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Integrating Specific Vocational Education and Training in Higher Education – Towards Competence Development in Academic Programs

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Summary

There is a lot of debate about the integration of specific vocational education and training in higher education, especially in academic education. However, many are not aware of the fact that university education is seen as vocational education by the European Court of Justice. Apart from that it is evident that large parts of higher education are aimed at professions. Vocational, or professional, preparation of students, takes shape along three lines: subject matter, labour market requirements, and personal identity development. These three lines come together in competence development. Competence development in professional programs in higher education is practically taken for granted, although the implementation of that educational philosophy is not without problems. Competence development in academic education however faces much more debate. The contribution addresses different opinions of various stakeholders in academic programs regarding the integration of specific vocational education and training in higher education or rather the introduction of competence development in these programs. It then concludes that competence development in academic programs in not only interesting but necessary to afford students a learning environment that not only prepares them for a meaningful profession and position in the labour market, but also for a stable position in the professional community, which can save high personal, social, societal and corporate costs.

'Most people think about school-to-work as a way to reform high schools, with little role for higher education. This couldn't be further from the truth. Higher education must be a central player in the school-to-work movement. If higher education is not involved, school-to-work will not succeed.'

From: L. Olson (1997). *The School-to-Work Revolution. How Employers and Educators are Joining Forces to Prepare Tomorrow's Skilled Workforce.* Reading: Addison-Wesley, 113.

Introduction – higher education as vocational education

There is a lot of debate about the integration of specific vocational education and training in higher education, especially in academic education. Academic education should be liberal and general. However, we can make a couple of observations regarding this view.

- University studies in general fulfil the criteria of vocational training (the European Court of Justice decided on 13 February 1985, that '…any form of education which prepares for a qualification for a particular profession, trade or employment or which provides the necessary skills for such a profession, trade or employment is vocational training…' (Judgement of the Court of 30 May 1989);
- Various university studies are clearly oriented towards training for a series of professions in fields like medicine, dentistry, law, engineering, religion, accountancy, and business administration;
- The Bologna process of higher education has resulted in a common framework of Bachelor, Master and PhD studies, for which Dublin descriptors are

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developed which comprise educational outcomes at several competence levels; these outcomes also include objectives that prepare for employment;
- The Bachelor program should prepare for a qualification that prepares for the labour market; and it fact it already does for a large amount of studies;
- The accreditation of studies in higher education requires that self studies include specifications about the societal relevance of the program, which needs to be described and justified in terms of the coherence between objectives, courses, the content of courses, the assessment of student achievement and quality management.

Complexity in EU higher education systems

So, one could conclude that there is quite convincing argumentation for including specific vocational education and training in higher education. However, the situation is more complex that this.

- First of all, there are member states in which there is one comprehensive system of higher education (the UK), there are also members states with binary systems (e.g. the Netherlands), and even with trinary systems (e.g. Flanders);
- In countries with binary and trinary systems, there is much antagonism between the academic and sub-academic part. Academic studies do not want to be associated with practical studies (because this could be detrimental for their academic bachelor and master accreditation), and vocational studies stress their practicality; on the other hand, in the Netherlands, colleges for higher vocational training (HBO, hogescholen) call themselves professional university, their lectors present themselves as professors (abroad at least), and start with PhD programs (like Fontys Hogeschool in Eindhoven).
- Flanders is an interesting case in which a process of academisation is agreed; this means that second level professional higher education gets a chance to receive university funding. For this they need to prove the academic level of their program, which includes doing research and publishing in peer reviewed journals. To achieve this, these vocational colleges work together with universities in consortia. And although these studies also stress the practical identity of their programs, there will be pressure on them to generalize;
- There is a tendency to integrate systems of higher education to realize economy of scale, to soften regional competition between institutes of higher education, and to smooth vertical mobility of students.

So, although it seems obvious to align higher education with needs in the labour market, and to prepare all students in higher education for this (and for those who are interested in this for entrepreneurship), there is absolutely no consensus about this, especially not when it comes to vocational competencies. A small study in the Netherlands shows the diversity of views of stakeholders in this respect.

