

A multicampus faculty in 6 cities

1 common view and 6 distinctive features thanks to learning paths

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INTRODUCTION

To implement the Bologna declaration on the European space for higher education (1999), Flanders has adapted its legislation (2003) and introduced the concept of associations of universities and university colleges. 12 institutions have joined their forces in the KU Leuven Association. Six of them organize Bachelor and Master programmes in Engineering Technology (*Fig. 1*). Starting from the first of October 2013 the new faculty of Engineering Technology of KU Leuven (FIIW) will be responsible for all curricula in Engineering Technology, organized at seven different campuses. These are: a unified Bachelor programme, eight Master programmes, two master after master programmes and one Erasmus Mundus programme, organised at one or more campuses.



Fig. 1 The six institutions of the KU Leuven Association which organize programmes in Engineering Technology for the moment: KHBO, KaHo Sint-Lieven, Thomas More Mechelen, Thomas More Kempen, GroepT and KHLim.

Institutional mergers in Higher Education are a common phenomenon in several countries [1]. The drives of these mergers can be quite different. In this case the strong collaboration is driven by the academisation of the degrees of Bachelor and Master of Science in Engineering Technology. Up till now, these programmes are the

responsibility of University Colleges, but from October 2013 they will be organized by universities. This ‘academisation’ should not be interpreted in a classical way as Harwood [2] defines: “a cognitive shift whereby basic sciences and mathematics come to play a more prominent role in the curriculum.” Our curricula remain focused on practical applications, but there should be a shift towards more research-based education inducing a stronger research profile for students and staff. The multicampus context of this vertical merger of an established university as KU Leuven with six university colleges, with a long tradition in engineering education and spread all over Flanders, makes it very challenging. As Harman [3] states “The degree of integration desired in the newly created institution and the extent to which particular elements are retained from the different cultural traditions, are important consideration for leaders”. It’s our goal to take advantage of these ‘differences’ and to put into practice some possible positive benefits of mergers found in literature, such as greater differentiation in course offerings for the students [3], sharing knowledge and expertise at several levels [4] and creating greater academic depth and diversity [3].

In this paper we describe how we try to optimize in FIW the supply of strong academic programmes, conceived in such a way that students have an increased choice and lecturers can share knowledge and expertise. Despite the dispatching of the students over six geographical locations, the degrees are identical and the learning outcomes which should be achieved are the same, comparable with for example the situation in the Jerusalem College of Technology [5]. The multicampus aspect of our faculty forces us to develop well-structured curricula with a common basic framework, preserving the ‘uniformity’, and some extra campus-specific issues on top, allowing each campus to create a distinct profile. All this is based on learning paths. A learning path can be roughly defined as a set of one or more learning activities leading to a particular learning goal. In e-learning learning paths are made adaptive in order to meet the varying student needs and contexts [6]. We develop our learning paths in a learning system that starts in a very traditional way, where all the learners are provided with the same learning content. But at the end of the programme, the learning paths become more adaptive responding to the students preferences through optional courses depending on the campus where they will study (*Fig.2*).

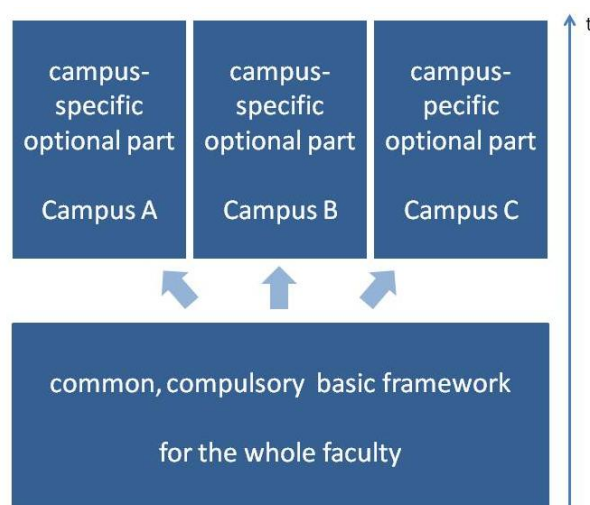


Fig. 2. Learning path fans out in time.

1 BACHELOR PROGRAMME IN ENGINEERING TECHNOLOGY

The Bachelor programme in engineering technology takes three years (six semesters) and has five different major subjects which can be chosen after three semesters: civil engineering, chemical engineering, electromechanical engineering, electronics and ICT engineering and polymer processing engineering. Not all major subjects are organised at all six campuses, but at every campus the curriculum starts with common basic core courses during three semesters (*Fig. 3*).

6	chemical	civil	electro-mechanical	electronics and ICT	polymer processing
5	chemical	civil	electro-mechanical	electronics and ICT	polymer processing
4	chemical	civil	electro-mechanical	electronics and ICT	polymer processing
3	common basic courses				
2	common basic courses				
1	common basic courses				

Fig. 3. The structure of the three years Bachelor programme: common basic courses during three semesters, followed by one of the five major subjects during the following three semesters.

