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JAKE MURDOCH AND JEAN-JACQUES PAUL

CONTENT AND PROCESS OF STUDY, COMPETENCIES UPON GRADUATION AND EMPLOYMENT

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1. INTRODUCTION

In studying the relationships between higher education and graduate employment and work, we are not merely interested in variations of employment and work according to the easily available structural information, i.e. countries, fields of study, type or level of degree, or any kind of quality ranking of institutions, as it was the case in most of the studies undertaken hitherto, but we also like to find out, what has been emphasized less frequently in the past (see Kogan and Brennan 1993; Brennan, Kogan and Teichler, 1995), i.e. the extent to which the ways the institutions of higher education shape the study processes and the substance of study are relevant for the students' competences upon graduation and eventually for their subsequent employment and work. We do not want to be confined to the question often raised "Does College Matter?"; we also ask "Does Programme Matter?" (cf. Schomburg and Teichler, 1993).

Ample research has been undertaken on the impacts of college, notably in the United States of America (cf. the overview in Pascarella and Terenzini, 1991), but in other countries as well. There did not emerge, however, any instrument generally accepted by the experts in this field for measuring the competence-relevant environment of higher education institutions or their departments. In an internationally comparative study, it is even more difficult to agree on the best possible measures, because we do not only observe different educational environments in different national higher education systems, but we also have to take into account divergent views between countries as regards the most important dimensions to be chosen for analysing an educational environment in higher education. Under these circumstances, we decided pragmatically to employ measures of teaching and learning modes in higher education which had been developed and frequently employed in studies on internationally mobile students and had turned out to be fruitful in this context to compare educational environments internationally (cf. Opper, Teichler and Carlson, 1990; Maiworm, Steube and Teichler, 1991). In addition, we developed within the CHEERS research team an instrument, i.e. a question comprising a long list of items for measuring the study provisions and study conditions, taking into various prior studies (notably Teichler et al., 1987), with a list of major descriptors of the study conditions and provisions. As some of the themes newly addressed in the latter question should be rated in comparison to the themes already addressed in the former question, some items were employed in the latter which are similar or identical to some of the former question.

This chapter, first, deals with the modes of teaching and learning emphasised by the graduates' institutions of higher education, or more precisely within course programmes the respondents graduated from, as well as the quality of the study provisions and conditions, as they are perceived by the graduates retrospectively. In this framework, we examine the extent to which the countries analysed, the fields of study as well as the types of degree programmes differ according to major dimensions of teaching and learning modes as well as study provisions and study conditions. Second, we try to establish the impacts of the modes of teaching and learning and of the study provisions and study conditions on the competencies acquired up to graduation according to the graduates' retrospective assessment and on the income about four years after graduation, i.e. at the moment the survey was conducted in eleven European countries and Japan.

2. MAJOR DIMENSIONS OF TEACHING AND LEARNING MODES

The graduates had been asked to rate retrospectively which modes of teaching and learning were emphasized at the institution they had graduated from and thereby in the course of study they had been enrolled. They had been provided a list of 12 items and had been asked to rate them on a five-point scale from 1 = "to a high extent" to 5

= "not at all". The graduates of all the countries surveyed believe that theories, concepts and paradigms have been most strongly emphasized, followed with a quite a distance by independent learning, writing a thesis, and facts and instrumental knowledge. The graduates place the following items on average close to the middle of the five-point scale: regular class attendance, teacher as the main source of information and understanding, freedom

to choose courses and areas of specialisation, project and problem-based learning, and detailed regular assessment of academic progress. Finally, graduates believe that out-of-class communication and direct acquisition of knowledge has been emphasized least on average.

According to country, the average ratings of the graduates were most homogeneous, as far as the emphasis on the teacher as the main source of information and understanding, and on theories, concepts and paradigms are concerned. In contrast, the most striking differences of the national environments of teaching and learning become visible with respect to the emphasis on facts and instrumental knowledge (least emphasized in the Czech Republic, Italy and Spain) and in the assessment modes (most emphasis on writing a thesis in Italy and least in Spain, most emphasis on detailed regular assessment in Sweden and least in Austria and Italy).