From vocational and professional preparation to competence development

Competence development, or competence-based academic education, faces quite a lot of resistance amongst various stakeholders in higher education (Mulder, Weigel & Collins, 2007). Nevertheless, the concept of competence development is quite popular in European (large) companies (Mulder & Collins, in preparation) and higher education. As a concept, competence management is strongly related to the selection, testing, placement and development of professionals, such as the public servants in the foreign service studied by McClelland (Spencer & Spencer, 1993) and managers, studied extensively by Boyatzis (1982). The concept of competence is not new at all (Mulder, 2007), but the institutionalised and instrumental use is. Prahalad & Hamel placed the concept in the centre of the debate of corporate values and strategy, claiming that the core competence of the organisation was largely depending on skilled staff which collectively possessed the competencies to produce the goods and services that add value in the eyes of the customers. Outsourcing key parts of the organisation faces the risk of cutting in the competence reservoir of the corporation, which could put the core competence in danger. This warning was reiterated recently by Arruñada & Vásquez (2006). The ideas regarding competence-based testing, competence development, and core competence were already implemented in higher education in the seventies of the last century. Grant et al (1979) conducted a critical analysis of competence-based reforms in higher education. They reviewed several cased in which competence-based initiatives were implemented. In many cases the motives behind the initiatives was lack of relevance, and a call for accountability. During the first experiences with competence-based (we will not go into the debate of the difference between competence and competency here) higher education critics favoured humanistic and holistic ways of education, which led to furious debates between the believers in competency-based and humanistic-based education. In various countries however, the concept of competence development was adopted in education in the eighties and the ninetees, even in nation wide or regional educational administration processes, like in the UK (where the NVQ include competencies), France (with the bilan de competences) and the Netherlands. This developed was also fueled by the need felt for the recognition of non-formal learning and assessment of prior learning (Bjørnåvold, 2000; Descy & Tessaring, 2001). In the USA the U.S. Department of Education, National Center for Education Statistics (2002) also supported competency-based education, and published the report 'Defining and Assessing Learning: Exploring Competency-Based Initiatives'. During these years a tsunami of publications appeared in which competence was studies intensively. Numerous definitions were counted, categorized and various dimensions in these definitions were identified (Mulder, 2007). Despite all diversity however, it can be observed that there are commons principles and instruments for competency profiling, assessment and development (Mulder & Collins, in preparation), also in education, using intra and extra curricular personal development plans, learning experiences, (digital) portfolios, and (peer) coaching. As said, the concept of competence in (higher) education did not have supporters only. There was, and is, a lot of criticism (Mulder, Weigel & Collins, 2007). Probably the most outspoken critic is Hyland (2006). He sees the competence movement in the perspective of reductionism and the malicious European harmonization of higher education.

Vocational orientation in academic education: views and practices

As a case study, a review of multiple practices of and perspectives on vocational preparation of students in academic education was conducted in the Netherlands during the second half of 2006 and the first half of 2007. Study programs of several universities were reviewed, a number of university professors were invited to react on the issue, representatives of student organisations were asked to participate in two focus groups, and the practices of work field committees of university programs were observed. In the next sections of this contribution, the results of this review will be presented.

Study programs of universities

Study programs were selected which were reviewed in 2000 too. The earlier review was conducted for policy development on competency-based education in one university. That review was particularly aimed at programs that were already starting or had started competence development. This review was extended with open interviews with directors of programs in the hard sciences, such as chemistry, because the idea was that those programs had the strongest resistance against vocationalism and competence development. The review that was conducted in 2006 was extended, so that a larger overview of practices was gathered. Information was collected from the Universities of (1) Maastricht, (2) Leiden, (3) Nijmegen, (4) Utrecht, (5) the Free University of Amsterdam, the technical universities of (6) Eindhoven and (7) Twente, (8) Wageningen University of Life and Social Sciences, and the (9) Open University Netherlands in Heerlen.

The information from the universities showed wide variation in the application of the concept of competence. The concept was used in the definition of academic development, curriculum design, and the use of competence-course matrices, assessment, portfolios, and coaching. Furthermore strong evidence was collected that competence development is not the prerogative of the social sciences, it is also advocated by representatives of the hard sciences. The results of the analysis will be summarised below.

What is academic development?

Three technical universities (Eindhoven, Twente and Delft) have joined forces to define academic development, and for this they divided the professional competence of graduates in three fields (see Figure 1) (Meijers, Van Overveld & Perrenet, 2005).