We guarantee two possible ‘smooth’ campus-switches for every student: in the middle of the bachelor programme and at the end of the bachelor programme when they choose their master programme. However students are not forced to be mobile. If they prefer to remain at the campus where they have started their studies, this is of course perfectly possible.

1.1 Campus change after three semesters – start the study near home

According to the study of James and Mingchu [7], the proximity of home city to campus has significant positive relationship with first-year students’ persistence. FIW has a campus in every province of Flanders. On every campus, whatever major the student chooses, the curriculum of the first three semesters is identical for all students on that campus. Moreover this polyvalent curriculum is almost identical on all campuses of FIW since the academic year 2012-2013. This guarantees that freshmen can study in the immediate surroundings of their home and switch to the campus specialized in the topics of their interest after one year and a half. The uniformity of the programmes of the first three semesters on all campuses is preserved thanks to a multicampus team of lecturers-in-charge specialised in an identical teaching field.

1.2 Campus change when the bachelor degree is obtained – a curriculum of choice for mobile students

Providing the guarantee that students can change campus without problems when choosing their master curriculum is less obvious since the attended bachelor curricula and the intended master curricula are filled with campus specific options.

We have prepared this conceivable student mobility thanks to the introduction of learning paths. It's our intention to start this curriculum of choice in 2014-1015 at full blast. In the following we will describe the methodology we have implemented to realise this multicampus, integrated curriculum development.

2 METHODOLOGY

We have developed a common set of learning outcomes for the whole faculty [8]. This is necessary since the degrees obtained at the different campuses are identical and by consequence the learning outcomes should be so. However the attainment level can differ between campuses. For example, one campus can do a lot of research on robotics and organizes by consequence some optional courses on these topics. Or another campus focuses more intensively on personal and social competences, distinguishing oneself for transferable skills. This results in the creation of a distinct profile for every campus. This differentiation is only possible, when we guarantee at the same time that all students, wherever they have studied, have common core knowledge and common basic skills, attributes and qualities. In the following we focus on this common core knowledge and understanding on the one hand and the campus-specificity on the other hand.

2.1 Common set of learning paths

For every major subject in the bachelor programme, a multicampus team of domain experts has defined a common set of learning paths for specific subject areas. For example, the team responsible for 'chemical engineering' in the Bachelor programme has defined four learning paths: process design and engineering, analysis and monitoring, biotechnological processes and industrial (bio)chemical processes (*Fig. 4*). These learning paths span the totality of the bachelor programme. In total 58 learning paths are defined in our faculty.

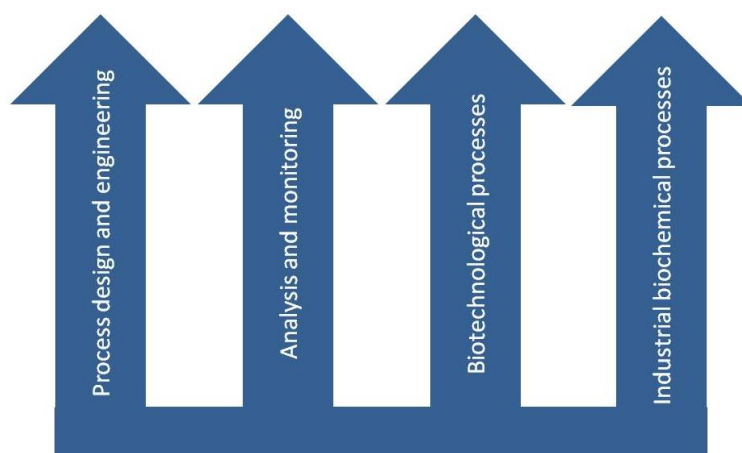


Fig. 4. The learning paths of the major subject 'chemical engineering'.

2.2 Common set of basic topics

For every learning path, a multicampus team of specialists in the specific subject area has defined a fixed set of basic topics and the associated weight expressed in ECTS points (*Fig. 5*). These topics should be treated at all campuses, ensuring the common basic framework. For example, the learning path 'analysis and monitoring' counts 10 ECTS points and contains the following basic topics: analytical basic concepts and skills, acid-base balance, buffer and titration, solution balance, titration and gravimetry, redox balance and titration, spectrometry, chromatography and complexometric titration.

2.3 Campus-specific extra topics

The experience and the research expertise of a campus influences with good reason the curriculum. The fixed set of basic topics for each defined learning path can be complemented with some extra topics based on this know how (see *Fig. 5*). The different profiles of the campuses can be made visible with the help of these extra topics.

