

INTERNATIONAL PHD STUDENTS IN HUNGARIAN HIGHER EDUCATION INSTITUTIONS

Executive Summary

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INTRODUCTION

More and more doctoral schools are considered a sign of quality in higher education. Increasing the number of participants in doctoral schools is an explicit goal of education policy and a key to enhancing and spreading innovation. In the background there are several motivating factors. On one hand, a larger number of doctoral students can get more staff members involved in postgraduate training at the university. On the other hand, higher education institutions are interested in raising the output of professionals capable of using the latest technologies in innovative ways. It is equally important to train researchers capable of analysing highly complex social and economic problems. Raising the number of PhD students and the quality of their training cannot be avoided if the goal is to improve the position of our universities in the international competition of higher education. The presence and the number of foreign students are the most visible indicators of the internationalisation of any university. Foreign students not only raise the prestige of the institution, but they also bring in revenues for both the university and for the country. From the point of view of quality strategy, equally - if not more - important are staff mobility and the presence of highly esteemed foreign professors. Active participation in international research projects and publication of research results in high ranking journals or acquisition of patent rights also add to the attractiveness of talented and hardworking PhD students. The present structure of the Hungarian higher education system is rather conservative and cannot easily adapt itself to the manifold tasks of doctoral education. At the same time, universities meet international students and homecoming Hungarian students who have had experience with more modern forms and content of doctoral studies and a new approach to postgraduate education.

The aim of the present study is to give a picture of the international aspects of Hungarian doctoral education. An effort was made to learn about the requirements and views of PhD students and to detect and show existing good practices in Hungarian universities. We have studied the relevant literature, university documents, and websites, and researched universities' administrative databases. An online survey was carried out among students and teaching staff to collect empirical information about the different views on doctoral education. To help interpretation of the survey data, interviews were made with 28 staff members of the universities involved in the study.

Research methods

The study focused on the postgraduate level of higher education. Qualitative as well as quantitative methods were used. Qualitative methods included analysis of legal documents and websites, interviews with students and university staff, the study of relevant literature as well as focus group discussions with leaders of enterprises. Quantitative methods included a secondary analysis of available databases and on-line student and teaching staff surveys. Table 1 summarises the methods used. The research was carried out by T-Tudok Zrt. with a contribution of undergraduate, graduate, and postgraduate (*PhD*) students in the second half of 2017.

Table 1 Instruments, databases and methods used in the research

RESEARCH INSTRUMENTS	TARGET GROUP/ TYPE OF DOCUMENT	SIZE OF SAMPLE	BASIC SAMPLE DISTRIBUTIONS
QUANTITATIVE METHODS			
1. Analysis of administrative higher education databases	Higher Education Information system (FIR), Graduate Career Tracking System (DPR), Tempus Public Foundation (TPF) databases	full scale	–
2. Online data collection in October – November, 2017	Leaders/managers, international coordinators and members of the teaching staff in Hungarian higher education	205 people from 32 institutional	45% people in management position 44% members of teaching staff or heads of department 11% international coordinators 21 heads of doctoral schools 7 leaders of doctoral programmes
	Hungarian and foreign students studying in Hungarian higher education institutions	2739 students from 35 institutions	61% foreign students, 37% domestic students, 2% cross-border Hungarian students 13% (354 people) doctoral students, of which 83% foreign citizens
QUALITATIVE METHODS			
3. Document analysis, study of relevant literature	Hungarian and English language websites of universities and their doctoral schools legal and internal regulation documents	Institutions selected by Tempus Public Foundation	
4. Interviews with university staff	Top managers, heads of doctoral schools, international coordinators, heads of doctoral schools, members of members of teaching staff	28 persons (of whom 11 heads of doctoral schools or vice-deans)	Corvinus University of Budapest, Budapest University of Technology and Economics, Budapest Eötvös Loránd University, Óbuda University, University of Pécs, University of Szeged, Central European University
	Hungarian and foreign doctoral students in Hungarian higher education	34 persons (15 foreign students, 19 Hungarian students)	Corvinus University of Budapest, Budapest University of Technology and Economics, Budapest Eötvös Loránd University, Óbuda University, University of Sopron, Moholy-Nagy University of Art and Design, University of Pécs, University of Szeged, University of Debrecen, and Pázmány Péter Catholic University
5. Focus group meetings, personal interviews and interviews by telephone	Representatives of firms and research institutes	Two focus group meetings, 8 interviews	Hungarian Academy of Sciences MTA Centre for Social Sciences, Eötvös Loránd University, Corvinus University, Hétfá Research Institute, Budapest Institute, Telecom and partners Bay Zoltán Nonprofit Ltd. for Applied Research, Graphisoft, Richter Gedeon, Ericsson, Vodafone Man-hunting firms: Beck and Partners, Aarenson, VPS Group Kft., Tesk, Randstad

Internationalisation of Hungarian doctoral education in an international context

Comparative educational statistics show that there is a strong relationship between the R&D investments of a country and the ratio of foreign PhD students. The analysis of student mobility data shows that, unlike in other countries, inward mobility is intensive at the master's level while it is much less frequent at the doctoral level. This might be due to the fact that the R&D budget is very low in higher education, less than half of the EU average. Furthermore, the relatively low expenditure shows a specific pattern in Hungary, similar to that in post-socialist countries such as Slovakia, the Czech Republic, Russia, or even China. In these countries, basic research is mostly financed from government resources while wealthy universities with greater autonomy in other countries are able to invest in basic research from their own resources to a much larger extent. The low rate of R&D and total dependence on government support explains why the business sector has become the primary agent of brain drain and a more successful competitor for R&D government support than the universities. This phenomenon – though present all over the world – seems to affect Hungarian universities rather more than universities in many other countries.

The number of doctoral students nearly doubled between 2006 and 2016. While in the autumn semester of 2006 there were 719 foreign doctoral students enrolled in Hungarian universities, there were 1351 enrolled in 2016. In the same period, however, the number of Hungarian students decreased by over a thousand. Thus, the ratio of foreign students in postgraduate education grew to 18 per cent, which is nearly twice as high as the share of international students within the total of the higher education population. This indicator suggests that doctoral schools have made more progress with respect to internationalisation than Hungarian higher education as a whole.