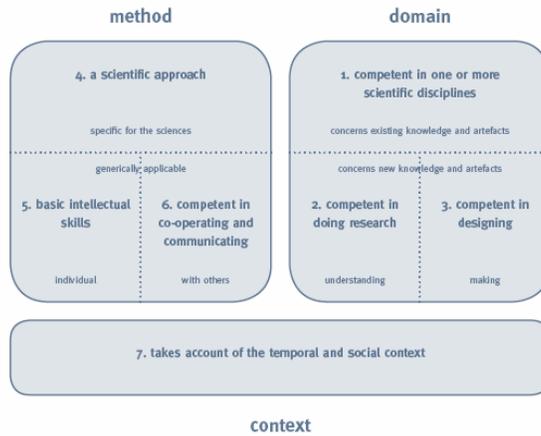*Martin Mulder, Anne Kuft, Renate Wesselink & Harm Biemans, 2007*

Figure 1. Areas of competence of a university graduate

They have distinguished domain-specific competencies, method-related competencies and the context in which graduates work. The domain-specific competencies are 1. competencies in one or more scientific disciplines, 2. competencies in doing research, and 3. competencies in designing (which is evident for technical universities). The method-related domain consists of 4. a scientific approach, 5. basis intellectual skills, and 6. competence in cooperation and communication. The context bar in the figure shows the importance graduates have to see of the temporal and social-contextual framework of their work. The domain-specific competencies are especially aimed at new knowledge and artefacts, and the method-related domain at the approach of work which is quite specific for a given science field, and at generic skills.

All 7 domains are elaborated and for each domain a set of competencies is defined, one for the Bachelor, and one for the Master program.

Academic programs can be reviewed and plotted in terms of the relative attention to the various competence domains (see Figure 2). First of all methods and content related competencies are sometimes hard to distinguish.
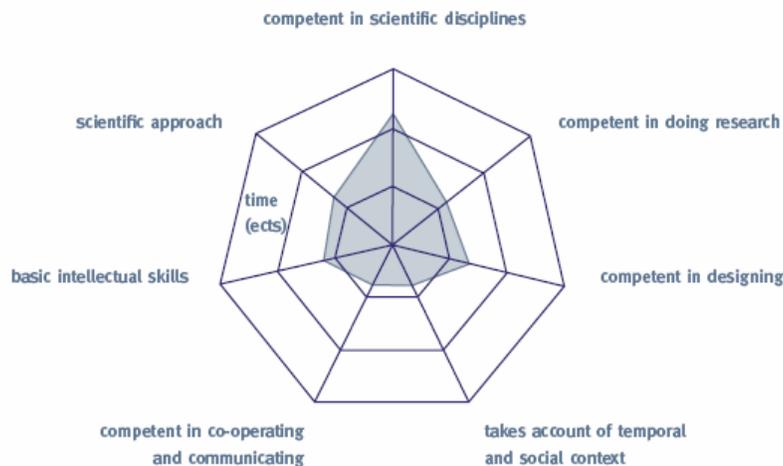
Figure 2. An example of a spider web indicating the relative attention in terms of study time to the various competence domains in academic study programs

This model was well-received by various universities, and various teams tried to adopt the model, which in some cases also resulted in problems, which is understandable since there are several overlaps between the categories in the model. Furthermore, the model does not specify curriculum design implications, it merely addresses the what (which competencies should be developed), and not the how (to develop the competencies) question.

Curriculum design

Various university programs are built on competency profiles, such as industrial design, business administration and psychology, although there are also programs that use principles of competence development without explicitly referring to them, such as chemistry. The Open University Netherlands has had a positive education visitation because of the clear educational (competence-based) concept of the program. The development of knowledge, skills and attitudes is balanced in major components of the programs, such as theory, research, diagnostics and intervention methods. Explicit models of study tasks and assessments form the core of the program, however, there are limiting constraints as to the assessments which lead to practical trade-offs between costs and opportunities implied. The Open University Netherlands not only uses the competence concept in psychology, but also in technical computer science and environmental and natural sciences, and not only in the soft domains such as communication, organisation and policy, but also in harder skills areas like computer programming and mathematics and modelling. Although some like to refer to competence as professional competence, it is not new to apply the concept of competence to certain disciplines, like Gelman and Greeno (1989) did for mathematical competence.

