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THE CHANGING ACADEMIC PROFESSION IN INTERNATIONAL AND QUANTITATIVE PERSPECTIVES: A FOCUS ON TEACHING & RESEARCH ACTIVITIES

Report of the International Conference on the Changing Academic Profession Project, 2010

Organized by: Research Institute for Higher Education, Hiroshima University and
Research Institute for Higher Education, Hijiyama University

Research Institute for Higher Education
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The Changing Academic Profession in International and Quantitative Perspectives: A Focus on Teaching & Research Activities

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FOREWORD

As various kinds of university reform are increasingly in progress around the world, understanding of the nature of academic profession is essential for our deeper consideration of the higher education system in knowledge-based societies. The role of universities and other higher education institutions, I believe, has become far larger recently; and people, including those who work in their management and in development of higher education policy, have become more interested in the universities as institutions. For this reason, the Research Institute for Higher Education in Hiroshima University started a program of research on the Changing Academic Profession (CAP) in 2005. This five-year project has been funded by the Ministry of Education and Science as a grant-in-aid for scientific research headed by Professor Akira Arimoto, Director of the Research Institute for Higher Education, Hijiyama University and Professor-Emeritus of Hiroshima University. Before the conference in 2010, we had already held thee international conferences on this topic.

The fourth and final conference was held in Hiroshima in January 2010. This conference was organized by the Research Institute for Higher Education, Hiroshima University, Japan in cooperation with Hijiyama University, Japan. The title of the conference was "The Changing Academic Profession in International and Quantitative Perspectives: A Focus on Teaching and Research Activities". We invited speakers and participants from various countries which had all conducted surveys for both the 1992 Carnegie study and the 2007-08 CAP project to come to Hiroshima.

The conference, as you will find in this publication, was very fruitful and informative. Based on the outcome of this research project, we now move to a second stage of research on this topic, again funded by the Ministry of Education and Science, for another four years. We are hoping that, based on the experience of the past five years' several international conferences and workshops concerning the CAP, a better and more sophisticated understanding of the main comparative trends in the CAP and of the specific situation of the CAP in each country will continue to progress.

December 2010

Shinichi Yamamoto
Director and Professor,
Research Institute for Higher Education,
Hiroshima University

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Acknowledgement

We would like to acknowledge the invaluable contribution of Professor Keith J. Morgan, visiting professor at RIHE, Hiroshima University, who edited all the manuscripts in this report.

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Keynote Speeches

Differentiation and Integration of Research, Teaching and Learning in the Knowledge Society: from the perspective of Japan

Akira Arimoto*

Introduction

The Changing Academic Profession (CAP) project is an international research network consisting of some twenty countries throughout the world. As a part of the CAP project, financial aid from the Japan Society for the Promotion of Science (JSPS) allowed the Japan project to start in 2006. Amongst its activities, the Japan project has conducted three international conferences in 2006, 2008 and 2009.

These conferences have focused on a series of topics: "The Changing Academic Profession and Quality Assurance of Research, Teaching, and Governance: from a Perspective of International Comparison" in 2006; "The Changing Academic Profession in International Comparative and Quantitative Perspectives" in 2008; "The Changing Academic Profession over 1992-2007: International, Comparative, and Quantitative Perspectives" in 2009. The proceedings of these conferences have been published by the Research Institute for Higher Education (RIHE), Hiroshima University (RIHE, 2006, 2008, 2009).

This year, the Japan project is focusing on the topic of "The Changing Academic Profession in International and Quantitative Perspectives: a Focus on Teaching and Research Activities," by inviting the participation of eleven countries (strictly speaking, ten countries and one region): U.S.A., Argentina, Italy, South Korea, China, Germany, Malaysia, South Africa, Mexico, Hong

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Kong, and Japan), all of which conducted both the survey held in 1992 by the Carnegie Foundation for the Advancement of Teaching (Carnegie survey) and the survey held in 2007 for the CAP project (CAP survey).

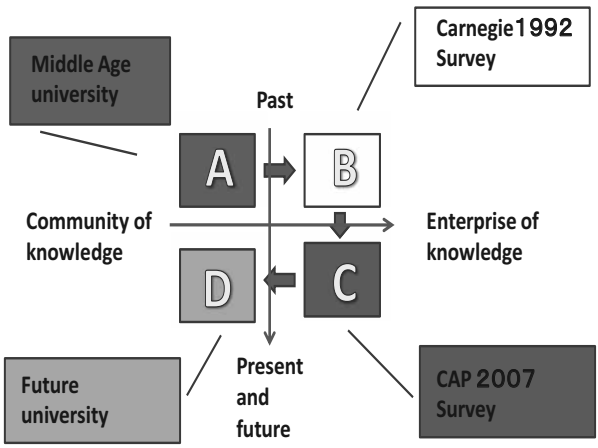


Figure 1. Changing university and academic profession

My keynote address this time is entitled "Differentiation and Integration of Research, Teaching, and Learning in the Knowledge Society;" in the previous conferences it has focused on "Institutionalization of Faculty Development with a Focus on Japan," in 2006, "International Implications of the Changing Academic Profession in Japan," in 2008, and "Changing Academic Profession in the World from 1992 to 2007," in 2009 (Arimoto, 2006a, 2008, 2009a).

Taking account of the conference's purpose as indicated in the title "The Changing Academic Profession in International and Quantitative Perspectives: a Focus on Teaching & Research Activities," my aim is to examine how the academic profession in the world has or has not changed between 1992 and 2007.

Figure 1 shows a framework of the concept that the university is changing from a community of knowledge to one of an enterprise of knowledge over the time span of past-present-future. Accompanying this trend, the academic profession is also changing from A through B, and C, to D. We analyzed the existing situations, B, in the Carnegie 1992 survey (Altbach, ed., 1996; Arimoto & Ehara, eds., 1996), and that of C in the CAP 2007 survey (Arimoto, ed., 2008; Kogan & Teichler, ed., 2007; RIHE, 2008, 2009).

Figure 2 indicates the framework imposed by a knowledge society for integration of research, teaching and learning in the knowledge society, even

though a differentiation of these functions is inevitable in the changing environment of the university. The effects of globalization and marketization in a knowledge-based economy are apt to exert great pressure for transformation of the university from a community of knowledge to an enterprise of knowledge. Higher education policy also supports this kind of pressure for the university's involvement in rationalization and efficiency by introducing a mechanism of selection and concentration.

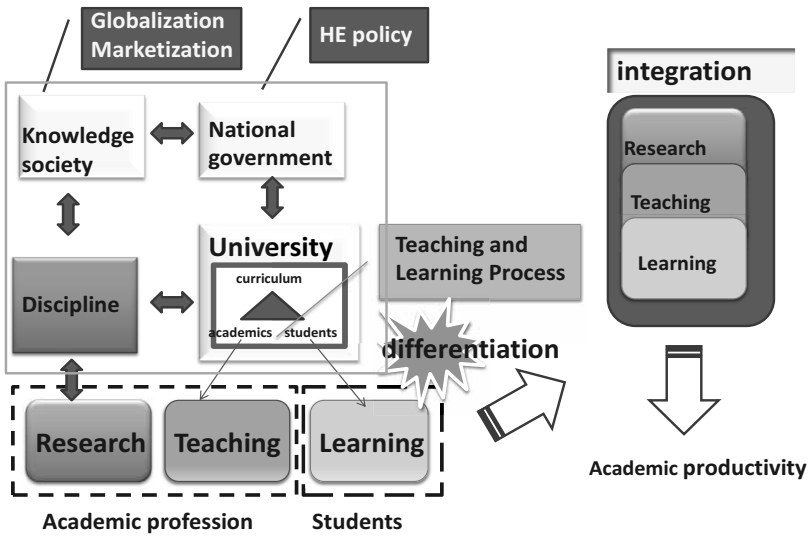


Figure 2. R-T-L differentiation and integration in the knowledge society

The pressure leads to differentiation, separation and fragmentation between research and teaching to the extent that the academic profession is divided into those with a research orientation and those with a teaching orientation. This pressure works not only on academics conducting research and teaching but on students engaged in learning. The teaching and learning processes in the classroom have difficulty in sustaining quality assurance due to a disintegration between teaching and learning. Without an integration of these functions, academic productivity itself is constrained by virtue of its dependence on integration of research, teaching and learning.