Table 1. Emphasis Placed in the Course of Study on Modes of Teaching and Learning as Rated Retrospectively, by Graduates by Country (arithmetic mean*)

	Country													Total
	IT	ES	FR	AT	DE	NL	UK	FI	SE	NO	CZ	EUR	JP	
Theories concepts or paradigms	2.1	1.8	2.2	2.0	2.2	2.3	2.0	1.7	1.9	1.8	1.7	2.0	2.1	2.0
Independent learning	2.1	3.2	2.5	2.4	2.4	2.2	2.1	2.2	2.2	2.1	2.5	2.4	2.9	2.4
Writing a thesis	1.0	4.0	2.5	2.8	2.7	2.2	1.9	2.3	2.5	2.7	2.8	2.5	2.2	2.5
Facts and instrumental knowledge	3.5	3.5	2.7	1.9	2.1	2.5	2.1	2.7	2.0	2.3	3.4	2.6	2.5	2.6
Out-of-class communication between students and staff	3.9	3.6	3.2	4.2	3.8	3.7	3.2	4.0	3.7	3.5	4.0	3.7	3.5	3.7
Regular class attendance	2.5	2.5	3.3	3.0	2.8	2.7	2.2	3.1	2.9	2.9	2.9	2.8	2.4	2.8
Teacher as the main source of information and understanding	2.9	2.6	2.9	2.9	3.0	2.8	2.9	2.9	3.0	2.8	2.8	2.9	3.2	2.9
Freedom to choose courses and areas of specialisation	2.8	3.2	2.9	2.7	3.0	3.0	2.6	2.6	3.2	3.3	3.0	2.9	2.4	2.9
Attitudes and socio-communicative skills	3.5	3.7	3.2	3.7	3.7	2.7	2.8	3.4	3.1	2.8	3.1	3.2	3.3	3.2
Project and problem-based learning	3.8	3.5	3.2	3.5	3.4	3.3	2.6	3.3	3.0	2.7	4.2	3.3	2.9	3.3
Detailed regular assessment of academic progress	4.1	3.7	3.6	4.2	3.4	3.4	2.5	3.8	1.8	3.5	3.1	3.4	3.0	3.3
Direct acquisition of work experience	4.3	4.3	4.0	4.2	3.9	3.0	3.7	3.6	3.4	3.2	4.0	3.8	4.0	3.8
<i>Index variables</i>														
Practical learning	3.8	3.7	3.3	3.5	3.3	3.0	2.7	3.3	2.7	2.9	3.6	3.3	3.1	3.2
Free choice	1.9	3.6	2.7	2.8	2.8	2.6	2.2	2.5	2.8	3.0	2.9	2.7	2.3	2.7
Structured teaching	2.7	2.6	3.1	3.0	2.9	2.8	2.6	3.0	3.0	2.9	2.9	2.8	2.8	2.8
Theory	2.1	1.8	2.2	2.0	2.2	2.3	2.0	1.7	1.9	1.8	1.7	2.0	2.1	2.0
Count (n)	3102	3009	3017	2291	3497	3047	3418	2657	2621	3311	3090	33059	3407	36466

Question B8: If you look back to your course of study that you graduated from in 1994 or 1995: to what extent were the following modes of teaching and learning emphasised by your institution of higher education and its teachers? *Scale from 1 = "To a very high extent" to 5 = "Not at all".

In employing a factor analysis, we established four indices of teaching and learning modes (see Table 1), where each of the indices corresponds to the weighted sum of the scores of the variables of which it is made:

- "Practical learning" based on the items direct acquisition of work experience, attitudes and social communicative skills, project and problem-based learning, facts and instrumental knowledge as well as detailed regular assessment of academic progress;
- "Free choice" using the items freedom to choose courses and areas of specialisation, and writing a thesis;
- "Teaching", drawing from the items teacher as the main source of information and understanding as well as regular class attendance;
- "Theory" corresponds to the item theories, concepts and paradigms.
- The findings will be discussed below after the measure of the educational environment, i.e. the study conditions and study provisions, have been introduced.