More on competence development in the hard sciences

Since the three universities of technology developed their competence model for bachelor and master programmes, it could be concluded that the technical sciences are in favour of competence development in the programs. The general idea also is that professional programs are naturally competence-based, but what does this educational concept mean for the social and natural sciences? Here the story is somewhat mixed. As said, there are programs like chemistry which are competence-based. Sometimes these are referred to as programs with academic skills for which learning lines are developed. The idea behind this is that students in secondary education acquire more and more study, cooperation, information, project and computer skills, and that these can be utilised in higher education. Furthermore, competencies like communication, literature search, debating, reflection and critical thinking are not developed in one course of say 6 credits. These are competencies that need to be developed over time and should come back in the program at different moments. This is also an issue in the three universities of technology which are working at a University Paper, which is an assessment nearly at the end of the programme to evaluate whether the students

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possesses the required competencies. A professor of social sciences however states that competence-based education does not play a role in his university. The educational philosophy of that program is 'research-based learning', which means that students are gradually included in the community of learners (teachers and students who do research). For the academic skills (research, academic writing, and presenting) the staff developed learning lines. The representative of this program concludes with the observation that the program is certainly working with competencies, but it is not the basic educational philosophy. A representative of the exact sciences (mathematics, physics, etc.) of the same university however states that students need to become gradually more responsible for their own competence development. Teacher interviews were held to identify the contribution of the course to the development of the most important competencies represented in the Dublin descriptors. This approach is related to the topic of the following section, on competence-course matrices.

Competence-course matrices for accreditation processes

The use of the competence concept is not only linked to the identification of competencies for curriculum design and implementation (pro-active). There are also programs in which competencies are detected for justification and accreditation processes (re-active). This is not inferior however, since practically all programs existed before the competence-philosophy was introduced. Also, these programs have to be accredited, and therefore many of them analysed the competence literature and tried to describe the extent to which courses in the program (or more general: study components) addresses the competencies listed. In many cases competence-course matrices were used for this, resulting in detailed specifications of contributions of courses to competencies. In some cases study time allocated to specific parts of competence development was determined by course, and summed, showing the time spent on the development of various competencies. Those directly involved with this exercise found this quite bureaucratic, much paper work, distracting from day-to-day education, and not linked to reality. In this case, competence identification and mapping was not followed by curriculum (re) design for the implementation of learning lines for competence development. This is also not always very easy, especially not in small programs (with only a limited number of students) with common courses for different programs. In these cases competence development is difficult to plan, and should be flexible and left to the responsibility of the individual student, with a certain amount of control by the students advisors. But the exercise helped in making the program more transparent for evaluators.

Assessment, portfolios, coaching

University programs that have introduced competence development initiatives for their students typically work with competence assessments, portfolios and coaching. The extent to which coaching is provided differs from case to case. Competence assessment also differs as to the type of assessment. Some programs use entry-assessments, others use self-assessment, peer assessment, and multi-rated feedback. Some have introduced it as an option, others have integrated it in courses. Portfolios also differ, and can vary from collections of evidence of academic achievement, self-

reports and reflections, and IT-supported technology for digital portfolios (with again different levels of elaboration). In general students are asked to do an assessment, this is discussed, a development plan is composed, various learning activities are planned and carried out, the results are compiles in portfolios and the progress is discussed with others, either teachers, coaches or peers.

University professors about competence-based education

The next step in this study was a consultation of professors who were asked what they think about competence-based academic education. Twenty-two reactions were received which were analysed qualitatively, using a hermeneutical method of text interpretation. The reactions were then categorised by central representations of fundamental views on competence-based academic education, and these varied from the difference between espoused theories of higher education, theories-in-use, the limited use of course-competence matrices which are frequently used to align outcomes and program content, the validity and reliability problems regarding competency profiles, the skewed attention of competency-based education towards vocational skills, the need for academic skills, the general nature of natural sciences, to the importance of student portfolios and the integration of academic skills in programs, the relationship between basic knowledge and analyzing and solving complex problems, etc. Views differed from the competence-based education philosophy not being functional, time consuming and not discriminating, being too much vocationally oriented. Also, faculty thought that basic knowledge and academic skills are needed, some warned for bureaucracy, and emphasised diversity in the sense that their programs do not have specific employers. Still others stated that competence development is important as supplement to subject matter knowledge, or pointed at the necessity for paying attention to competencies given the accreditation process, and the importance of the improvement of quality of learning (in stead of improving the quality of education). Still others pointed at the importance of vocational skills and the role of certain program elements which are aimed at those skills (such as projects, problem-based learning, etc.), or stated that the necessity of competence development is evident and that competence-based education should be implemented in an efficient way. In short, the range of reaction varied from (quite) critical (about 1/3 of the reactions) to (very) positive (about 2/3 of the reactions).