Based on these frameworks, this report will discuss four issues: the necessity for integration of research and teaching; the processes of manifest and latent differentiation; conflicts between differentiation and integration: the Carnegie and CAP surveys; and integration as the inevitable problem to be realized.

1. The necessity of integration of research and teaching

(1) Effects of the knowledge society

The knowledge society (that is, a knowledge-based society), can only exist on the basis of knowledge. Its impact on the university is indicated by the compatibility of value to both university and society. As shown in Figure 3, the university provided the basis of the original knowledge society through its functions of discovery, dissemination, and services based on knowledge before society at large shifted from an information-based society to a knowledge society. In this sense, the university was "a knowledge society 1", while the latter is "a knowledge society 2" (Arimoto, 2007; 2009a, p.4). Continuity of the two societies is clearly shown by the compatible existence in recent years of all the functions such as research (discovery of knowledge), teaching (dissemination of knowledge), and learning (understanding of knowledge) in the two societies. Gibbons and others have discussed how knowledge itself has been transformed from Mode 1, or pure knowledge, which was useful only to the university, to Mode 2, or applied and development knowledge, which is useful also to society as well as to the university (Gibbons, *et al*., 1994). In the emerging knowledge society, it is true to say that university and society at large could not continue to survive if they neglected research, teaching and learning because all of these have acquired an increased social significance.

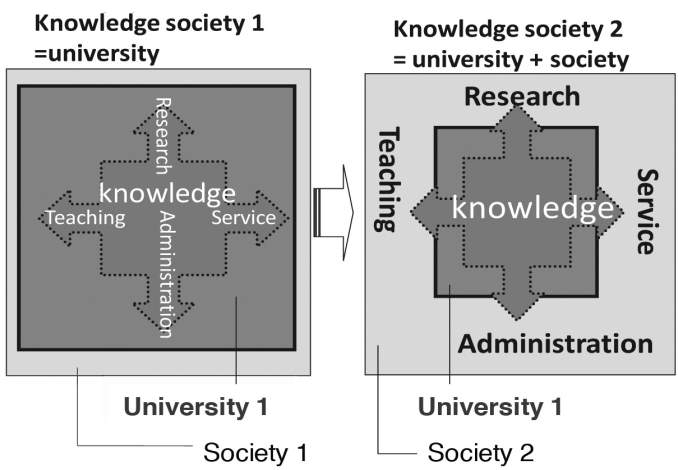


Figure 3. Development from knowledge society 1 to knowledge society 2

Individual national governments seek to enhance high research productivity by making extravagant investment in research activities in the universities,

which are seen a centers of excellence in a knowledge society, and also as indicators of the priority attached to the competition among countries in the rising worldwide knowledge society. By pursuing a doctrine of selection and concentration, the research universities have become recipients of investment of more resources. Yet the number of research universities is small. Of the total number of all universities and colleges, about 5% are committed as research universities to competition at the domestic level and relatively few of these are committed to the more severe competition at international level to achieve a position at the top of the world rankings. To this end their ability is evaluated by an indicator of academic productivity based on discovery of something original, important to the scientific and academic community. Study of academic productivity, a concept derived from that of scientific productivity originally used by Merton (ed., 1973), is inevitable, because the main role of the academic research enterprise is to raise academic productivity (Shinbori, 1973; Arimoto, 1981, 2007a, 2009b).

On the other hand, such results are obtained only by productive scientists and researchers who are educated and trained through a process of education from elementary level to university and especially at graduate level. To raise research productivity, it is necessary to raise educational and teaching productivity. Competition for high research productivity implies high academic productivity including both research and teaching productivity. Accordingly, a research-teaching nexus (R-T nexus) is inevitable. In addition, teaching is related to both the teaching and learning process and so learning is inevitably also integral to an increase in academic productivity. This logic is adaptable not only to a research university but also to a non-research university. As a result, a research-teaching-learning nexus (R-T-L nexus) is necessary and also quality assurance of its attainment is necessary (Clark, 1997; Nicholls, 2005; Arimoto, 2006a).

(2) Logic of academic discipline

The university is an organization developing various kinds of activities on the basis of knowledge (Clark, 1983). Knowledge allows an academic discipline to develop into advanced knowledge. Academic staff who specialize in their disciplines form groups and organizations in order to pursue research, teaching and service, and develop these activities (Becher & Parry, 2007; Parry, 2007). In fact, academics' conformity to the academic disciplines in which they specialize is fairly high as shown in the results of the CAP survey that compares the extent to which each of the following affiliations is "very important":

academic discipline (60.4%); department (34.2%); institution (33.1%) (Table 1).

Table 1. Degree of affiliations (%)

	Discipline	Department	Institution
1. very important	60.4	34.2	33.1
2. important	28.2	37.1	32.3
3. half and half	8.4	19.7	23.0
4. not important	2.0	6.5	8.3
5. not at all important	1.1	2.5	3.2

The functions of knowledge consist of understanding, discovery, dissemination, application, and control of knowledge, and correspond to the university activities of learning, research, teaching, service, and management and control respectively. Within an individual discipline, each of these functions is institutionalized.

Accordingly, it is natural that activities such as dissemination, application and understanding are undertaken on the basis of knowledge that is discovered in the process of dealing with disciplinary knowledge. Activities of research, teaching, understanding, and social service are usually identified as academic work intrinsic to the university. In this context, the university is an institution which deals with knowledge and conducts academic work integrating the functions of knowledge. Academics are given the role of pursuing this kind of academic work.

(3) Mechanism of academic work

Among many social institutions, the university is almost the only institution that is expected by society to pursue both the functions of research and teaching together. Accordingly, this is accepted as the university's continuing mission. A university is apt to become merely a school if it focuses solely on teaching without research, while it is apt to become a research institute if it focuses solely on research without teaching. These two functions are considered to be the two characteristics of academia. In other words, an academic is thought to be a researcher and teacher at the same time.

However, the compatibility of researcher and teacher started only about two hundred years ago when modern universities were institutionalized in the West. Before that time, academics were not researchers. Even in the 19th century, their work lay in requiring their students to show ability in recitation of a textbook in the classroom, not of teaching the findings of research activities

(Ushiogi, 1986, 2008). At that time few teachers were researchers. After research was accepted into the university, providing students with expertise discovered by research activities became a part of the teaching and learning process. In this sense, an attempt to integrate research and teaching has become fundamentally necessary in the modern university.

(4) Logic of the teaching and learning processes

Teaching, which shares an important position in the modern university together with research, operates on the dual basis of the teaching and learning processes. The teaching and learning processes comprise a trinity: an academic who supplies the teaching, a student who participates in the learning, and the curriculum which determines the teaching content. These three main elements maintain a culture and structure to reflect the ideals and aims of the academic organization.