Table 2 Ratio of university students and doctoral students with foreign citizenship to the total number of students and doctoral students respectively

HIGHER EDUCATION TOGETHER				
Academic year	Total number of students	Number of Hungarian citizens	Number of foreign citizens	Ratio of students with foreign citizenship
2006/07. autumn semester	416 348	400 292	16 056	4%
2011/12. autumn semester	359 824	337 928	21 896	6%
2016/17. autumn semester	287 018	259 547	27 471	10%
DOCTORAL STUDENTS				
Academic year	Total number of doctoral students	Number of Hungarian citizens	Number of foreign citizens	Ratio of students with foreign citizenship
2006/07. autumn semester	7784	7065	719	9%
2011/12. autumn semester	7254	6449	805	11%
2016/17. autumn semester	7358	6007	1351	18%
DOCTORAL STUDENTS WITH FOREIGN CITIZENSHIP				
Academic year	Number of students without a Hungarian background	Number of students with a Hungarian background	Ratio of all foreign students to the total number of doctoral students	Ratio of crossborder Hungarian students to the number of doctoral students with foreign citizenship
2006/07. autumn semester	48	671	7%	93%
2011/12. autumn semester	98	707	12%	88%
2016/17. autumn semester	471	880	35%	65%

Source: FIR (Higher education information system) database, ad hoc query; Central Statistical Office, Dissemination database: Students, graduates in higher education

While the number of students with foreign citizenship, but with a Hungarian background, increased by a little more than 31 per cent between 2006 and 2016, the number of foreign students without a Hungarian background became 10 times larger during the same period. Whereas cross-border Hungarian students constituted 93 per cent of all doctoral students with a foreign citizenship in 2006, their share dropped to about two third of all PhD students.

Most doctoral students come from developing countries. 9 students out of 10 are from one of these groups of countries. Most students come from India (39), followed by students from Turkey (33 students) and Iraq (30 students).

Eötvös Loránd University has the most populous group of international students (217 people). Universities with more than a 100 foreign doctoral students are the University of Pécs, the University of Szeged and the University of Debrecen. Two sharply different models emerge from the data: smaller institutions in country towns can almost exclusively recruit students with a foreign background (*University of Kaposvár, University of Sopron*), while at the other end of the scale, there are the doctoral schools in Budapest offering elite programmes in foreign languages such as the Central European University (*English*), and Andrassy University Budapest (*German*). The international students of these universities do not typically have any Hungarian background. Hungarian universities with great tradition and a large student population (*for example the University of Szeged and Corvinus University*) are between these two extremes.

At the same time there are also differences between large Hungarian universities too. In the autumn semester of 2016 the most international students with no Hungarian background were enrolled in the University of Szeged (88 people, or 47 per cent of all doctoral students), while by far the most students with a Hungarian background were enrolled in Eötvös Loránd university (157 people or 72 per cent of their doctoral students).

Looking at the ratios of doctoral students by faculty, we find that their ratio ranges from 9,7 to 29,1 per cent. The highest ratio was found at the Faculty of Science and Informatics of the University of Szeged, whereas among the largest faculties, the lowest ratio was found at the Eötvös Loránd University.

While about one third of PhD students with a Hungarian background are state financed, without such background the ratio is below 3 per cent. In both target groups, the majority of doctoral students study on a defrayal or self-finance basis, but the proportions are significantly different. In the case of foreign students, the dominant financing form is the Stipendium Hungaricum scholarship or a defrayal basis (*paying the direct costs of study*), whereas students with a Hungarian background often study on grants from the relevant ministries or enjoy other forms of state support as well. The number of foreign PhD students studying on an Erasmus+ grant is marginal.

The growth rate of doctoral studies is remarkable in the field of social sciences both amongst foreign students and cross-border Hungarian students. While the strongest field was humanities in 2006 with a share of 42 per cent participation, this dropped to 23 per cent by 2016. From 2011, social science took over in popularity and, apart from a few fall-backs in the 10-year period studied, by 2016 it reached 31 per cent among students with no Hungarian background. Science and technology also had a significant share in the study fields of doctoral students.

In the case of students with a Hungarian background, the distribution by field of study is basically similar to that of domestic students. However, medicine and health sciences as well as agriculture had a greater share than in the case of domestic students. Science and technology, on the other hand, were less popular study fields for cross-border Hungarian students than for domestic students.

Percentages of foreign students and cross-border Hungarian students by field of study in 2016/2017 (N=471 and 880)



Figure 1 Percentages of doctoral students by field of study 2016/2017

While 99 per cent of cross-border Hungarian students with foreign citizenship took their courses in Hungarian, most other foreign citizens took English (94 per cent) or German courses (6 per cent). It is worth noticing, however, that the ratio of foreign language dissertations written by students with a Hungarian name grew in the past few years from 14 to 22 per cent, whereas the ratio of graduates with foreign citizenship did not really change (3 to 4 per cent).

Analysing the foreign language dissertations by branches of science written by students with a Hungarian name, we find that a larger ratio of foreign language dissertations are written in natural sciences, engineering or medicine and health than in the humanities, arts, agriculture, social sciences or religion and theology. However, a trend of growth can only be observed in social sciences.

Our analysis of each university showed that the ratio of foreign language dissertations by students with a Hungarian name was generally higher at the University of Szeged and the Budapest University of Technology and Economics than at Eötvös Loránd University or the Universities of Debrecen and Pécs. Moreover, the growth trends are more dynamic as well: 40 per cent at Szeged University and 27 per cent at the Budapest University of Technology and Economics between 2012 and 2016.

Compared to other universities, the University of Szeged has the highest ratio of foreign PhD students among all graduates (5 per cent) and also shows dynamic growth. At the University of Technology and Economics, only 1 per cent of PhD graduates have foreign citizenship and this ratio has not changed in the past years. The ratio of PhD graduates varies from year to year at the Universities of Pécs and Debrecen and the trend is negative in the case of Eötvös Loránd University.

Ratio of foreign language dissertations among all dissertations written by international PhD students with a Hungarian name by branch of science

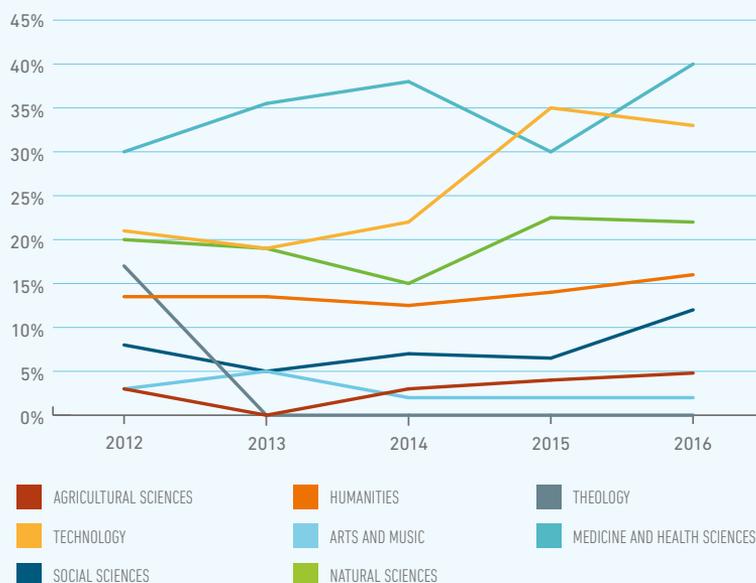


Figure 2 Ratio of foreign language dissertations among all dissertations written by international PhD students with a Hungarian name by branch of science (www.doktori.hu)

The Erasmus+ programme

The Erasmus+ programme offers grants for postgraduate studies not only for students but also for higher education staff members. The University of Szeged was the most attractive target institution in 2015, enrolling more than 10 per cent of the mobile higher education staff members, most of them from Romania.