3. MAJOR DIMENSIONS OF STUDY PROVISIONS AND STUDY CONDITIONS

Graduates have been also asked to rate retrospectively the conditions and provisions which they had experienced in the study programme they had graduated from about four years prior to the time they were surveyed. They have been provided with a list of 18 items they have been asked to rate on a five-point scale

from 1 = “very good” to 5 = “not at all”.

As Table 2 shows, most graduates from the 12 countries consider retrospectively the contacts with fellow students as good. They also tend to appreciate the course content of the major as well as the library equipment and stockings and finally the variety of courses offered. In various respects, they view the study conditions and provisions as neither good nor bad on average: the teaching quality, the supply of teaching material, the assistance for the final examination, the design of the degree programme, the testing and grading system, the opportunities to choose courses and areas of specialisation, the academic advice offered in general, and finally the quality of the teaching equipment (e.g. computers). The ratings are less favourable on average as regards the practical emphasis of teaching and learning, the opportunities of out-of-class communication with the teaching staff, the research emphasis of teaching and learning, the chance for students to have an impact on university policies, the provision of work placements and other ways of work experience, and finally the chances to participate in research projects.

Most of these items vary to a similar extent according to country. The highest variation can be noted with respect to the provision of placements and other work experience which, according to the graduates, has been least provided by course programmes in Italy and Spain.

With the help of a factor analysis, six indices were created for the study provisions and study conditions:

- “Content and design” relies on the items variety of courses offered, opportunity to choose courses and areas of specialisation, design of degree programme as well as course content of major.
- The second index, “quality of teaching and advice”, uses the items academic advice offered in general, assistance/advice for your final examination as well as teaching quality.
- The third index, “equipment”, is based on equipment and stocking of libraries, supply of teaching material as well as quality of technical equipment.
- The fourth index, “research”, is based on chances to participate to research projects as well as and research emphasis on teaching and learning.
- “Practical experience” is the fifth index which has been created, using provision of work placements and other work experiences well as practical emphasis of teaching and learning.
- The last index, “communication”, has been elaborated on the basis of contacts with fellow students, chance of students to have an impact on university policies, as well as opportunity of out-of-class contacts with teaching staff.

Table 2. Quality of Study Provisions and Study Conditions at the Course of Study as Perceived Retrospectively, by Graduates by Country (arithmetic mean*)