Speaking from a macro perspective, the teaching and learning processes receive, directly and indirectly, various inputs from the environment, such as knowledge, society, and the national government, surrounding academia by way of academia's structures and functions that affect their environments by way of the academic organization. For example, reconstruction of knowledge affects the arrangement of the curriculum, teaching methodology, and learning method. The knowledge society naturally affects the trinity of curriculum, academic staff, and student, because it demands human training so as to meet its aims and goals. University policy seeks educational reforms, leading to changes in development identified through quality assurance of students' achievement by undergraduate education. In general, the aim of the teaching and learning processes is human development, with an emphasis on enhancement of output related to students' achievement, quality, and morale identified by quality assurance of the curriculum, academic staff and students.

The relationship between the quality and ability of the teacher is important. For academic staff and their disciplines, discovery as well as dissemination, that is to say research as well as teaching, is important. In this context, ability both as a researcher and as a teacher should be examined. The result of advanced research is reflected in the curriculum and at the same time contributes to the formation of quality and attainment derived from a student's creativity, imagination, and problem solving ability. As Harriet Zuckerman noted, Nobel laureates are apt to benefit from teachers who themselves were Nobel laureates, an observation that suggests the importance of the quality of academic staff in the teaching and learning process (Zuckerman, 1977).

There is also need to recognize the importance of tacit knowledge by which the researcher can provide students with ability by teaching through research. As Figure 4 shows, elite scientists can provide their students with a series of values and a climate and culture proper to their discipline which they, as would-be researchers, need to acquire for themselves. As pointed out by Zuckerman, the disciples of elite scientists are likely to become elite scientists themselves, because they can learn the structure of their teachers' creative thinking by their teaching through research. Paul A. Samuelson, 94, passed away on December 13, 2009: it is remarkable to note how many of his students became Nobel laureates in economics, and with such widely differing disciplinary philosophies: George A. Akerlof; Robert F. Engle III; Lawrence R. Klein; Paul R. Krugman; Franco Modigliani; Robert C. Merton; Joseph E. Stiglitz (Weinstein, 2009, p.6).

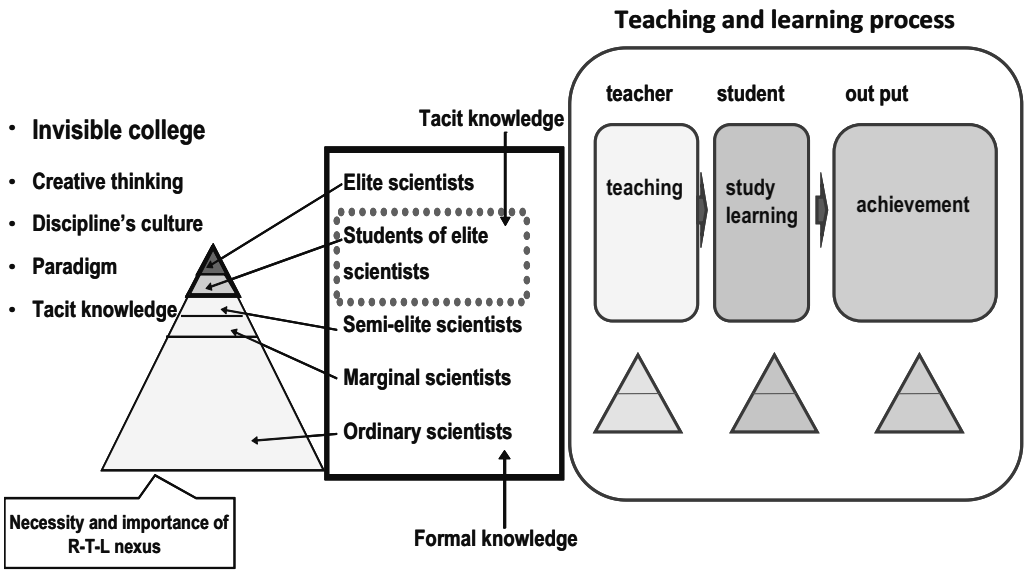


Figure 4. Elite scientists and teaching and learning process

On the other hand, ordinary scientists find it difficult to approach the invisible colleges of elite scientists. This is true not only for the most advanced researchers, such as Nobel Prize winners, but also for those ordinary researchers who now teach students in the stage of universal access so as to enhance their creative thinking, imagination, and problem-solving ability. In this context, the linkage of the role of research to the role of teaching, that is, the indivisibility of research and teaching is important. In other words, it follows that teaching

without research is insufficient for educating and training distinguished human resources.

Academic staff are not school teachers but learned scholars and also teachers as scientists and researchers. University teachers basically teach students in the classroom on the basis of research conducted in the laboratory, the library and the office, teaching through research as was the original meaning of the Humboldtian model of integration between research and teaching (Ushiogi, 2008). Academic staff differ from teachers in the elementary and secondary schools who do not conduct research. "At the higher level, the teacher does not exist for the sake of the student: both teacher and student have their justification in the common pursuit of knowledge" (von Humboldt, 1910[1970], p.249). Recently, there have been increasing numbers of academic staff conducting teaching without research in academia and to this extent it is undeniable that a traditional type of integration between research and teaching is of diminished availability. Teachers who teach university students without involvement in research may not be regarded as university teachers, although they may well be proficient as school teachers.

Similarly, university students differ from school students, because they are learners who need to learn on the basis of research to the extent that they will be taught by teachers, teaching through research.

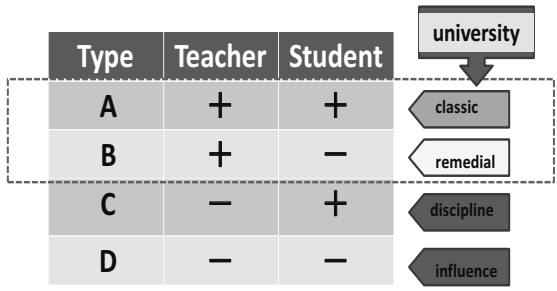
(5) Mission of the academic profession: integration of research, teaching and learning

As has been discussed, in a university a teacher mutually interacts with students by way of the curriculum. A student studies by means of accomplishing the educational tasks prescribed by the teacher as part of the teaching and learning process; at the same time students exercise their own initiative in augmenting their learning. The former implies study rather than learning in that it reflects the teacher's formal education more than the student's self-education (Clark, 1995). The latter implies learning and self-education rather than study and so it is possible to be conducted by students in places outside the classroom such as libraries, homes, and cities and towns. Of course, a borderline between the classroom and other places is not clear today when a credit system inserted in teaching usually needs completion of an assignment and homework outside the classrooms.

Given this situation, if we think about how a fruitful outcome of the teaching and learning process can be obtained, it seems to be necessary to seek a harmonious relationship of the teacher's intention for teaching and the student's intention for learning. In other words, the most effective output will be realized

by integrating the intention of teaching through research on the side of the teacher with the expectation of study through research on the side of the student.

Table2. Typology of relationship between teacher and student



Four categories can conceptually be created from combination of teachers' and students' intentions and expectations: Type A (teacher+, student+); Type B (Teacher+, student−); Type C (teacher−, student+); Type D (teacher−, student−) (Table 2). Type A is thought to be decreasingly accessible today, though it represents the standard traditional type of the teaching and learning process. On the other hand, types B, C, and D, though they are deviant types, seem to be more acceptable today. Even so, Type D exists only conceptually and remains unavailable in practice. Among these four types, the two types, A and B, which have a teacher's positive intention (+) lie inside academia; while the two types, C and D, which have a teacher's negative intention (−) lie outside of academia. Type B in particular is likely to become more common at a time when the emerging universal stage of higher education has inevitably created a situation of super-diversification of students with less enthusiasm and ability for study and learning. This is evident in the fact that a series of new approaches to these students, such as remedial education and first-year education, is thought to be appropriate to their needs. If we are to expose these students to a knowledge society, or even an inquiring society, it is clear that the R-T-L nexus becomes more and more important so as to develop their academic achievements by transforming their intentions from negative to positive.