79 Hungarian doctoral students participated in the Erasmus+ programme abroad at the ISCED 8 level in 2015, significantly fewer than the number of foreign students coming to Hungary during the same period. For Hungarian doctoral students, Germany was the most popular target country. The duration of their studies is unknown, which limits the possibilities of interpretation. Since there are several thousand international students in Hungarian doctoral programmes, the total of 129 doctoral students from Hungary studying abroad (*whether as Erasmus students or other*) appears to be a rather low rate.



The internationalization of doctoral schools

While the administrative databases of universities show a permanent growth in the number of international PhD students, the university homepages and the results of our online surveys and interviews with doctoral students and staff suggest that an explicit strategy towards real internationalisation is missing at most universities. It seems that, in most doctoral schools, activities related to internationalisation are confined to the individual activities of mobile students and staff members.

Homepages of doctoral schools and their content

Of the 160 doctoral schools we studied, 110 have websites in a foreign language (*live or static*), which means that in at least 50 of them no update information is available for foreign students on the activities of the doctoral school. Of the doctoral schools with no homepage of their own, quite a few belong to big universities and have a fairly large number of international students.

Dozens of existing homepages of doctoral schools are actually useless for foreign students. Some of them do not have an English (*or other foreign language*) version but the relevant documents are published only in Hungarian. Some of them are not alive or nearly empty or under development, others simply send the reader to the homepage of the National Doctoral Council (*OTD*) or have no links or the links do not work.

Another typical case is that a doctoral school has no homepage of its own but the English version of the University/Faculty homepage contains information about the doctoral programme. Even where there is a foreign language version of the doctoral school's homepage, this version is rather scanty and less structured than the Hungarian version. In many cases, only ad hoc information is available, there is hardly any sign of conscious targeting of information to the types of desired applicants.

On the doctoral school homepages of some information value, one can almost always find documents or links to pages where the relevant documents (*e.g. the doctoral regulations or the quality assurance document of the university*) can be found. Often, the doctoral programme is published and, in quite a number of cases, the doctoral school publishes its self-evaluation document. However, we found only ten homepages where foreign language documents were published. Even in the English version of the National Doctoral Council (*OTD*) homepage, the documents are published only in Hungarian. Doctoral regulations in English can only be found on the homepage of three universities.

Goals of internationalisation at the level of the institution

Activities indicating internationalisation

On the whole, doctoral schools' have the same kind of international activities as the other parts of the university. In certain areas, however, they work more actively for internationalization than, for example, their colleagues engaged in undergraduate or graduate education. Such areas are, amongst others, the internationalisation of content, search for research partners abroad, support of student mobility, etc. Yet, doctoral schools are none the less backward with regard to the internationalisation of the academic staff or transnational education. Interestingly, international education in a virtual space, employing international professors or activities like those of a student or teacher ambassadors are not amongst their set of tools of internationalisation.

On the other hand, doctoral schools are ahead of undergraduate and graduate education in internationalisation of the learning environment within the institution. They use foreign literature much more, they build on the knowledge and experiences of their foreign students more often than their colleagues teaching undergraduate and graduate courses. They are also a lot more dissatisfied with the traditional content of teaching and the lack of international approach in content development than the rest of the academic staff. Their approach reflects awareness of international trends in postgraduate education and they are more sensitive to education quality and the effective use of internal capacities.

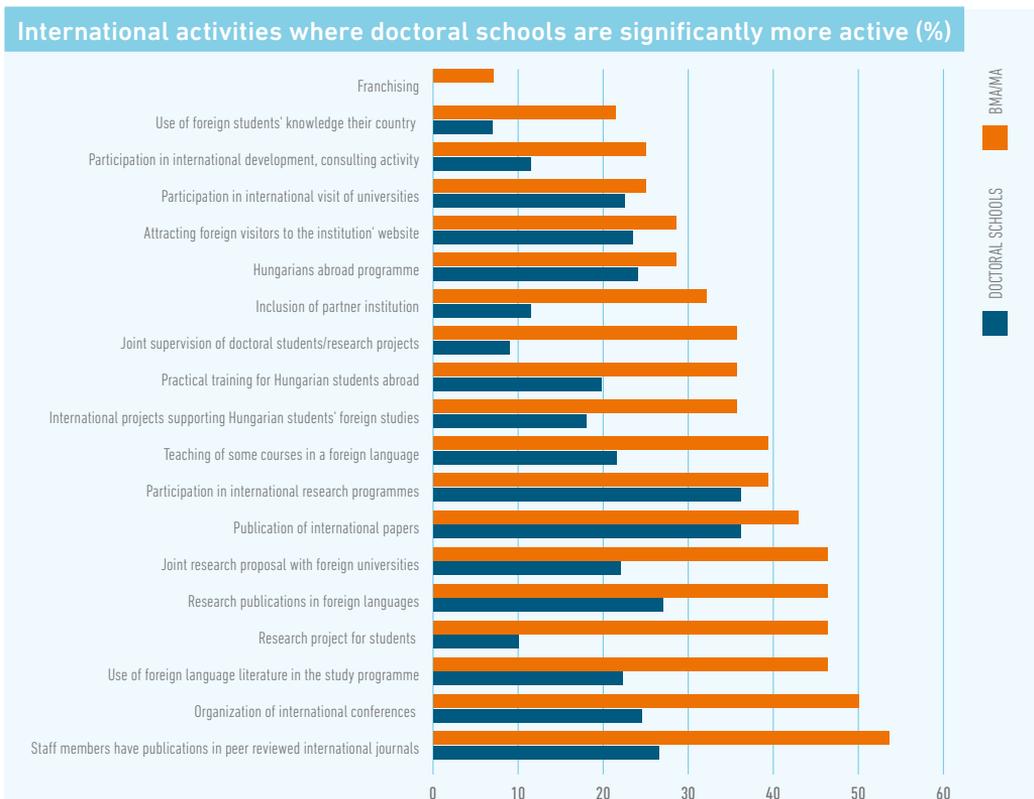


Figure 3 International activities at the doctoral level and at the undergraduate and graduate level

Research activities depend on individual initiatives in most of the universities and, therefore, they have no strong institutional background in higher education. Following government priorities, most resources are concentrated on student mobility. Since this approach puts more workload on the academic staff, research and development are pushed into the background of university activities and is left to be organised along individual ambitions and personal connections and networks. To make it worse, government expenditure on research and development remains low and an increasing proportion of it is transferred to the private sector. Research projects are mostly attached to departments rather than to doctoral schools. Thus, the doctoral school has a kind of floating status within the organisation of the university. What is more, the research projects are often carried out by a research group attached to the Hungarian Academy of Sciences. The members of the research group typically do not participate in teaching but have a research post within the university. Departments with a known research tradition are usually more successful in raising research funds and attracting students of excellence.