	Country													Total
	IT	ES	FR	AT	DE	NL	UK	FI	SE	NO	CZ	EUR	JP	
Contacts with fellow students	2.3	2.1	2.3	2.0	2.0	2.1	2.1	2.0	1.8	1.7	2.0	2.0	2.6	2.1
Course content of major	2.7	2.8	2.4	2.6	2.7	2.4	2.1	2.4	2.3	2.7	2.5	2.5	2.4	2.5
Equipment and stocking of libraries	3.1	2.7	2.8	2.5	2.8	2.4	2.5	2.2	2.3	2.2	3.0	2.6	2.3	2.6
Variety of courses offered	2.7	2.9	2.4	2.4	2.7	2.3	2.3	2.7	3.4	2.8	2.9	2.7	2.8	2.7
Teaching quality	2.8	3.1	2.7	2.7	2.7	2.7	2.3	2.8	2.8	2.8	2.5	2.7	3.4	2.8
Supply of teaching material	3.3	2.9	3.2	3.0	3.0	2.6	2.8	2.5	2.4	2.4	3.0	2.8	2.8	2.8
Design of degree program	3.3	3.4	2.6	3.0	2.9	2.9	2.4	2.7	2.7	2.8	2.8	2.9	2.8	2.9
Testing/grading system	3.3	3.3	2.9	2.9	3.0	2.8	2.5	3.3	2.6	2.6	2.6	2.9	2.9	2.9
Opportunity to choose courses and areas of specialisation	2.9	3.5	2.9	2.7	3.0	2.8	2.5	2.9	3.3	3.2	2.9	3.0	2.7	2.9
Assistance/advice for your final examination	3.0	3.7	3.4	3.4	3.0	2.9	2.6	2.8	2.8	2.7	2.3	2.9	2.4	2.9
Quality of technical equipment (e.g. PC, measuring instruments, etc.)	3.8	3.5	3.2	3.3	3.1	2.7	2.8	2.6	3.0	2.9	3.2	3.1	2.9	3.1
Academic advice offered in general	3.7	3.5	3.2	3.4	3.2	3.3	2.5	3.0	3.4	2.9	2.4	3.1	2.6	3.1
Practical emphasis of teaching and learning	4.0	3.8	3.3	3.5	3.5	2.7	2.6	3.3	3.2	3.0	3.4	3.3	3.1	3.3
Opportunity of out-of-class contacts with teaching staff	3.9	3.3	2.8	4.0	3.7	3.1	3.2	3.4	3.2	3.3	3.8	3.4	3.3	3.4
Chance for students to have an impact on university policies	3.9	3.6	3.9	3.6	3.6	2.9	3.5	3.1	3.0	3.5	3.5	3.5	3.6	3.5
Research emphasis of teaching and learning	3.9	4.2	3.3	3.4	3.6	3.2	3.1	2.9	3.5	3.5	4.0	3.5	3.1	3.5
Provision of work placements and other work experience	4.6	4.2	3.9	3.7	3.3	2.6	3.7	3.4	3.2	3.3	3.9	3.6	3.4	3.6
Chances to participate in research projects	4.1	4.2	3.5	3.7	3.8	3.1	3.5	3.5	3.8	3.9	3.9	3.7	3.7	3.7
<i>Index variables</i> Content and design	2.9	3.1	2.6	2.7	2.8	2.6	2.3	2.7	2.9	2.9	2.8	2.8	2.7	2.7
Quality of teaching and advice	3.2	3.4	3.1	3.2	3.0	3.0	2.5	2.8	3.0	2.8	2.4	2.9	2.8	2.9
Equipment	3.4	3.0	3.1	2.9	2.9	2.6	2.7	2.5	2.6	2.5	3.1	2.8	2.7	2.8
Communication	3.4	3.0	3.0	3.2	3.1	2.7	2.9	2.8	2.7	2.8	3.1	3.0	3.2	3.0
Practical experience	4.3	4.0	3.6	3.6	3.4	2.7	3.1	3.4	3.2	3.2	3.6	3.5	3.3	3.4
Research	4.0	4.2	3.4	3.6	3.7	3.1	3.3	3.2	3.6	3.7	4.0	3.6	3.4	3.6
Count (n)	3071	2997	3026	2291	3491	3049	3429	2661	2624	3307	3079	33025	3408	36434

Question B9: How do you rate the study provision and study conditions you experienced in the course of study that you graduated from in 1994 or 1995? * Scale from 1 = "Very good" to 5 = "Very bad".

4. EDUCATIONAL ENVIRONMENTS IN THE VARIOUS COUNTRIES

As compared to average ratings of the graduates across of the twelve countries, the teaching and learning modes at British institutions of higher education seem to be characterized by an above-average emphasis on free choice and on practical learning. Japanese graduates also observe ample opportunities for choice, and Finnish graduates an emphasis on practical learning. Italian universities are characterized by their graduates as allowing for free choice, but as caring little for practical learning. Norwegian graduates also rated the emphasis on practical learning as relatively low. Finally, programmes in Spain were perceived as offering little choice as well as little practical learning (see Table 1 above).

As regards study provisions and conditions, Table 2 suggests that the Western European countries (the Netherlands and the United Kingdom) and the Nordic countries (Finland, Sweden and Norway) stress practical dimensions above average, such as practical experience, communication and a good equipment. The average ratings by graduates from these countries, however, are not consistently similar. Notably, practical experience was rated most affirmatively with respect to British institutions of higher education, as we already have noted above.

Italy appears clearly seem to have an opposite mode of functioning in those respects. Practical experience (4.3 as compared to 3.4 among all graduates), communication (3.4 as compared to 3.0) and equipment (3.4 as compared to 2.8) are most poorly rated by former students of Italian universities. Again, practical experience is rated as relatively poor for Spanish institutions of higher education.