2. Processes of manifest and latent differentiation

Various factors affect the conditions of increasing differentiation between research and teaching: the institutionalization of the graduate school; the establishment of academic associations; centers of learning; the publication and

citation of papers; the rise of the research university; the institutionalization of ranking; and the reward system.

(1) The institutionalization of the graduate school and the research university

As a result of the institutionalization of science into the university since the 19th century, the logic that had prevailed in the scientific community conquered the whole academic community and displaced the previous logic of teaching that had prevailed hitherto. In reality, however, the process was gradual and during the period of change, while a research orientation was becoming dominant, conflicts were deepened.

The institutionalization of graduate schools is related to the rise of the research universities, because these are usually characterized by graduate schools. According to the Carnegie classification, the research university is considered to occupy the top of the hierarchy of academic social stratification (Carnegie Commission on Higher Education, 1976). "Research universities are defined here as academic institutions committed to the creation and dissemination of knowledge in a range of disciplines and fields and featuring the appropriate laboratories, libraries, and other infrastructure that permit teaching and research at the highest possible level." (Altbach, 2009, p.15). Talcott Parsons ranked the research university at the top of American higher education institutions (Parsons & Platt, 1973). A research university is oriented to research just as its name implies, being expected to have higher research productivity.

(2) The establishment of academic associations

In origin, academic associations were related to academic disciplines and academic work so that they have had close connection to academia since they were established in the 19th century (Brubacher & Rudy, 1968; Oleson & Voss, eds., 1979). In fact, the pro-research climate of academic associations had a profound influence on academia. This is indicated by the studies undertaken by the members, their shared culture, norms, methodology, and way of thinking, by emergence of technical terms proper to the specific academic discipline, and by contributing articles to the association which in turn recognizes them by their acceptance and publication in a journal. Publication of articles is identified with research productivity, which differs from academic productivity, which combines both research productivity and teaching productivity. The separation of research productivity in this way marks the division of the labor of research from that of teaching.

(3) Publication and citation of papers

The importance of research productivity inevitably produces a series of indicators that attempt to count it adequately. These include: the number of papers produced; the Science Citation Index (SCI), which counts the number of citations; and the Relative Citation Impact (RCI), which measures the impact of an original paper on other papers. A researcher's prestige and reputation are commonly assessed by the measures of quantity and quality of research productivity provided by these indicators.

(4) Center of learning

The achievement and reputation of a center of learning (COL) (*cf.* Ben-David, 1977) or center of excellence (COE) is often assessed by research productivity. The "Mathew effect" works in the sense that such centers accumulate prominent scientists, researchers, scholars and international students from all over the world. The operation of this effect reveals that establishment of the current centers of learning has a close relationship to the institutionalization of science and research into academia.

Examination of the shift of the global COE identifies the importance of the extent and quality of research productivity, although the quality of academic productivity may provide a conclusive factor. The quantitative and qualitative sides of academic productivity are evaluated by various indicators in order to identify the overall COE ranking: eponymy, number of papers, SCI, RCI citations, various international awards including Nobel prizes, patents.

Among these, eponymy is the custom of identifying new knowledge by the name of its discoverer or the location of its discovery. The dictionary of eponymy (Ruffner, 1977) lists eponymous names (20,972 cases) as well as eponyms (12,867 cases). A study of eponymy, which includes an analysis of the dictionary, clarifies comparatively the amount of eponymy in every country. According to the data obtained, it is interesting that research productivity has been concentrated sequentially in specific countries: France, the U.K., Germany, and the U.S. The analysis corresponds to a shift of the global COE from France, through the U.K., to Germany, and then to the U.S., from the 17th century to the 21st century (Shinbori, ed., 1985; Arimoto, ed., 1996).

This observation suggests that the global center of learning, where academic productivity is highest in the world, is able to shift gradually. It also suggests there are associated phenomena of relative upward and downward mobility, of brain drain and gain, and of a geographical center and a periphery.

The share of the number of papers produced by country illustrates the effect.

An analysis of the National Science Indicators, 1981-2004, which was made by Thomson Scientific, and covered 781,000 papers, reveals the share of each individual country. In 2004, the U.S. ranks first with 31.7%, followed by Japan (9.6%), Germany (8.5%), the U.K. (8.4%), France (6.2%), and all others (35.7%) (MEXT, 2006). A similar international comparison by using SCI data gives similar results with Japan placed high in the list, next to the U.S. The Japanese government, however, pays particular attention to the quality of academic productivity and prefers criteria such as those provided by the SCI and RCI, in recognition of the necessity of improvement in quality in order to catch up with other advanced countries. For example, from analysis of the RCI data from 1985-2004 (*idem, ibid*) "Japan's RCI proportion is less than 1%, putting it in a position relatively lower than other major selected countries. Whereas the RCI figures for Japan and the United States have stayed relatively stable since 1981, they have risen in the other major countries, with particularly strong increases seen in recent years for the United Kingdom, Germany and France." (MEXT, 2006)

It is interesting to compare these results with the results of the CAP survey especially with respect to research productivity in the U.S. and U.K., because these two countries are considered to be ranked at the top of the stratification. Responses to the question of "How many scholarly contributions have you completed in the past 3 years" cover a wide range of publications (Table 3). The categories "scholarly books you authored or co-authored", "scholarly books you edited or co-edited", and "articles published in an academic book or journal" are particularly relevant. The best five countries in the total ranking of 17 countries with respect to these categories are (1) Japan, (2) Germany, (3) Korea, (4) Portugal and Hong Kong. Japan was also ranked first in the 1992 Carnegie survey (Arimoto & Ehara, eds., 1996) and so it has retained the leading position over fifteen years, although overall academic working conditions have deteriorated so much.

According to these results, research productivities in the U.S. and the U.K. are much lower than expected. It is natural then to question why these countries, as centers of learning, possess so little productivity. Are there proportionately fewer academics belonging to the COE who are sampled in the CAP survey? Are most of their universities and academics mediocre in academic productivity? Is sampling problematic? These questions occur, but it cannot be denied that the survey shows low research productivity in both countries.

Table 3. How many of the following scholarly contributions have you completed in the past three years?