Regarding student mobility, Hungarian students who study abroad typically are typically self-financing or study on special grants like a foreign or international scholarship. There are no mobility programmes attached to doctoral schools. However, doctoral schools support participation in international conferences and they do not make distinction between Hungarian and international students in this respect. Within their tight budget, doctoral schools try to ensure that each doctoral student participate in one major European conference. They make substantial efforts to find the means for supporting international publications but there are very limited resources available for this purpose.

The most important goals of internationalization

Staff members were asked about the goals of internationalisation at two levels: at the level of the higher education institution as a whole, and at the level of their institute (*faculty, department or doctoral school*).

Managers and the academic staff were questioned about the most important strategic goals of internationalization in their higher education institution as a whole. Mobility appeared to be among the most important strategic goals for 38 per cent of the 205 respondents. The second most popular answer was participation in common projects, international conferences and research (*26 per cent*). International visibility, improvement of academic quality, and broadening the offer of foreign language programmes were the third and fourth most frequent answers (*mentioned by 15 and 13 per cent of the respondents*). The views of those who are engaged in doctoral programmes significantly differed in one thing from those who are not: namely that they rarely mentioned mobility as a goal of internationalisation. This difference was confirmed by the analysis of the responses to questions asked about the importance of different possible internationalisation goals as well as by the interviews with academic staff members.

Mobility goals were most frequently emphasised by top and middle managers and international coordinators. The importance of university revenues and the prestige of the institution were stressed most markedly by members of the academic staff. Middle managers appear to have the most balanced approach to internationalisation: beside the goals mentioned above, they also stressed the importance of access to international publications and conferences. Interestingly, heads of doctoral schools and programmes viewed these goals somewhat differently. Although the number of respondents from this circle limits the possibilities of interpretation, the data confirmed their commitment to quality improvement, research, and programme offer as prerequisites to the mobility of doctoral students. They appeared to be less interested in pursuing mobility growth at the undergraduate or graduate level.

Views on the strategic goals of internationalisation
(N=146, of which 18 heads of doctoral school or programme)

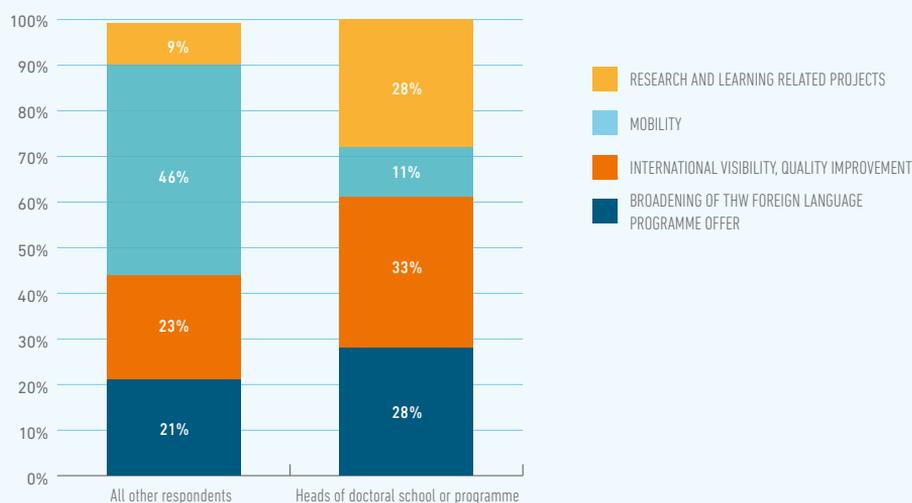


Figure 4 Percentages of staff views on the most important institutional goals of the internationalization strategy (N=146, of which 18 heads of doctoral school or programme)

In answer to the question whether their institution (*faculty, department or doctoral school*) has an internationalisation strategy, 68 per cent of staff members of doctoral schools reported that they had one, whereas this percentage was 55 per cent (*not a statistically significant difference*) among respondents who were not involved in doctoral education. Regarding the responsibility for their internationalisation strategy, 38 per cent mentioned the head of the doctoral school, but an equal proportion of the respondents meant that there was no designated person for the strategy in their doctoral school. The dean or the director of international affairs were mentioned by each respondent as the person responsible for the internationalisation strategy. The responses suggest that doctoral school staff interpret internationalisation primarily at the school's level where collective responsibility is often substituted by individual responsibilities for internationalisation. On the other hand, 43 per cent of the staff members of doctoral schools reported that the school had an internationally accredited doctoral programme, which term was used as a main signal for internationalisation.

The level of internationalisation is not monitored in doctoral schools separately. However, members of the academic staff participate in the governing bodies of the university and, through them, receive feedback on the process. Besides this, questions on internationalisation appear in the guidelines for self-evaluation, thus the doctoral school is supposed to provide information about this area of activity as well.

Changes in the organization structure supporting internationalization in doctoral schools

Unlike departments, the doctoral schools are not separate entities within the university structure. One of the weaknesses of Hungarian doctoral schools is that they are not sufficiently active in supporting their students' mobility. Students must find a place to study for themselves if they want to go abroad. Spending some study time abroad is not formulated as a goal in the doctoral programme (*except in one doctoral school of Eötvös Loránd University which offers the programme of the European Doctorate of Teacher Education, EDITE*).

Updating the official website of the doctoral school is the job of a central unit in the organisation structure. Information about the available study programmes for foreign students and access to them is the task of the international office of the university. This unit is responsible for the coordination of the work of service units engaged in information and consulting services provided for incoming foreign students, and in practical matters related to studying at the given university.

Doctoral schools are typically small and no formal rules or events are needed for sharing international experiences. Our respondents generally agree that good practices their colleagues have seen abroad are much talked about even if no special events are organised for sharing their knowledge about them. Publications prove that sufficient information is shared that way among members of the academic staff and their students.