A second theme cutting across the dimensions addressed in both set of questions (see Table 1 and Table 2) deals with the idea of student freedom in organising his or her studies. This dimension relies on the indices free choice as well as content and design. The institutions of higher education in the United Kingdom are rated according to both dimensions as quite well. Italian universities were rated most positively and Japanese universities as well above average with respect of free choice, as already mentioned, but not above average regarding content and design of the programme.

Finally, the research emphasis within the study provisions and conditions is viewed as strongest by former students from the Netherlands and Finland. There seems to be least emphasis placed on research-linked education in Spain, Italy and the Czech Republic.

Altogether, according to all the 10 dimensions presented at the bottom of Table 1 and 2.2, German institutions of higher education are consistently viewed as close to the average of the twelve countries. In contrast, institutions of higher education in Italy and Spain are viewed most frequently as clearly distinct, both with respect to little practical emphasis and little research-oriented education, but otherwise varying in their difference to the average of the 12 countries.

5. DIFFERENCES OF THE EDUCATIONAL ENVIRONMENT ACCORDING TO TYPE OF DEGREE AND FIELD OF STUDY

As already discussed in the previous chapter, the CHEERS survey did not only include university graduates from long university programmes, but also those from bachelor-level programmes of universities as well as those from 3-4-years programmes of other institutions of higher education. We compared graduates from long university programmes (4 to 6 years) on the one hand to on the other hand graduates from other institutions of higher education, i.e HBO in the Netherlands, Fachhochschulen in Germany and regional colleges or other colleges in Norway as well as as three-year bachelor degree graduates in countries with only a university sector (Spain, France, the United Kingdom and the Czech Republic).

A simple comparison shows that the differences between these the two types of degree programmes are small with regard to most of the dimensions of educational environment surveyed. However, we find some differences concerning practical emphasis and research emphasis. The data almost exclusively confirm differences according to the two dimensions which are viewed as indicative for the two types.

On the one hand, the graduates perceived a stronger research link of teaching at the universities than at other higher education institutions in those countries, where structural differentiation in higher education is based primarily on types of institutions, i.e. in Germany, the Netherlands and Norway. In addition, graduates noted more choice and freedom in the course of study at long programmes in France and Germany.

On the other hand, a relatively strong emphasis on practical learning and experience was reported as well for programmes provided by Fachhochschulen in Germany, HBO in the Netherlands as well as regional and other colleges in Norway. In contrast, a similar difference cannot be found for France and the United Kingdom. In the case of France, the stronger emphasis on practical learning and experience in the long programmes might be explained by the large proportion of graduates of engineering and business schools among those enrolled in long degrees. In the United Kingdom, the a stronger role of practical learning and experiences was

named by graduates enrolled four and more years, because they provided mostly information on post-graduate programmes many of which are specialized and professionally oriented.

Table 3. Emphasis Placed in the Course of Study on Modes of Teaching and Learning as Rated Retrospectively, by Graduates by Field of Study (arithmetic mean)

	Edu.	Hum.	SoSc.	Field Law	f study Nat.	Math.	Eng.	Med.	Total
Independent learning	2.4	2.2	2.5	2.3	2.4	2.4	2.5	2.4	2.4
Theories, concepts or paradigms	2.0	2.1	1.9	1.9	1.9	1.8	2.0	2.0	2.0
Writing a thesis	2.6	2.2	2.4	2.9	2.3	2.4	2.2	2.9	2.4
Facts and instrumental knowledge	2.5	2.7	2.7	2.8	2.4	2.6	2.5	2.2	2.6
Regular class attendance	2.3	2.7	2.9	3.2	2.8	3.0	2.9	2.4	2.8
Teacher as the main source of information and understanding	2.7	2.9	2.9	3.2	2.9	2.9	2.9	2.9	2.9
Freedom to choose courses and areas of specialisation	3.2	2.6	2.7	2.9	2.7	2.8	2.8	3.9	2.9
Attitudes and socio-communicative skills	2.6	3.1	3.1	3.7	3.6	3.6	3.6	2.9	3.2
Project and problem-based learning	3.2	3.4	3.2	3.7	3.3	2.9	3.1	3.3	3.3
Detailed regular assessment of academic progress	3.1	3.3	3.4	3.8	3.4	3.4	3.3	3.2	3.3
Direct acquisition of work experience	3.2	4.1	3.8	4.4	4.1	4.0	3.8	3.0	3.8
Out-of-class communication between students and staff	3.7	3.5	3.7	4.0	3.5	3.6	3.7	3.8	3.7
Count (n)	3690	4630	10685	2805	2410	1421	7178	3460	36280