An important question then is how to address the personal educational beliefs of university professors. They hold the responsibility for the education of their chair, but in many universities they do not need to be trained in teaching and educational research. So chances are high that they see education as an activity that one can do with pleasure, but also with less academic rigour than the research in their own field. In many cases they are not informed about educational research and development, at least not to the extent to which they are in their own discipline. This may also be neither necessary nor feasible, but it can explain resistance against the integration of specific vocational education and training in academic education.

Representatives of student organisations

Interesting to see is also what student bodies (especially study associations) think about the vocational preparation within the studies they are representing. Two focus groups were conducted with education commissioners of study associations, representatives of student organisations (such as Aeisec, Integrand, Students for Entrepreneurship) and student representatives who have a seat in departmental boards, committees and councils, both a program and university level, so students who are active in educational policy making and evaluation. In total eighteen students participated, representing study organisations in fields like management, entrepreneurship, consumer studies, international development, environmental studies, landscape planning and design, technology, and international land and water management.

First of all the students were asked to mention vocational competencies they think are important for preparation for the labour market. This open question yielded the following list of abilities, characteristics students need to have, representations of what they need to be and two other 'competencies'. Apart from the question as to whether all items are really competencies, the list is interesting to review when the inclusion of vocational education in academic programs is at stake.

Table 1 ' Competencies' deemed relevant by representatives of student organisations (n=18)

Able to communicate Able to explain Able to listen Able to give feedback on oneself and on another Able to work together Able to explain choices Able to network Able to sell yourself Able to convince Able to write an application letter Able to motivate people Able to make decisions Able to think in frame works Able to clearly define matters Able to see the overall picture Able to manage projects	Have conference/meeting skills Have guts Have self-knowledge Have insight into character of people Have a strong energy Have content-specific knowledge Have your own goals Have ambition Have determination Have patience Have ideas Bring in ideas
Be open to other people and other ideas Be critical Be assertive / ask for attention Be self secure Be representative Be persistent Be practical Be thorough Be precise Be solution minded Be enterprising Be enthusiastic	Take on everything Work hard

Next, the students were asked to what extent their program is aligned with the needs of the labour market. As expected, communication skills ranked high in the discrepancies between program content and labour market requirements. This is also confirmed by various labour market studies amongst alumni. Students mention that

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although writing skills and oral presentation skills are included in the curriculum of their programs, the diversity of the student influx creates problems. Students coming from colleges of higher vocational education (HBO) state that they need more guidance in developing scientific writing skills. On the other hand, the university expects these students to have developed sufficient communication skills within their previous program (at HBO), and therefore does not give much attention to developing their vocational skills, which then creates a differential program-needs mismatch.