With the arrival of a growing number of foreign students, universities learn how these new international contacts can be best used for the advantage of all those concerned. Promising institutional processes have emerged in this area. Thanks to scholarship programmes such as the Erasmus, Erasmus+ grants or the Stipendium Hungaricum and the Horizon 2020 scholarships, nowadays universities receive a larger number of students from abroad. These programmes were started as projects and the project management had the task to give efficient study information and support to mobile students. Their competence was integrated into the institutional structure when the project was closed and providing support and information to mobile students became a permanent task for the university. The same learning process can be observed at the level of doctoral schools as well. The work groups dealing with doctoral students in the project phase have become competent in dealing with tasks related to internationalisation when it became a general job requirement. The process sped up internationalisation, and staff members who did not have the experience of the initial projects became active participants in the activities leading to internationalisation of the doctoral school.

Limits to internationalization

Evidence of the online survey shows that the views of heads and programme leaders of doctoral schools are similar to the views of the academic staff and the department managers in many ways. Top leaders and managers of the universities rate insufficient foreign language competence and structural problems as some of the largest obstacles to internationalisation. On the other hand, these obstacles are less stressed by heads and programme leaders of doctoral schools than by staff members working at lower levels of higher education. The latter two groups believe that the overwhelming workload, organisational culture (*or the lack of it*), and bureaucracy are much greater problems than thought by the top management and international coordinators. In one area, however, all three groups agree, that insufficient financing is a most serious obstacle to broadening the scope of internationalisation.

While language and communication are less vital problems in doctoral schools or elsewhere in the university, insufficient language skills of foreign students entering the doctoral school, lack of foreign

language skills on the part of the university administration, and, finally, the insufficient foreign language competence of some Hungarian students may cause problems in doctoral schools as well. In the case of Hungarian students, the problem is not simply deficient foreign language skills but also a lack of communication where the student refrains from asking questions or making comments. International networking of doctoral schools or entering into joint programmes are further hindered by the fact that the doctoral regulations and requirements are quite different in the American, the European, and the East-European systems. At the same time, there are views that organisational culture, unresponsive management, and a fear of competition might also be barriers to a more intensive internationalisation process. The instability of the doctoral school as an organizational unit, diverging individual interests, low position in the university hierarchy, unfair competition between departments, doctoral schools and other organization units all contribute to the inertia making Hungarian higher education powerless in the swiftly changing global higher education area.

All those concerned agree that first class internationalisation depends on how universities are able to attract well reputed professors from abroad. However, universities have very limited means to do this these days. Our respondents are of the view that bureaucratized regulations are the main obstacle and they believe that those who make the regulations and have the executive power to enforce them act along values which are very far from the university's academic values. Respondents mentioned the difficulties of mobility on the part of Hungarian staff members as well. The stretch of the teaching load and workload in general do not leave room for substituting a colleague on study leave or international work. Employing a substitute or creating a new post is usually impossible.

Many doctoral schools have capacity problems that make them unable to participate in international research projects or apply for grants. Although some of the staff members may have connections with foreign doctoral schools, Hungarian doctoral schools typically do not have formal contacts or partnerships with other doctoral schools. They have limited possibilities in enrolling students due to the scarce number of state financed places.

Internationalisation at the premium level requires international reputation of excellence in scientific and research activities. In light of this fact, the instruction-centred approach and the enforced mobility approach are counterproductive in many ways. Doctoral schools are motivated to teach subjects instead of building a substantial part of the instruction on research activity.

Factors limiting the possibilities of internationalization according to managers and coordinators, heads of doctoral schools and the teaching staff (%mentions)

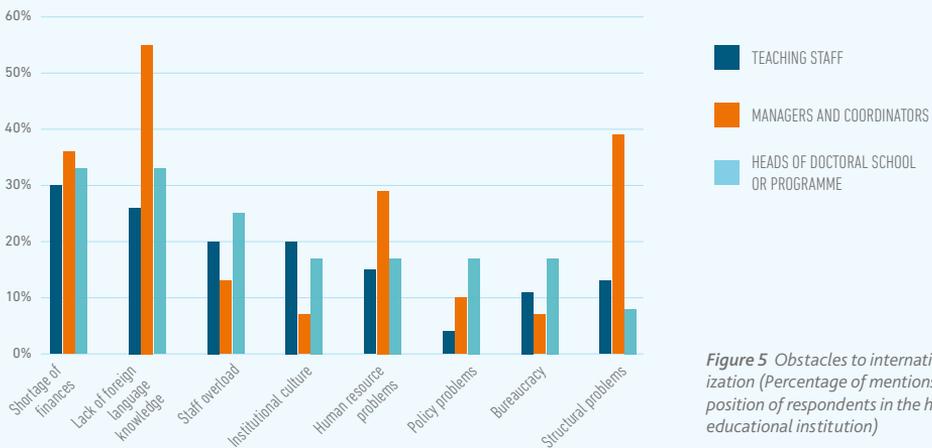


Figure 5 Obstacles to internationalization (Percentage of mentions by position of respondents in the higher educational institution)



Analysis of the doctoral process

The aim of the analysis was to give an overall picture of the doctoral process and detect the essential problems related to research activities. The analysis is structured around the phases of the doctoral process. Six phases of the doctoral cycle were identified: recruitment and application, entry and administration, doctoral studies, the complex examination, research and the thesis, and the final doctoral examination and graduation. In the analysis, we use the results of the homepage analysis and document analysis, the data collected from staff members and doctoral students as well as the interviews with staff members, students, and business and research representatives.

Recruitment and application

Hungarian doctoral schools are obviously open to internationalisation: of the 169 doctoral school starting doctoral training, 158 (93,5 per cent) have a foreign language programme.

Recruitment of foreign students must start with raising interest and demand for studying in Hungary and specifically at the doctoral school in question. Various media serve this purpose, including the studyinhungary.hu homepage, international education fairs, homepages of the institutions, etc. In the case of web information, not only higher education studies are promoted. Along with higher education institutions, Hungary as a country, the complex services of the university and the town as well as possibilities for leisure activities are advertised.

Information about the mode of application belongs to the introductory phase as well. For this purpose, the most important webpages are felvi.hu, and studyinhungary.hu.

On the homepages of doctoral schools, the “0” phase is mainly represented by information about how to apply and what admission criteria are there to be reckoned with. This, and regulations on the doctoral process are usually given in a clear and correct manner. Messages advertising the doctoral school itself were rarely found in our website analysis. However, we found hardly anything that raises the interest of those who surf the web for information about which particular doctoral school is worth choosing.