Question B8: If you look back to your course of study that you graduated from in 1994 or 1995: to what extent were the following modes of teaching and learning emphasised by your institution of higher education and its teachers? Scale from 1 = "To a very high extent" to 5 = "Not at all".

Although programmes in some fields of study are shaped by specific national traditions and conditions, it is worth analyzing the extent to which specific educational environments exist in the various groups of field of study across the countries surveyed. Law obviously is a field which is quite specific across all the countries. Altogether law is lowest in many countries as regards practical emphasis, student freedom to choose, the quality of teaching and the research emphasis (see Table 3 and Table 4). This is quite pronounced in countries as diverse as, for example Italy, Germany or Norway, and it is also true, though to a lesser extent, for Japan. According to the graduates, the educational environment in law is really in a critical state.

Table 4. Quality of Study Provisions and Study Conditions at the Course of Study as Perceived Retrospectively, by Graduates, by Field of Study (arithmetic mean)

	Edu.	Hum.	SoSc.	Field Law	f study Nat.	Math.	Eng.	Med.	Total
Contacts with fellow students	2.0	2.3	2.2	2.3	2.0	2.0	2.0	1.9	2.1
Course content of major	2.5	2.4	2.5	2.6	2.4	2.4	2.5	2.6	2.5
Equipment and stocking of libraries	2.5	2.5	2.6	2.5	2.6	2.6	2.6	2.5	2.6
Variety of courses offered	3.0	2.7	2.6	2.7	2.6	2.6	2.6	2.9	2.7
Supply of teaching material	2.8	2.9	2.9	3.0	2.9	2.7	2.7	2.8	2.8
Teaching quality	2.7	2.6	2.8	2.9	2.7	2.7	2.8	2.8	2.8
Assistance/advice for your final examination	2.8	2.9	2.9	3.3	2.9	2.9	2.7	3.0	2.9
Design of degree program	3.0	2.9	2.8	3.0	2.8	2.8	2.8	2.9	2.9
Testing/grading system	2.9	2.9	2.9	3.2	2.8	2.8	2.8	2.9	2.9
Opportunity to choose courses and areas of specialisation	3.2	2.7	2.8	3.1	2.8	2.9	2.7	3.8	2.9
Academic advice offered in general	3.0	3.1	3.1	3.4	3.0	3.0	2.9	3.2	3.1
Quality of technical equipment (e.g. PC, measuring instruments, etc.)	3.1	3.3	3.1	3.6	2.9	2.7	2.8	3.2	3.1
Practical emphasis of teaching and learning	3.0	3.4	3.4	3.8	3.3	3.3	3.2	2.9	3.3
Opportunity of out-of-class contacts with teaching staff	3.3	3.2	3.4	3.7	3.2	3.1	3.4	3.5	3.4
Chance for students to have an impact on university policies	3.4	3.6	3.5	3.6	3.6	3.5	3.4	3.5	3.5
Research emphasis of teaching and learning	3.6	3.4	3.6	3.9	2.9	3.4	3.4	3.4	3.5
Provision of work placements and other work experience	3.2	4.0	3.6	4.2	3.7	3.6	3.5	3.2	3.6
Count (n)	3685	4622	10686	2798	2407	1417	7165	3463	36243

Question B9: How do you rate the study provision and study conditions you experienced in the course of study that you graduated from in 1994 or 1995? Scale of answers from 1 = "Very good" to 5 = "Very bad".