	AR		AU		BR		CA		CH		FI		DE		HK		IT		JP		KR		MY		MX		NO		PT		UK		US	
Scholarly books you authored or co-authored	0.6	7	0.3	16	1	8	0	15	1	5	0.4	14	0.4	11	0.5	10	0.9	4	1.9	1	1	3	0.6	6	0.4	12	0.5	9	1.3	2	0.4	13	0.2	17
Scholarly books you edited or co-edited	0.4	8	0.2	17	0	14	0	12	1	2	0.3	10	0.5	4	0.4	7	0.5	6	0.5	5	0.7	3	0.3	9	0.2	16	0.3	13	3.9	1	0.3	11	0.2	15
Articles published in an academic book or journal	5	12	6.9	7	0	14	6	8	9	5	5.2	11	8.2	6	9.4	3	8.6	4	9.8	2	18.8	1	3.9	15	2.3	17	5.8	10	3.4	16	6	9	4.3	13
Research report/monograph written for a funded project	2.5	2	1.4	9	1	10	2	8	1	11	1.2	12	2	3	1.6	5	1.6	4	1.5	6	2.6	1	1.5	7	0.6	17	0.7	16	0.7	15	1.1	14	1.2	13
Paper presented at a scholarly conference	7.5	5	5.7	8	6	11	8	7	3	17	4.5	14	6.5	6	7.5	4	7.5	3	6.3	7	7.6	2	5.6	9	3.1	16	4.8	13	4.1	15	5.5	10	5.3	12
Professional article written for a newspaper or magazine	1.7	3	1.2	10	2	6	1	8	1	15	1.3	9	1.7	4	2.3	1	1.8	2	1.5	7	1.1	12	0.9	14	1.2	11	1.6	5	0.8	17	0.8	16	1	13
Patent secured on a process or invention	0.1	15	0.1	10	0	16	0	9	0	3	0.1	13	0.3	4	0.2	5	0.1	8	0.5	2	0.7	1	0.2	7	0	17	0.1	12	0.2	6	0.1	14	0.1	11
Computer program written for public use	0.1	6	0.1	11	0	17	0	7	0	1	0.1	12	0.1	5	0.1	14	0.1	15	0.1	13	0.1	9	0.1	10	0.2	4	0.1	16	0.3	2	0.2	3	0.1	8
Artistic work performed or exhibited	0.4	9	0.4	8	0	12	0	10	0	16	0.3	11	0.5	4	0.2	13	0.1	17	1.4	2	0.4	7	0.2	14	0.5	6	0.5	5	36.1	1	0.2	15	1.3	3
Video or film produced	0.1	14	0.1	12	0	7	0	13	0	15	0.1	16	0.2	2	0.1	9	0.1	11	0.1	8	0.1	17	0.2	5	0.2	3	0.1	6	31.1	1	0.1	10	0.2	4
Others	0	16	0.2	14	1	2	1	4	0	15	0.3	11	0.3	12	0.3	9	0.3	13	*		0.5	7	0.3	10	0.5	6	0.6	5	10.9	1	0.4	8	0.7	3
Total	**8.8**		**11.1**		**10.6**		**9.2**		**9.5**		**12.1**		**5.5**		**7.3**		**7.9**		**5.3**		**5.7**		**9.6**		**11.4**		**10**		**7**		**11.2**		**10.2**	
Total Ranking	**7**		**13**		**13**		**8**		**9**		**17**		**2**		**4**		**6**		**1**		**3**		**10**		**13**		**11**		**4**		**13**		**11**	

(5) The institutionalization of ranking

Ranking of universities, with an emphasis on research, has appeared as a part of the evaluation system. The shifts in location of institutional COE are usually evaluated by such ranking. At the core of ranking is the large weight attached to research productivity and research orientation, although indicators other than research are highly significant. In the U.S., ranking has lasted for more than eighty years, from 1925 until today, so that the hegemony of research-ism is firmly established (Arimoto, 1981). Its now universal acceptance has affected academics as well as institutions but also been recognized by governments, societies, and public interest worldwide. The growth of interest in ranking has been further spurred by publication of the surveys of the Times Higher Education (THE), of Shanghai Jiao Tong University, and of the World News and Reports.

According to the world rankings, the center of learning is located in the U.S. and the U.K. There is a periphery located in other countries, notably in Asia, Africa and Latin America. "While there will always be centers and peripheries, the centers will be mainly concentrated in the major industrialized countries for the foreseeable future. There is room, indeed a necessity, for a wider dissemination of research capacity throughout the world." (Altbach, 2009, pp.15-16) There is a South-North problem of a differentiated society with respect to knowledge and brain gain and brain drain worldwide.

How has this happened? Why is there a differentiated society? Many reasons must be working. There are macro-level factors such as social systems; there are mid-level factors such as the institutional and organizational traits of science and engineering; and there are micro-level factors such as scientific socialization (Arimoto, ed., 1996).

Such matters − and others − are important indeed. Integrated research and teaching must lie behind the fact that both the U.S. and the U.K. are ranked at the top of the hierarchy; the U.S. especially provides an example. Of course, research productivity is not a unique indicator; other indicators are major contributors to estimates of ranking. For example, THE uses indicators such as: research quality, teaching quality, graduate employability, and international outlook (London Times, 2008). Teaching is also used directly and indirectly as an indicator.

Internationally, competition among systems, universities, and academics has been intensifying. In this kind of environment, all academics are naturally confronted with much pressure for research productivity not only in research universities but also in non-research universities. As is shown in Figure 5, the

CAP survey asked academics worldwide whether "High expectations to increase productivity are a threat to the quality of research." The results show the total score of those who "strongly agree" and "agree" is 60%, while for those who "strongly disagree" and "disagree" it is only 16%.

Moreover, with this pressure, almost all institutions, whether high or low in the rankings, are committed to the research productivity competition. This was seen in a survey in Japan in 2007, when academics in the research universities showed research productivity higher than those in non-research universities (Arimoto, 2007). This kind of competitive atmosphere is probably recognizable worldwide. National projects have appeared, designed to produce world-class universities, with titles such as the 21st century COE project in Japan, the BK21 project in Korea, and the 211, 985 and 111 projects in China (*cf.* Altbach & Umakoshi, eds., 2004).

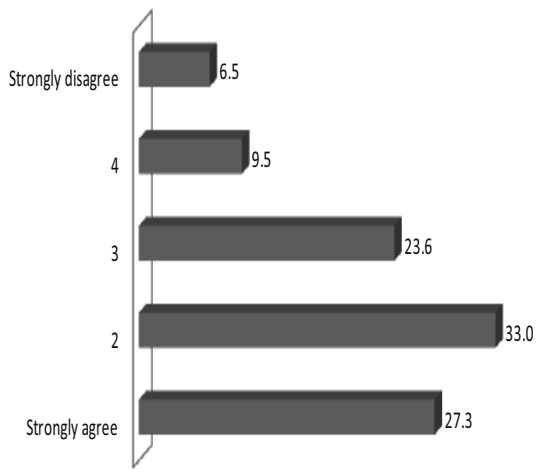


Figure 5. High expectations of increasing research productivity are a threat to the quality of research (%)

(6) Reward system

The ranking system is related, directly and indirectly, to the reward system because it forms part of the evaluation system on which the reward system is based. Modern society puts greater value on universalism and achievement than on particularism and ascription, by assessing people from this kind of perspective. Accordingly, the reward system has a close relationship to this perspective. For example, the concept of CUDOS, which was developed by Robert Merton to deal with the ethos of scientific society, is adaptable to science

in academia (Merton, ed., 1973; Arimoto, 1987). There, the reward system, including values such as communality, universalism, organized skepticism, and disinterestedness, is the operational standard.

Evaluation of research productivity based on universalism may well be suitable for an ethos of science. In a climate in which the research paradigm prevails, as previously discussed, the reward system responds to the priority attached to research. Research evaluation undertaken in international and national academic forums is given objective and cosmopolitan characteristics, while evaluation of teaching, made by students' reactions in the classrooms and by presidents' reactions in their awards, possesses merely local characteristics.

Various awards having internationally high visibility also contribute to a reward system at the pinnacle of which the Nobel Prize is located. The reward system has a close relationship with prestige and power and therefore with determination of the pecking order of universities. The global center of learning is structurally strongly connected to this pecking order, both institutionally and nationally. Within these systems, it can be seen to connect to those academics as the scientists and researchers who are actual or potential Nobel laureates.