The online questionnaire asked students how they had acquired knowledge about the doctoral training they had chosen. The answers showed that the internet was the medium they typically used, the second most frequently mentioned source of information was the university itself, and the third most frequent source of information was communication of fellow students. Since students mainly use the internet for preliminary information, the university homepage plays a strategic role in recruitment. It is

highly important that the university homepages for foreign students are informative and up-to-date. Relevant and adequately detailed information about the doctoral school is a crucial determinant in students' choice.

Although the number of foreign students is growing – thanks to the Stipendium Hungaricum programme – the ratio of foreign students in Hungarian doctoral schools is not very high. Evidence of the online questionnaire for staff members suggests that the doctoral school as an institution is not very engaged in recruitment or in any other services to students that is not part of their studies. The interviews confirm that services to students other than what strictly belongs to their studies are not typical in doctoral schools. Apart from some good practices, the philosophy seems to be that doctoral students are adults who are able to care for themselves. Most of the personal contact doctoral students have is with their supervisors who help them in selecting the theme of the thesis, and can be consulted with respect to research, selection of literature and writing the thesis.

In the case of doctoral schools, less interest for recruiting foreign students might be related to quality problems. It seems that Hungarian higher education was successful in increasing the total number of foreign students, but these students enter primarily undergraduate or graduate courses. Selection at this level is confined to distinguishing between students who are able to start university courses immediately and those who must participate in preparatory courses. Doctoral schools cannot really afford this. Almost all interviewees experienced that students holding a Stipendium Hungaricum scholarship are unprepared for doctoral studies, even those who have obtained a master's degree in a Hungarian higher education institution. On the other hand, those who are well prepared do not stay in Hungary because they find the financial support offered to them insufficient.

Enrolment, administration

Once a student gains admission to a doctoral course, there are administrative matters to be arranged within a relatively short time. Hungarian students also have problems with this and, for foreign students, this second phase of the doctoral process is critical. Quite often they have to arrange administrative matters from their home country. Of the official websites, the English version of felvi.hu only deals with the entry administration and legal duties of the incoming foreign student superficially. The website studyinhungary.hu provides contacts for consultation and also a list of frequently asked questions with answers. Most university homepages publish abundant information regarding application and admission, but only a couple of them contain information regarding deadlines, selection of courses, etc. In one case, the university gives this information through software which can be used. In an extreme case the information leaflet designed for foreign students is available only in Hungarian! Besides information about the course, leaflets for foreign students sometimes give reference to living costs, residence and other practical matters.

Yet, survey results suggest that international students are, on the whole, satisfied with the administrative part of the entry process. On average, contacting the university, and the information about the admission procedure was judged as good (4 on a scale of 1 to 5). Students were somewhat less satisfied with the information given to them by the university on how to prepare for the studies/courses and for life in Hungary. As we learned from our investigation, foreign students who have no connections here may receive support from mentors. The mentor's task is to help the student find orientation among the sources and various pieces of information, they are helped in course selection, in arranging administrative matters such as immigration, and in discovering the city or town of the university.

Doctoral studies

Doctoral studies constitute the first, longer phase of doctoral training. Information about this phase is available on most homepages but there are differences in the degree of detail. Several schools mention that credits obtained outside the doctoral schools (*e.g. on summer courses and studies in another doctoral school*) are acceptable on certain conditions. Only a few schools mention the conditions of participating in courses and this is also true of the possibilities of individual preparation for doctoral work and graduation. Evidence of the student survey shows that about 27 per cent of the respondents think that their university lives up to their expectations, while 13 per cent say they had expected more. Students are most satisfied with university infrastructure and they are least satisfied with the university's leisure time offer. Hungarian and international students agree on the quality of instruction and the environment, however, Hungarian students are more positive about the variety of leisure activities and the quality of social contacts and networking.

The interviews suggest that international doctoral students are generally satisfied with the erudition of the professors but they are less satisfied with their competence in English. Hungarian doctoral students with an experience of foreign universities report that the standards of doctoral training are higher in western universities, especially concerning instruction methods.

Regarding social contacts, survey data suggests that only about one fifth of international students spend time with Hungarian students. Those who do so say they meet Hungarian students in courses, events related to studies or sports and parties organised by the university. Hungarian students were more positive about the openness of foreign students than vice versa. Most universities help foreign students socialise within the framework of the mentor programme, which includes the organisation of parties and other leisure time programmes. Most other events like performances, presentations, lectures are in Hungarian and there is no effort made by departments to change this. Both Hungarian and international students think language barrier is one of the main obstacles in making acquaintances.

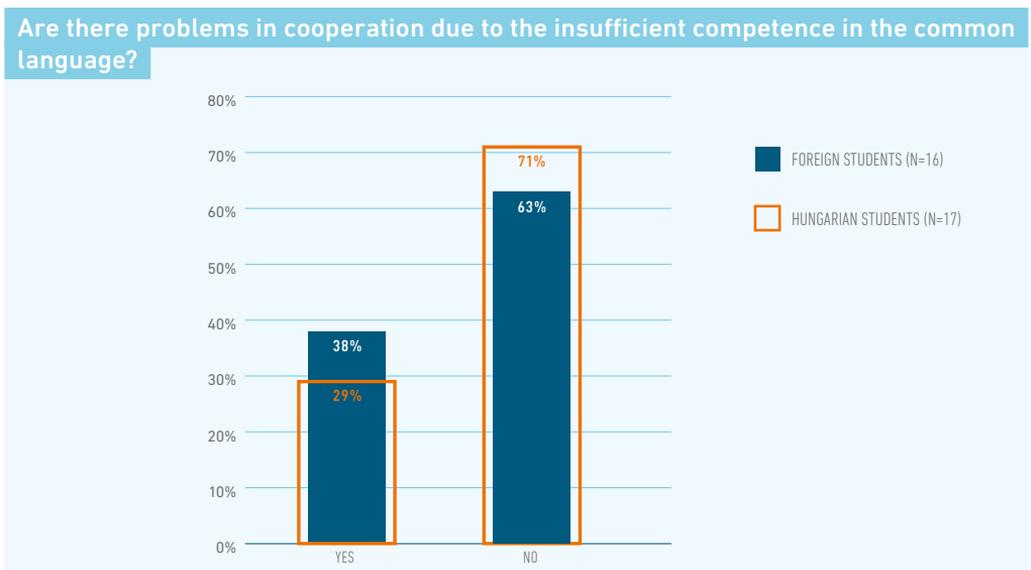


Figure 6 Awareness of the problem of insufficient common language competence among Hungarian and foreign students

Research, PhD thesis

The second, longer phase of the doctoral process is doctoral work including research and preparing the thesis. The requirements of doctoral work are published on the homepages of doctoral schools although not in the same detail. Some of the homepages give detailed descriptions of the publications required of the candidate, others just touch upon this topic or do not mention publication requirements at all. Research is emphasised as the most important element required in the doctoral process; much of the content related to research bears international relevance and research is present in the doctoral regulations of the school. Quality Assurance Programmes formulate objectives related to encouragement and support of gaining international experience (*e.g. participation in conferences, study tours, credit mobility*). Requirements are made explicit in the QAPs regarding the enforcement of professional control of the Hungarian and international scientific community, and about international publication standards. Following up on the scientific achievement of doctoral schools active in the same or in a similar field of research is meant to be standard requirement of research activities according to most doctoral regulations and QAPs.