Medicine stands out, as far as a practical emphasis and a structured curriculum with little choice are concerned. Indeed, medical students have to cover all aspects of medicine initially, are trained for practical application and have only choice with respect to their speciality at a late stage. Thus, the characterization of the educational environment by the graduates is fairly similar in all the countries surveyed.

Engineering is also described as having a practical emphasis. In contrast to medicine, however, graduates have not quite the freedom to choose. This was emphasized by respondents of most countries included in the survey. The only exceptions in the latter respect were France, the United Kingdom and Norway.

Graduates from education perceive their studies as characterised by an importance given to structured teaching at the programme of which they graduated from, whereby teaching is viewed as teacher-oriented and regularity of class attendance has been taken care of. This hold true for most countries, notably Spain, Austria, the Netherlands and Sweden. A strong practical emphasis of education is noted for the United Kingdom and the Netherlands.

According to the graduates' retrospective view, students in humanities are given a large opportunity to design their programme of studies. Free choice is frequently referred to, except for the Czech Republic.

Finally, the natural sciences are similarly characterized in one respect by graduates from all countries. They stand out by a strong research-orientation of education. In contrast, the modes of teaching and learning and the study provisions and conditions seem to be most diverse between countries in the social sciences and in mathematics.

In examining the individual countries, we note that teaching and learning as well the study conditions and

provisions are extraordinarily diverse according to fields in some countries, while the differences, according to the graduates, are much smaller in other countries. Both Sweden and Norway appear quite heterogeneous in this respect, while somewhat of a common culture of higher education can be observed in Spain, Italy, France and Japan.

6. IMPACTS

Educational environments in higher education have grown or are deliberately shaped in order to develop or reinforce certain competencies more strongly than others. Also, some teaching and learning modes as well as study conditions and provisions might be considered as more suitable for the preparation for certain careers than for other careers. The expectation of a link between educational environment with respective competencies and careers is most obvious in the public debate, when some programmes or institutions are viewed as practice-oriented and others as research-oriented. Therefore, we try to examine the extent to which certain dimensions emphasised of the educational environment in the course programmes, as perceived by the graduates, really lead to the development of certain competencies and to extent to which they shape the subsequent careers.

The competencies analysed comprise, as discussed in detail in two chapters below, among others language and computer skills, leadership, skills linked to the management of complex tasks and the responsiveness to unexpected events (concentration, organisation and planning, analytic skills, adaptation, etc.). Also, knowledge skills (theory, general knowledge, etc.) have been addressed as well behavioural and manual skills (loyalty, fitness, etc.). Among the indicators of the graduates' careers, we selected the annual gross income earned by graduates about four years after graduation, i.e. at the moment the survey has been undertaken.

Regressions analyses were undertaken in order to assess the links the educational environment on the one hand and on the other hand the competencies acquired upon graduation as well as the income about four years after graduation. Altogether, 156 regression analyses were needed in order to establish the impact of the various

dimensions of the educational environment experienced by the graduates in their course programme on each dimension of competencies and on the income in each of the twelve countries surveyed. In reporting the most important results, we only refer to findings with a regression coefficient of the standardised variables higher than .10.

The graduates' recollection of the educational environment and their self-rating of the competences acquired upon graduation, first, suggest that a practical emphasis (notably the index "Practical learning") in the course programme supports the development of competencies of leadership and of management skills (e.g. organisation and planning, adaptation and analytic skills). This is the case notably in Spain, France, the Netherlands, the United Kingdom, Sweden and Norway. In addition, we note that an emphasis of the course programme on practical experience is often reported by former students who rated their competencies related to information technology as high. This holds true for Italy, Spain, France, Germany, the Netherlands and Finland.

Second, graduates having noted an emphasis on the quality of teaching tend to rate their general knowledge highly. This holds for the majority of countries (France, Germany, the Netherlands, the United Kingdom, Finland, Sweden, Norway and Japan).

Third, as one might expect, those graduates consider themselves to be highly competent in theories who had been enrolled in course programmes which, according to their recollection, have emphasized theoretical learning. This is the case in all the countries surveyed.