The students also mention special courses in which they learn to conduct interdisciplinary research in project-based education. The projects are commissioned by external private or public organisations, and the students are expected to develop a solution for a given (real) problem situation. In these projects students say they learn skills for project management, communication skills, skills for working in a team, and for an external organization. In principle, these skills are found to be very worthwhile, although the way in which problem-based education is implemented is criticised because of the fact that there can be too many group activities which come with free-ridership, or which lead to planning problems if group work for different courses needs to be done in parallel. But also, education on communication skills is sometimes presented too late in the curriculum. For instance, the special courses on interdisciplinary research are planned near the end of the program in many studies. The reason for this is that the idea is that in an earlier stage students do not have enough content-specific knowledge to work in an interdisciplinary team. Another point of concern is that communication skills in problem-oriented courses earlier in the program, while unexpected, can get too little attention because too little feedback is given on communication and cooperation issues and are not stimulated to reflect on these aspects. The emphasis in these courses is on the content, which is not surprising given the fact they are all discipline-oriented. The same holds for content-specific courses in which students get many chances to practice vocational skills, such as oral presentation skills. However, within these content specific subjects there is no room for reflection on vocational skills, feedback is also only given on the content. Students also state that various teachers do not have the proper presentation skills themselves, and can therefore not give feedback on others about their performance. To make it even worse, when teachers do give feedback on vocational skills, such as report writing, they have different views on what is the right way, which causes much confusion. Participants in the focus groups also mentioned however, that there is some doubt about the willingness of all students to receive feedback on their work. In some cases, reports on which a lot of feedback is given are sometimes not even picked up. In short, it can be said that all associations agree that receiving proper feedback is a very important aspect of developing vocational skills. Already many moments exist within curriculum where various skills need to be applied. Giving feedback on the proficiency of these skills, and not only on the content of the course, would further help students to develop these skills.

The student associations think that it is mainly the students' responsibility to develop the competences necessary in professional practice. Therefore, the students need to be made more aware of the need of this development. The university can assist in this awareness raising but it should not limit its curriculum to competence development.

In order to become more aware of the need to develop certain vocational skills students need to relate to their working field. Student associations and the university

can for this goal organise activities for students to make contact with graduates and future employers.

Implementation of assessments is perceived to be very valuable for academic development and development of vocational skills by the student associations. More reflection and feedback however is desired. Students are open to different methods of assessment as long as competence development does not take over the whole curriculum.

Finally, it should be kept in mind that there is great diversity in the student population. International students, national students coming from a college of higher vocational training, and national students having completed pre-university secondary education or an academic bachelor, all have different backgrounds and therefore different levels of vocational skills when starting their programs.

In total student representatives:
- perceived competence development as being relevant for their program;
- valued the alignment between their program with the needs of the labour market;
- thought the transition of university to work to be an important issue to address both a the level of intra and extra curricular activities;
- believe it is the joint responsibility of the students and the university to take care of vocational preparation;
- are positive about the activities of their associations such as the contacts with potential employers for student competence development;
- value views of employers on competence profiles of graduates;
- and value competence assessment within the programs.

The views of faculty and student associations are interesting to know, as they represent the personal educational believes which influence teaching and learning behaviour, but apart from that there are of course many (formal) regulations within university programs, and the accreditation requirements which warrant to a certain extent that these programs are aligned to societal needs and address, to a varying degree, certain vocational preparation.

Activities of work field committees

To enhance the societal relevance of programs, many of them work with work field committees, and in some cases this is even mandatory in the university. These work field committees can play an effective role in informing the program about developments in the field of study. Of course, professors and teachers have their own contacts with practice, for instance by supervising students, doing contract research, giving advice, or facilitating workshops, or even fulfilling commissioner roles within companies. Some have their own company or a part-time appointment in practice. The work field committees however are a systemic provision for having contact with practice, but then they need to function as intended. A small review of over twenty of these committees (for which the information was given by course directors) reveals that there is room for improvement.

Conclusions

The contribution concludes with the observation that careful attention has to be paid to the vocational preparation of university students to prevent situations in which they graduate and do not know what job to seek and find (which happens and can lead to frustration and marginalization on the labour market). This vocational preparation however needs to vary in specificity given the differentiated nature of the academic programs and their differential relationships with sectors and professions.

Looking back to the various contributions of universities, professors, student organisations and course directors, it can be concluded that there are basically two responses to the issue of integrating specific vocational education and training in higher education, especially to competence development in academic programs, varying between antagonism and ambition, reflecting positions of tradition ('we should stay as academic as possible') and ambition ('how can we design the academic curriculum in such a way that academic education and competence development can strengthen one another in order to prepare balanced young professionals).

It is obvious that international developments, national jurisdiction and institutional regulations are in favour of integrating vocational elements in the academic curriculum and to adopt competence development as part of the curriculum (which is different from redesigning the curriculum based on competencies). The extent to which, that is the question. A certain balance between the knowledge component (which serves as the foundation of the competence professional), skills (to apply that knowledge) and attitudes (called generic competence in many European initiatives for the harmonisation of higher education) is necessary, and this should be looked after with great care.

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