One of the important objectives of our study was to find out how much doctoral schools help students to get involved in the international network of professionals in their field of research either by participating in common programmes or by making acquaintances among them. Survey evidence shows that domestic and international students see the situation in a similar way. Both groups are aware of the efforts of their supervisors and the doctoral school but they thought that they would need more support. Both groups were generally satisfied with the research conditions, they marked them as good (4 on a scale of 1 to 5).

International students perceived communication difficulties and poor research infrastructure as the greatest hindering factor in their research. Support in publishing results and help with getting to international conferences were more positively taken by Hungarian students than by international students but they agreed that the efforts were insufficient in the latter (an average 2 on a scale of 5).

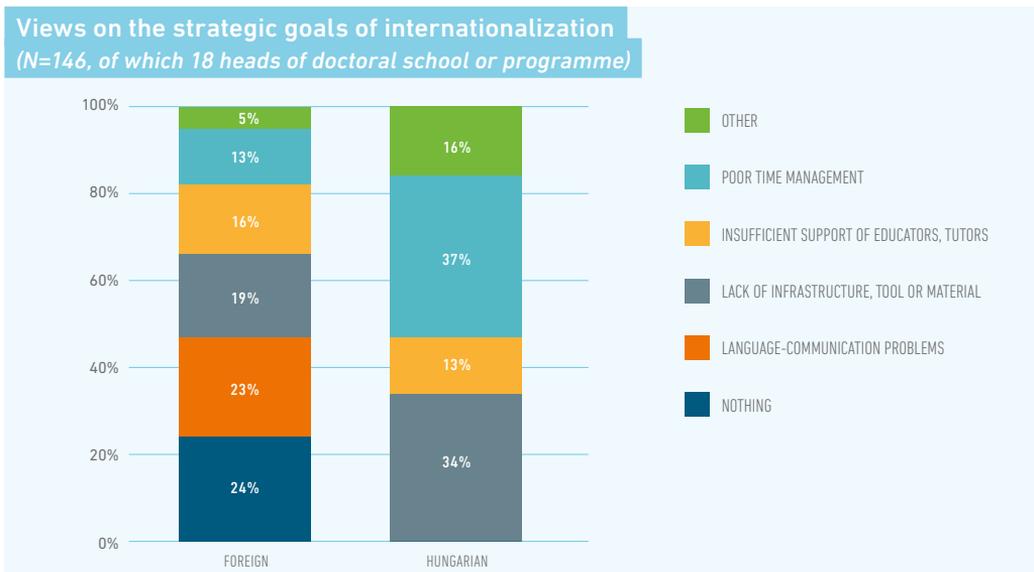


Figure 7 Awareness of problems related to PhD students' research activity (%)

The online survey for university staff members contained questions about the involvement of PhD students in international research. Respondents of the academic staff of doctoral schools say that candidates have the possibility to obtain research credits from international research. All of them report that they involve PhD students in international research programmes at least to some extent, but only 38 per cent report that they fully involve students in international research programmes. At the same time, only one fourth of respondents report that they involve PhD students in the international professional community. About 50 per cent of the respondents believe that poor research infrastructure is the main hindering factor for domestic students in their PhD research, 27 per cent think that instructors and supervisors do not give sufficient support and 23 per cent mention the lack of opportunities. The problems are similar in the case of foreign students further enhanced by language and communication difficulties. Several of the interviewed staff members mentioned that many students holding a Stipendium Hungaricum scholarship come with defective English competence. Domestic students must have varied experiences concerning access to international conferences. Half of the staff members of doctoral schools report that their students are given full support in getting to international conferences, the other half say they do not. Similarly, 19 per cent of foreign students get no support, 31 per cent are given some support, and 50 per cent are given full support in getting to international conferences. PhD students are rather more involved in international research programmes than in international professional communities. 75 per cent report that doctoral schools support publication.

Analyses of homepages suggest that universities' homepages do not contain sufficient information for future applicants regarding choices of themes and supervisors. For this reason, students often choose their supervisor only after entering the doctoral course. Chances for getting involved in international research programmes depend mainly on the connections of the supervisor, or on the intensity of interaction between the supervisor and the doctoral student. As we see from the interviews with Hungarian doctoral students who have international experience, the universities they attended were typically much more research oriented than Hungarian universities, which have neither enough time nor enough energy for research activities.

Complex examination / doctoral examination

Complex examinations, end of semester work plans and annual research reports are mentioned as requirements only in half of the English homepages of doctoral schools.

Recent changes in the doctoral regulations dividing the doctoral procedure into two, four semester phases favour the admission of more foreign students, our interviewees say. Since the first phase is concluded by the complex examination, there is an output of doctoral schools without losing their good repute.



Graduation

Graduation from doctoral studies is the most important concluding phase of the doctoral cycle.

The analyses of doctoral regulations and legal documents on higher education show that a relevant progress has been made toward the internationalisation of doctoral training, since the most important requirements of accreditation and doctoral regulations are codified in law and government decrees. Unfortunately, the English language homepages vary in detail just as much as they do concerning the other phases of the doctoral process. Even some of the major doctoral schools fail to give details of the graduation process on their English homepage. Most of the homepages, however, mention this last phase of the doctoral process at least in general terms. Graduation requirements and processes are made explicit in the doctoral regulations and the bylaws of doctoral schools. Contents relevant from the point of view of internationalisation include the student's right to choose the language of the thesis, and the right to have it reviewed in the same language, the requirements to have a bilingual thesis summary, and foreign language proficiency examination certificates. Difference from other European doctoral regulations makes it necessary for doctoral schools to double the thesis defence if they have a shared doctoral programme with a foreign doctoral school. That is to say that two thesis defence events have to be organised: one according to Hungarian regulations and the other according to the other country's regulations. The supervisor usually has a vote in the foreign jury but has none according to the Hungarian regulations.