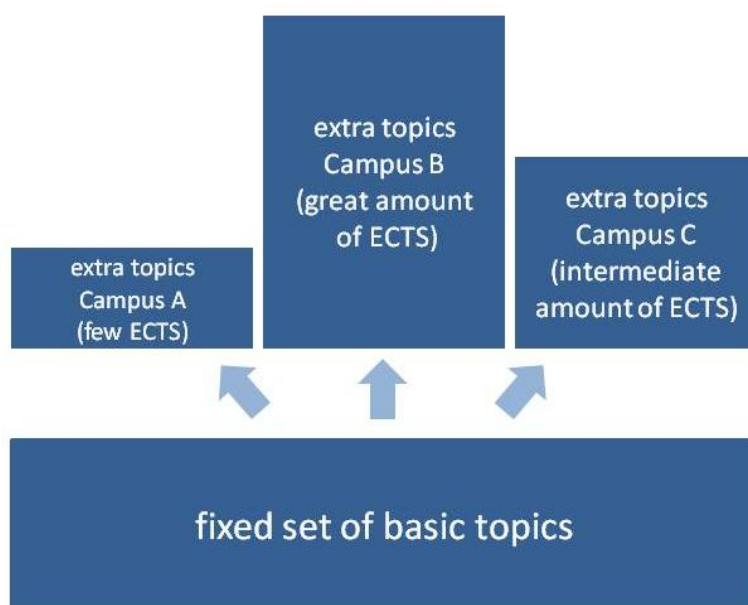


Fig. 5. Campus-specificity of the extra topics.

3 ADVANTAGES

As discussed before, the common basic framework guarantees the acquisition of the defined learning outcomes for all students wherever they study. The quality of the core requirements is established.

This common framework enables moreover student mobility within the faculty. Students can decide to continue their studies at another campus without many problems.

The choice for a specific campus can be based on the personal interests and abilities of a student. With the help of learning paths the characteristics of a campus can be made visible. They will be used in brochures to underline the richness of our faculty and the great variety of possible specialisations a student can select (see *Fig. 6*).

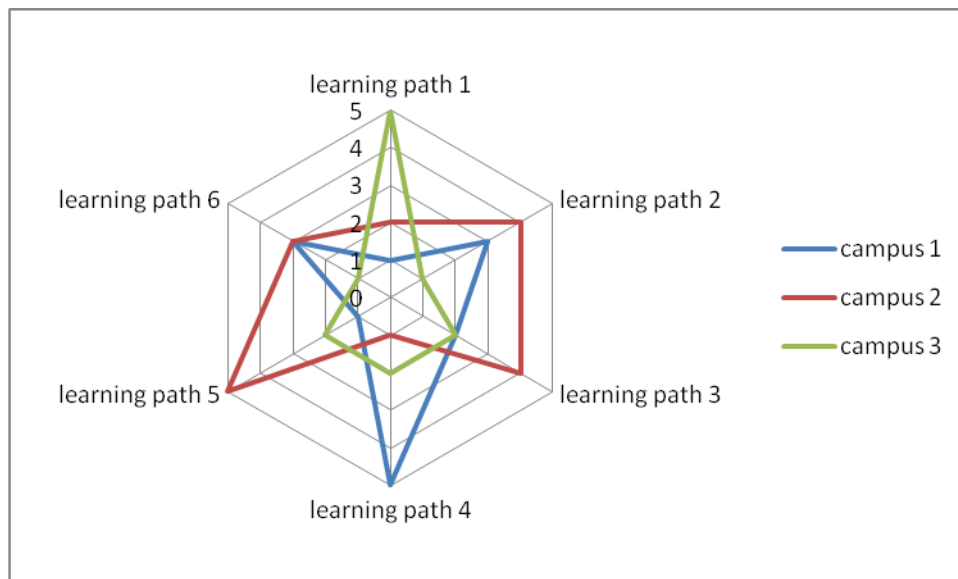


Fig. 6. Characterisation of the campuses with the help of learning paths.

Heitman [8] states ‘With the increase of the number and heterogeneity of students on one hand and the differentiation of the demands of employers on the other hand, different profiles or clusters of qualifications became functional and necessary.’ The different profiles in FIW are by consequence a benefit for all our stakeholders on condition they are properly communicated.

4 STUMBLING BLOCKS

This curriculum development is prepared by many multicampus teams. Each team focuses on one field of study and develops a corresponding learning path. There is almost no interaction between the teams in this phase of development. The preservation of an integrated view on the curriculum remains the responsibility of the campus. Time should be given to the local responsables to watch this important design element.

It’s our goal to weave the intellectual abilities and the practical and general transferable skills into the curriculum. Heitmann [9] calls this an integrated matrix approach. The acquisitions of these abilities and skills are an integrated part of courses (lectures combined with labs, exercises, design activities, projects, etc.). Four multicampus teams are focussing on the learning paths of these learning outcomes. It’s a difficult task to develop a view on this implementation.

5 SUMMARY

The new multicampus faculty of Engineering Technology of KU Leuven has defined a common set of learning outcomes. We are developing a learning path for every learning outcome and make use of this opportunity to develop a distinct profile for every campus while maintaining the uniformity of the faculty.

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