Fourth, we can see that course programmes characterized by communication among students and between students and teachers, are more likely to lead to competencies of adaptation and the ability of cooperating with other people. This link is viewed by most graduates in Italy, Spain, Germany, the Netherlands, the Czech Republic and Japan.

Finally, graduates of some countries who have had substantial free choice in their course of study consider themselves having been highly competent upon graduation with respect to IT competencies, analytic skills and general knowledge. This is predominantly the case in Austria, Germany, the United Kingdom and Sweden.

In three respects we also can identify a link between the learning and environment at higher education institutions and income about four years after graduation. First, those having experienced a strong emphasis on the acquisition of practical experiences have a relatively high income about four years after graduation. It is interesting to note that a closer link can be established between practical experience associated to the courses to income, while, as stated above, competencies upon graduation seem to vary more strongly according to the practical learning at the higher education institutions.

Second, the quality of the course programme seems to be relevant for the careers of graduates. As stated above, the index "content and design" was based on the variety of courses offered, the opportunities of choice and specialisation as well as a good design and a good substance, i.e. on variety, clarity and

demanding level. Graduates who have experienced such an emphasis in the course of study eventually have a relatively high income about four years after graduation notably in Austria, Germany, Finland, Sweden, Norway and the Czech Republic. In addition, a good equipment in higher education is eventually associated with a higher income of graduates in France, the United Kingdom and also the Czech Republic.

Finally, graduates having experienced a strongly research-oriented study programme are likely to earn relatively well in Germany, Sweden, Norway and Japan. In Germany and Norway, this might reflect different career opportunities of graduates from the different types of higher education institutions.

7. CONCLUDING OBSERVATIONS

The majority of graduate surveys focus on the employment dimension, i.e. the formal elements of the world of work: employment status, employment conditions, economic sectors, occupation or position, and income. Also, many graduate surveys only comprise structural information on higher education, e.g. types of programmes and institutions, fields of study or possibly the reputation of an institution. The CHEERS graduate survey is unique in addressing additionally the content dimensions of higher education and the world of work in an internationally comparative large scale survey.

According to retrospective views of the graduates, the higher education environments indeed vary considerably between the various countries surveyed. Italian and Spanish institutions of higher education are often characterized by their graduates as having little concern for practice and as having a low research emphasis in their study provisions. Moreover, the educational environment at Italian universities is criticized as poor in various respects, while graduates only seem to appreciate highly the broad range of choice. Programmes at institutions of higher education in the Nordic countries as well as in the Netherlands and the United Kingdom, in contrast, are viewed as being educationally targeted in various respects of emphasis on practical experience, good equipment and ample opportunities of communication.

The national characteristics of educational environments are reflected in more or less all major fields of study. However, most disciplines are characterized as well by specific educational environment in all or most countries. Medical and engineering programmes tend to be strongly practice-oriented, whereby the former ones leave little room for choice. In contrast, students in humanities enjoy most opportunities of choice. Programmes in education are quite elaborate, as far the processes of teaching and learning are concerned. Teaching in the natural science is most strongly research-oriented. Finally, the educational programmes in law are rated most negatively by their former students in many respects. In contrast, programmes in social sciences and mathematics vary more strongly according to national educational environments.

Moreover, we observe that environments vary substantially according to discipline in some countries, i.e. Sweden and Norway, whereas they have more in common in other countries.

By and large the graduates surveyed perceive a consistency between the educational provisions and the competencies successfully fostered in many respects. An emphasis on communication in teaching and learning is likely to improve the communication skills, a theoretical emphasis of the programme is likely to foster the development of theoretical competences, etc. The study, however, shows that this is not true for all the dimensions of competences and not for all countries surveyed.

As regards the income of graduates, the findings of the study suggest that a research emphasis of the study programme, the provision of practical experience and a demanding, well structured programme with choices is likely to be helpful. In contrast, there are fewer indications that the processes of education and the communication patterns are relevant for the graduates' income about four years after graduation. Again, we have to taken into consideration variations by country and field of study.

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