Doctoral training and the labour market

Labour market output from the students' point of view

Within the framework of the internationalisation of higher education studies, we followed up on the labour market career of doctoral students who had passed the final doctoral examination. Apart from the data needed in the institution's administration, universities do not keep or collect systematic information about their students after they have left the institution. As a consequence, their homepages rarely contain information about the labour market outcomes of their doctoral courses. We have analysed the data of the postgraduate career tracking system (*DPR*) on students graduating in Hungarian higher education institutions in the academic years 2009/2010 and 2011/2012. This source does not contain data only referring to students who are foreign citizens. The other limitation was that only Hungarian labour market events were available and we had no information about the working life of students abroad. 1 to 3 years after graduation, most graduates are active labour market participants. Not surprisingly, few are still to be found in a higher education institution. Also, few of them are registered among the unemployed, and even those who are spend a passive period between two jobs.

Most of those reported to work abroad were graduates in the field of technology – one fourth of technology graduates in the “other” category were reported to work abroad. The other extreme seems to be graduates of medical sciences (*11 per cent within the “other” category*). We must emphasise, however, that these values are subject to inaccuracy due to the fact that not all graduates give feedback to their university on their job status. Only a negligible proportion of those who had passed their final doctoral examination had a job requiring no graduate qualification, while this is true of 21,6 per cent of those who had had no doctoral training. Average earnings prospective of this target group varies a lot by the field of study. Quite surprisingly, the highest wages were found in the case of doctoral graduates in social sciences, which is not characteristic of this study field at lower graduation levels. They are followed by the doctoral candidates and graduates of medical sciences and technology. The average monthly wages of the best earning group (*social science graduates*) are 2,5 times higher than the average monthly wages of the worst earning group (*theology graduates*).

Our online survey results show that 29 per cent of the international students in Hungarian doctoral studies have a job besides studying, whereas this ratio is 68 per cent among Hungarian students. The majority of doctoral students intend to continue working in their present job or would start looking for a job after finishing their doctoral studies. In the long run, most of the students expect to live in their

country of origin. Most of the international students who were interviewed hoped to find a job in one of the universities in or outside Europe. Some of them would gladly stay in Hungary if they found a good job corresponding to their qualification. They thought they had a good chance to find one because all universities need PhD graduates, especially ones who speak several languages. It is remarkable, however, that doctoral students from Asia (*Chinese mainly*) do not expect to work as researchers, they would rather start an enterprise in fields far from their doctoral studies. Apparently, their primary aim is to become resident in one of the European countries.

According to domestic students, earnings prospective of a researcher in the university are not too promising. For this reason, while the majority of them would prefer to become a researcher, most of them expect to find a job in the business sphere. In their view, they have a good chance there, because firms are hunting for highly qualified young people and remuneration is more competitive in the jobs offered by them. They expect to be able to find a job not too far away from home, at least within the region, and in a job possibly corresponding to their qualification, a job paying enough to feel that their investment in study time will be returned by their future income.

Employers' views about Hungarian doctoral training

Representatives of employers interviewed in our study believe that doctoral training is lagging behind in comparison to countries within the region. Many think that doctoral training is actually meant to be a recruiting method for some of the universities themselves and it is less open toward the business sphere. For this reason, even though university research is of a high quality, it is of little use for firms except for some good examples of cooperation between doctoral training and the business sector.

The people interviewed represent different approaches to doctoral training depending on their sectoral involvement. Representatives of the business sector involved in development based on up-to-date knowledge (*like developers of software applications, smart technologies, or producers of electronic devices*) expect doctoral schools to train "user friendly", practice oriented researchers and developers. In their opinion, the labs which were established by firms and universities in cooperation, provide a good professional base for doctoral schools. In contrast, several of our interviewees thought that the innovations of the coming 5 to 10 years (*e.g. new technologies, products influencing physiological processes, etc.*) will be based on new knowledge created in universities. This is why the classical type of doctoral schools are still needed, centres of pure research that lay emphasis on scientific skills including high level theoretical knowledge and research methodology skills. They agreed, however, that the soft skills of doctoral students and integration in the international research communities are indispensable anyway. Innovative thinking should characterise doctoral schools of the theoretical type as much as all graduate schools.

The greatest problem in Hungarian higher education is that our universities are "followers" rather than leaders in creating new knowledge. The leading universities of the world, by contrast, frequently come up with new ideas, for example, the cloud based solutions of communication which came from the university sphere. It would be extremely important that Hungarian universities could come up with new ideas that could attract business and investors.

The present situation is just the opposite: industrialists take the initiative, bring the themes to universi-

ties, and furthermore, they are the ones who initiate partnership with the universities. Business partners would gladly work with centres of excellence established in universities with high quality researchers and a more practice oriented focus. For this to be achieved, more focussed doctoral programmes and more attention to the development of soft skills would be needed as well as a more adaptive approach. It would be desirable to have a few great professors with international reputation at our universities who could attract high quality students and researchers. *(Although it has to be mentioned that some staff members who we interviewed reminded us of the internal tensions that such university policies could generate).* Well-designed strategy, focus and time would be needed to establish such centres of excellence. The ideas from international firms are related to current technology used worldwide but these technologies are not yet present in our universities. Two or three years are needed for the university and the students to learn these technologies through the lab operated by the firm and the university in cooperation.

The cooperation between firms and universities works well typically in areas and places where there is a common cultural background and traditions to build upon. The greatest spenders in Hungary today are mainly European (*German, Scandinavian*) firms such as Richter (*pharmacology*), Audi (*cars*), Ericsson (*informatics*). Such traditions can be built upon. In the case of firms with an Asian background, the question is always whether organic development in research and innovation can be expected in the long run.



SUMMARY

The ratio of foreign PhD students is much lower in Hungarian doctoral schools than in the majority of developed countries. Doctoral schools themselves are not interested in large scale inward mobility of PhD students: applications have to be rejected often due to capacity problems. There was a dynamic increase in the numbers of mobile students in the doctoral schools of social sciences, while high numbers of incoming foreign students but a slower growth rate can be observed in the case of doctoral schools in the humanities. The ratio of mobile students is still very low in doctoral schools in the fields of science and technology although there is some improvement there, too. With regard to internationalisation inside the institution, doctoral schools are more progressive than other parts of the university: much more foreign literature is used and sharing of international information is more effective than it is on the MA level. The international activities of doctoral schools are based mainly on the individual activities of the staff, most activities being international publication, research, and attendance of conferences. Doctoral schools, however, are much less present in the international higher education area, they rarely have contacts with doctoral schools abroad. Participation in international research is not organised at a system level, it is typically based only on contract with individuals.