In this context, the probability of realizing this effect is high in the research universities in the U.S. There they have gathered many Nobel laureates: for example, in the case of physics, institutions with more than 9 Nobel laureates are as follows: MIT, 19; Columbia,19; Princeton,13; Chicago, 13; UCB, 12; Stanford, 12; Harvard, 12, Bell Institute 12, Caltech, 12; Minnesota, 9; all of these except the Bell Institute are universities. In the case of chemistry, institutions with more than 4 laureates are as follows: UC Berkeley, 16; Harvard, 13; Chicago, 9; Cornell, 5; Columbia, 5; MIT, 5; Rockefeller, 5; Princeton 4; all of these are universities (MEXT-NISTEP, 2007).

3. Conflicts between differentiation and integration: the Carnegie and CAP surveys

(1) Three types of orientation to research and teaching: the CAP Survey

Differentiation and separation between research and teaching are being promoted in spite of the demand for recognition of their nexus. This is clearly evident in academics' consciousness throughout the world. In this context, research on academic productivity based on academics' consciousnesses has provided some interesting results. An analysis of academics' orientation to research and teaching based on the Carnegie survey identified three types: a

research orientation; a research and teaching orientation; and a teaching orientation (Arimoto & Ehara, eds., 1996).

a. The first type, designated a German model, stresses research more than teaching, and is found in countries such as the Netherlands, Japan, Germany, Sweden, and South Korea.
b. The second type, designated an Anglo-Saxon model, stresses research and teaching equally, and occurs in countries such as the U.K., the U.S., Australia, and Hong Kong.
c. The third type, designated a Latin American model, stresses teaching more than research, and is found in countries such as Argentina, Chile, and Brazil.

Identification of the three types confirms that the global academic profession consists of many sub-divisions, which reflect the influence of the various cultures, environments, and attitudes peculiar to the national academic systems, institutions, and organizations to which they belong. In particular they give rise to varied reactions with regard to their orientations to research and teaching.

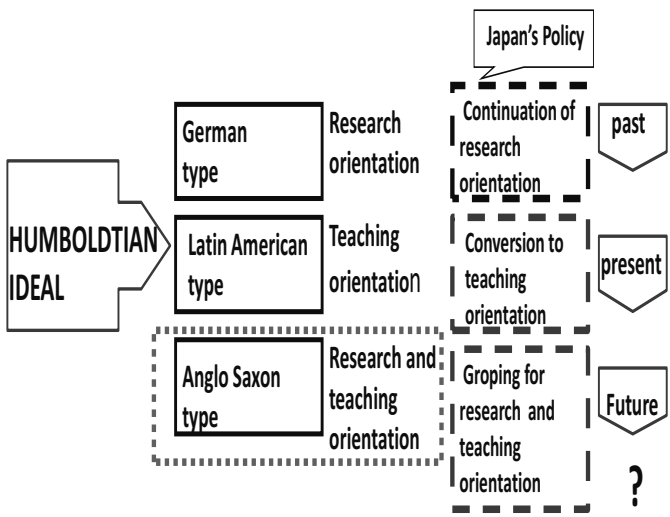


Figure 6. Humboldtian ideal: past, present and future

As Figure 6 indicates, the Anglo-Saxon model seems to approach the Humboldtian ideal most closely in the sense that it seems to conform to the pattern of integrated research and teaching. On the other hand, the German

model, with its strong emphasis on research, tends to pay too much attention to academic staff as researchers and too little to students as learners. In contrast, the Latin American model puts more weight on teaching and the students and less on research and the academic staff. In this respect, the situation in Japan is challenging. Is it possible to change from the research orientation in the past and the teaching orientation of current government policy to achieve a balanced research and teaching orientation in the future?

(2) Reinforcement of research: CAP survey

Although only ten countries participated in both surveys, direct comparison of some of the results obtained in the Carnegie and the CAP surveys is possible, because they both asked some closely similar questions. As a consequence, it is surprising to discover that the results differ significantly from the expectation that the Humboldtian ideal model would have been realized to a greater degree during the past fifteen years.

The results from the CAP survey (Figure 7) reveal that the German model has extended to a number of countries, while conformity to the Latin American model has declined. The Anglo-Saxon model, which was thought to approximate to the ideal has also declined to a considerable extent. Of those conforming to the German model, Germany (research 62% / teaching 33%) and South Korea (68% /32%) have strengthened their research orientation and Japan (72% / 28%) has kept almost same proportions as fifteen years ago. Among the countries which conformed to the Latin American model, Brazil (49% / 51%) now shows an Anglo-Saxon pattern and Argentina (57% / 43%) has shifted to a research orientation, though Mexico (38% / 61%), a new comer, reveals a teaching orientation. Among the countries which belonged to the Anglo-Saxon model, the U.K. (67% / 33%), Australia (60% / 30%), Hong Kong (63% / 37%) all shifted to a research orientation, while only the U.S. (44% / 56%) remained unchanged. Among the new comers, almost all countries except China (47% / 53%), South Africa (47% / 53%), and Malaysia (47% / 53%) show a strong conformity to a research orientation as follows: Norway (83% / 17%), Italy (77% / 23%), Canada (68% / 32%) and Finland (65% / 35%).

Summarizing these findings, we can recognize the fact that the academic profession worldwide has reinforced its research orientation during the fifteen years since 1992. William Cummings pointed out at the CAP Conference in 2009 that "While several countries exhibit an increased stress on research, no country for which there is data for both 1992 and 2009 indicates a notable increase in the stress on teaching." (Cummings, 2009, p.41) This fact means

that the manifest increasing development of differentiation between research and teaching is now directly opposed to attainment of a Humboldtian ideal of integrated research and teaching.

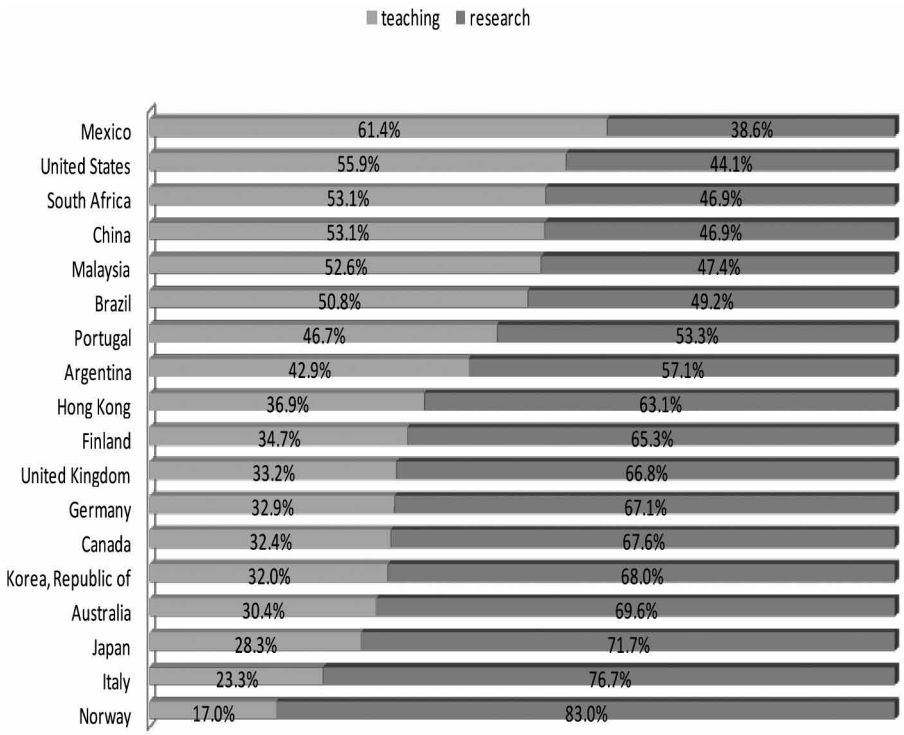


Figure 7. Teaching and research orientation by country, 2007

(3) Causality

Reinforcement of a research orientation throughout the world can be attributed to a range of conditions and causalities. They include: the effects of social changes; change to the reward system; the research orientation of higher education policy; an increased division of labor in higher education institutions.

