steps interviews with students, interviews with alumni and also with employers of these alumni to find out if there are differences between intended competence profiles and perceived actual profiles.

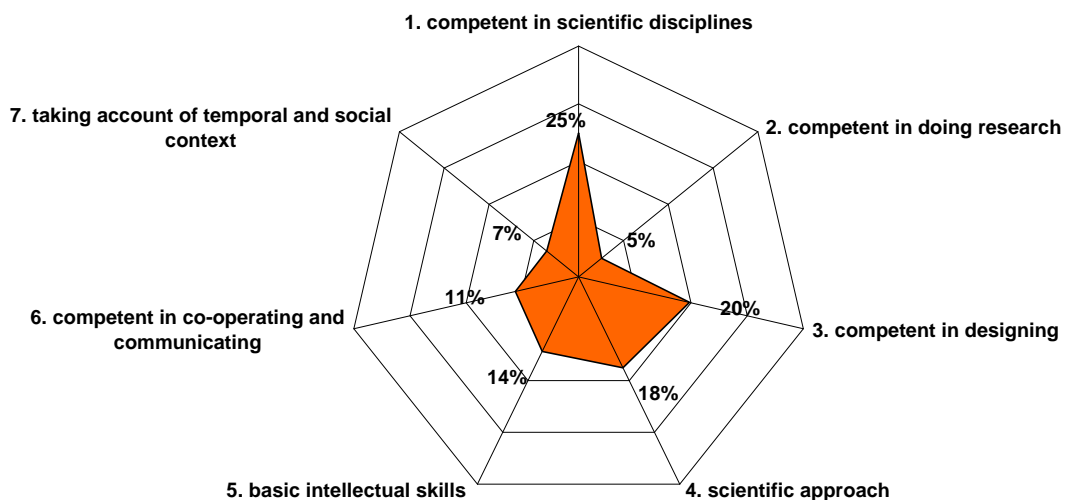


Fig. 1: Competence Profile of the Informatics Bachelor Program of TU Berlin

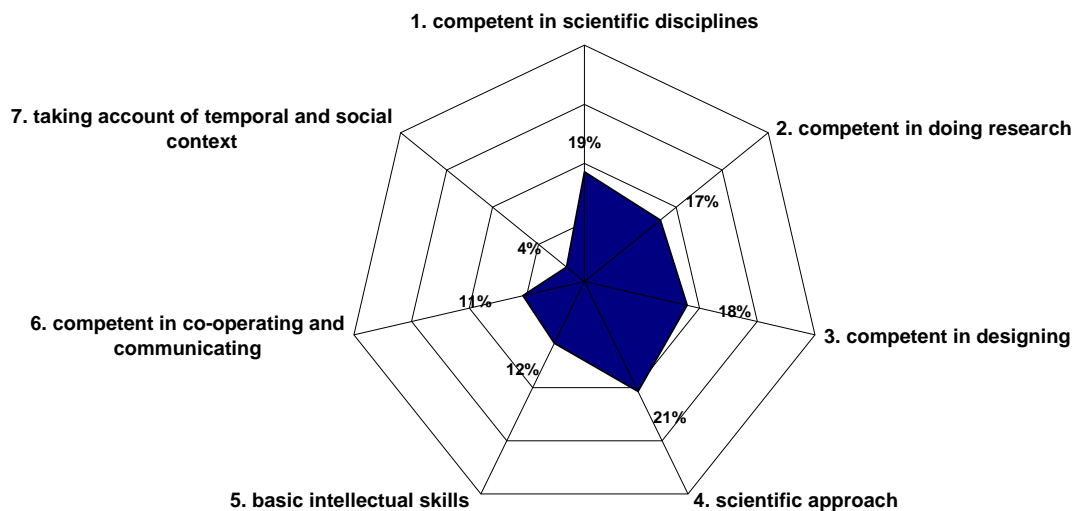


Fig. 2: Competence Profile of the Informatics Master Program of TU Berlin

The particular competences are quantified not only in terms of *workload* (hours) attributed, but also in terms of the *depth* of treatment. Also a distinction is made between competences that are *addressed* in teaching and competences that are *examined*, which in most cases are not congruent.

For the manager of the study program examined, the analysis gives a valuable feedback about the program's profile and the extent to which individual teaching modules contribute to specific competences. It gives some evidence, whether or not the asserted overall profile is substantiated by the accumulated module profiles. It also helps when composing modules to study programs to check whether the outcomes of a preceding module fit the income requirements of the succeeding module.

As an important side effect, the method also forces the teachers of the modules to reflect on learning outcomes, didactic approaches, types of exams and contents more thoroughly. For instance, he or she may realize that there is mismatch between asserted competences, educational elements employed, and the type of assessment. It helps to perform the transition from a teaching-centric to a learning-centric approach, which hopefully will lead to better teaching.

The cost of the analysis consists of some royalty to be paid to the developers of the method which includes basic methodological training for the persons performing the analysis, and the personnel cost of the analysis itself. The first study program analysis performed at TU Berlin needed 4-5 person months, now after some training and experience it can be done in half the time. (Not included in the cost is the time teachers spend for being interviewed or filling in questionnaires.)

Since the analysis was done only recently and since the results more or less confirmed the programs' intended profile, it did not have any impact on the curriculum yet. The next step that we currently prepare is to ask students similar questions and contrast the teachers' intentions with the students' perceptions, which will give further insight into the validity and usefulness of the method.

Reference:

Criteria for Academic Bachelor's and Master's Curricula
http://w3.tm.tue.nl/uploads/media/AC_ENG_web.pdf