International social changes during the fifteen years have strengthened: globalization, the orientation of the knowledge society and marketization, all of which have increasingly affected the research orientation. In particular, penetration of the knowledge economy into academia has developed an environment of knowledge enterprise in academia to the extent that higher education systems worldwide have pursued indicators of rationalization of knowledge efficiency, promoting the strength of indicators of research at the

expense of teaching.

International competition has been strengthened in accordance with international marketization of higher education. One result is that the connection of research to the reward system has become stronger than that of teaching. By this mechanism, the dependence of the reputation of institutions on research and researchers has become widely established both inside and outside academia. Academic policy has focused on a collection of internationally prominent researchers commanding high salaries in order to enhance an institution's visibility and reputation. Relentless competition among institutions has become a common occurrence in the process of scouting and headhunting distinguished researchers. As has already been discussed, headhunting Nobel laureates has become custom and practice for research universities (MEXT-NISTEP, 2007).

Research productivity disproportionately affects the reward system in the promotion as well as the recruitment of academic staff. While internal promotion is nominally determined by academic productivity, the facile quantitative evaluation of research productivity tends to outweigh the less precise estimates of teaching productivity. Moreover the ability to achieve recognition for excellence in research more rapidly than in teaching may also contribute to the increasing commitment of younger academics to a research orientation

Reinforcement of research orientation by higher education policy has been strengthening the research orientation of academics remarkably. For example, in the U.K., a policy of support for a teaching orientation was strengthened in 1997; conversely, since 2003, it is a research orientation that has been reinforced. As a result, universities can now be divided into three categories: research, teaching and a combination of the two (Kogan, *et al*., eds., 2006, p.109). This inversion of policy forced a change in the consciousness of academics. In contrast, in the U.S., a policy of integration of research and teaching has been sustained consistently. In Japan, while the traditional research orientation has been maintained strongly for many years and continues today, national policy has been focusing on a teaching orientation in recent years (Central Council of Education, 2005).

Finally, there is the division of labor and its effects. Differentiation of the higher education system from a single tier to multiple tiers has affected academics' consciousness and behavior to a considerable extent. In the U.S., for example, there is a separation of community college courses, undergraduate courses, master's courses, and doctoral courses. In general, academics in the

graduate schools must become research orientated to meet the demands of a research university, while their counterparts in the undergraduate schools must adopt a teaching orientation to meet the demands of general education. Of course, practice may differ from theory. In U.S. academia, where the amount of integrated research and teaching is fairly high, it is evident that quite a few academics in undergraduate schools are involved in research (*cf*. Clark 1997).

In contrast, in Japan, academics' consciousness was not differentiated so much as, unlike the U.S., the graduate and undergraduate schools were not clearly separated. The results of the 1992 survey showed almost the same extent of research orientation among academics in both the undergraduate and graduate tiers. Recently, differentiation in the levels of institution and consciousness is assumed to have occurred as a lot of academics have moved to graduate schools from undergraduate schools since 1991 when a national policy stressing the graduate school was introduced into higher education institutions in Japan (Arimoto, 2009b).

4. Integration is the inevitable problem to be realized

(1) Characteristics of the academic organization

As was discussed previously, integration of research and teaching has been facing increasing difficulty of realization owing to the effects of the dominant research paradigm. However, considering that among many institutions only the university has the function of research and teaching as its two indispensable vehicles, achievement of integration presents an inevitable problem to be solved as soon as possible.

a. The core of work in the academic system is research and teaching as its two vehicles. No educational institution other than university has two systemic and organizational functions.
b. In a knowledge society, research-based teaching is necessary at all levels of education from primary education to tertiary education. Furthermore, for a system of lifelong learning from birth to death, research-based teaching is necessary in order to develop human education for independent and autonomous thinking.
c. As part of their evolving professionalism, academics are expected to pursue teaching through research rather than merely by instruction. It is valuable for academics to recognize the abilities of students for problem-solving as well as the creativity through tacit knowledge embedded in academics as

researchers. Students as learners have high possibilities of achievement from study as well as from learning better from academic staff with research ability rather than from those who lack it.

(2) Reconsideration of scholarship: the mission of the academic profession

Considering in the 21st century that integration of research and teaching seems to have become fairly difficult to realize, we have to think that integration of research, teaching, and learning (a nexus of R-T-L) may be even more difficult to realize. This is true, and some scholars have already discussed the problem of reconsideration of scholarship as well as the R-T-L nexus (Clark, 1997; Boyer, 1990; Nicholls, 2005).

For academics who have been committed to a research orientation it is especially difficult to change their consciousness and conception of scholarship as would be necessary for the innovation of a new nexus. For example, according to the Carnegie survey in 1992, Japanese academics indicated that the proportion of the age cohort enrolled in universities should be less than 40%, although at that time the enrollment rate was 45% (Arimoto & Ehara, eds., 1996, pp.39-50). This discrepancy between academics' consciousness and the real enrollment rate persisted to 2007 when, in the CAP survey, the preferred enrollment remained at less than 40% despite an actual rate of 55%, corresponding to attainment of universal higher education (Ogata, 2008). The survey responses indicate that the existing student enrollment rates were far beyond the expectation of academics, which reflected their research orientation as well as a view of the university still in the elite stage of higher education.

However, as discussed previously, the greater importance of learning in addition to that of teaching is increased in meeting the needs of the universal stage of higher education development. Accordingly, it appears inescapable that achieving an R-T-L nexus will be extremely difficult in an environment that has yet to accept an R-T nexus. Academics globally who, like Japanese academics, are committed to a research orientation, have to resolve this difficult problem at all costs.

Concluding remarks

1. Within fifteen years, social changes have exerted a great deal of pressure in transforming academia from a community of knowledge to an enterprise of knowledge. The pressure has considerably affected the academic profession in its consciousness and behavior. In the emerging knowledge society, which

coexists both in society overall and in the university, knowledge functions such as discovery, dissemination and application are increasingly important for the academic activities of research, teaching and service that comprise academic work, and especially for research and teaching as its two vehicles.

An integration of research and teaching (an R-T nexus) has become necessary in the teaching and learning process. Both teaching through research and learning through research are necessary, even though academics undertake teaching to conform to the curriculum and students also undertake learning. Considering these factors, integration of research and teaching, and, even more, integration of research, teaching and learning (an R-T-L nexus) is necessary.

2. In reality, however, such integration is rarely achieved due to the increasing tendency for differentiation between research and teaching. Many of the factors that contribute to this have been analyzed in this paper: the institutionalization of the modern university; the shift of the center of learning; academic productivity. The concept of the Humboldtian model was adaptable a century ago, at the time of institutionalization of the modern university, but this model is hardly adaptable to the universal stage of higher education today. Conversely there is a trend of encouraging teaching without research that necessarily drives academic staff either towards research or towards teaching.

Conflicts between research and teaching are evident in many countries. Indicators such as analysis of eponymy, the numbers of papers, SCI, and rankings, testify that the center of learning has shifted and also that a research orientation has been greatly strengthened around the world. A comparative discussion about academic productivity contrasts a mode of closeness based on particularism and ascription with one of openness based on universalism and achievement. By paying attention to the tight connection of openness and academic productivity, it is seen that research productivity is also related to the climate of openness. This discussion is, of course, related to the subject of my keynote address to last year's CAP conference. At that time I analyzed the indicators of openness as follows: competitiveness; mobility; control of inbreeding; a pyramidal type of construction of academic staff; single and multiple tier structures; the chair system and the department system; the apprenticeship system and the collective education system. Consideration of these indicators testified that openness is observed in Germany and the U.S. but not in Japan (Arimoto, 2008, 2009a).

3. Concerning the conflict between differentiation and integration of teaching and research, the Carnegie survey identified conformity to three types: a research orientation; a research and teaching orientation; and a teaching

orientation. By the time of the CAP survey, the distribution between these types had changed. Conformity to a teaching orientation and to a research and teaching orientation had decreased, but to a research orientation it had increased. Particularly noteworthy is the decline in the research and teaching orientation, the type closest to the Humboldtian ideal, which relative to the Carnegie survey had declined in all countries except the U.S. Among the factors that may have contributed to the increased conformity to a research orientation are the effects of social change, the changes to the reward system, the research orientation of higher education policy, and the divisions within the higher education system.

4. Increased differentiation between research and teaching can be readily attributed to factors such as: institutionalization of the graduate school; establishment of academic associations; identification of centers of learning; assessment of productivity and citations of papers; the status of the research university; the reward system; and the institutionalization of ranking. Considering the way in which the process of differentiation has spread globally, we are forced to recognize the difficulty of integrating teaching and research.

Nevertheless, integration is necessary. In the 21st century when, unprecedented universalization will be steadily promoted, it has to be said that integration is necessary, not only to establish an R-T nexus but also to extend it to an R-T-L nexus, if the increasing demands of students' learning are to be met. As discussed in this paper, consideration of the present situation, in which creating even an R-T nexus is difficult, will necessarily impose greater difficulty if an R-T-L nexus is to be realized. In this context, the academic profession worldwide is confronted with the challenge of finding the means to achieve this essential development.

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Comparing the Academic Research Productivity of Selected Societies

William K. Cummings*

Introduction

Nations[1] differ in their levels of academic research productivity, and an important component of each nation's productivity is the productivity of individual scholars. Smaller nations with relatively productive scholars can seek to match the productivity of a larger nation if the latter's productivity is low. International statistics on aggregate national research productivity indeed suggest that the productivity in some of the larger nations is leveling off and that some of the smaller nations, notably those referred to as Asian newly emerging societies, are catching up. This paper drawing on CAP data seeks to compare and examine both the current pattern of academic research productivity for selected nations and to compare recent trends (1992 to 2007).

The data and their limitations

The CAP Project encouraged relatively large national surveys of the academic profession in 20 countries conducted mainly over 2007; for several of these countries, a similar survey (similar in terms of sample design and many of the questions of the common instrument) was conducted in 1992 under the sponsorship of the Carnegie Fund for the Advancement of Teaching.

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[1] Most of the samples of the CAP study were from "national" academic populations. Hong Kong, a region of China, is an exception. The CAP study included samples of academics both from mainland China and from Hong Kong. In the discussion below we will sometimes refer to Hong Kong as a nation, even though the correct designation should be region.

The CAP Survey covers all academic fields. As the most prominent international comparisons of research productivity focus on the productivity of research articles by academics in the science and engineering fields (inclusive of psychology and the social sciences), we will similarly narrow the focus. In other words, the results presented below are for the sub-sample of academics in science and engineering.

Respondents were asked an extensive battery of questions on research context and productivity. Several indicators of productivity were collected including a question on numbers of research articles published in the last three years; this question is the closest the survey comes to measuring articles published in refereed journals and thus will be the focus of the analysis below.

There are inevitably limitations to this approach. The number of articles published is self-reported, and there are possible societal differences in the interpretation of this and other questions. So our attention will be on relative differences, rather than absolute scores.

The recent pattern

Indeed there are big societal differences in the level of average research productivity with Korea reporting a publishing rate that is two and a half times greater than that of the U.S. Pulling down the U.S. average is the fact that a relatively large proportion of U.S. academics have not published a single article over the past three years; the failure to publish is interesting in view of the U.S. myth of publish or perish. The U.S. publication rate is closer to Brazil or Portugal than that of most of the other advanced economies included in the CAP survey.

Table 1. International comparison of research article productivity 2007*

Country	Article Average 2007	% None 2007	Country	Article Average 2007	% None 2007
Korea	11.59	1.9	Portugal	5.64	19.3
Hong Kong	10.6	7.1	Finland	5.5	21.1
Japan	9.71	11.3	Norway	5.22	18
Germany	9.3	13.4	USA	4.95	26.2
China	9.2	15.8	Malaysia	4.77	29.3
Italy	8.8	6.2	Brazil	4.74	21.4
Australia	7.25	11.4	Argentina	4.31	26.6
UK	6.88	10.9	Mexico	3.16	40.7
Canada	6.6	10.9	S. Africa	3.02	28.5
			Russia	—	—

Of the 20 countries currently in the CAP study, 17 have completed their data collection and are included in the international data file. As it would be too confusing at this point to compare all of these countries, we will select two that are relatively low in average productivity (the U.S. and Australia), two that are intermediate (Japan and Hong Kong), and one that is high (Korea).

Accounting for individual productivity

The research literature suggests a variety of factors that are thought to be associated with individual productivity as highlighted in Table 2. The empirical evaluation of these factors tends to come from analytical studies of particular "national" systems. The CAP data set allows an additional "hierarchical" level of comparison, that is, the comparison between nations.

Model. There are different ways to introduce the national level into an analysis. Lately it is popular to utilize a hierarchical model. A longstanding alternative is the simple direct comparison of national regressions. We have elected the latter approach, at least for this stage of the analysis, as we think it allows a more explicit comparison of key factors. Also, it is more understandable for a general audience.

Dependent variable. For the dependent variable in the analysis, we transformed the reported number of articles over the past three years to the natural log of total articles plus one. This procedure was selected to approximate to a more normal distribution of publications for each national sample.

Independent variables and data. For the independent variables, drawing on the research literature (especially the U.S. literature) we selected the variables highlighted in Table 2. For many of these variables, there are inconsistencies in the literature which we seek to highlight in Table 2. For example, some studies suggest that productivity declines with increasing age while others suggest the opposite. Some suggest females are less productive than their male counterparts while others find no difference.

It is possible to create a table with each variable, our indicator, and a brief summary of findings from the literature (Table 2).

Table 2. Presumed direction of impact of the selected independent variables

	Concept	CAP Variable No.	Carnegie Variable No.	Presumed Direction of Impact	Argument	Sources
Personal						
	Female	F1	1	?		
	Foreign Born	F9_B_1		F		
	Professor	Academic Rank	9	F		
	Tenured	A11	11b	F		
	FullTime	A7a	11a	F		
	Average Age	2007-F2	2			
Motivation						
	ResInclined	B2	40	F		
	TeReComp	B5_7		F		
	ResOriginal	B5_1		F		
Support						
	ResFunds	B3_12		F		
	ResEquip	B3_4	24d	F		
	ResLabs	B3_3	24c	F		
Effort						
	Research Hrs/Normal Wk	B1_2	18	F		
Connections						
	CollabInt	D1_4	65a	F		
	CollabDom		44	F		
	PublishFor	D5_4	64a	F		
Policies						
	Commercial Res	D2_3		F		
	RestrictPub	D6_1		U		
	RestrictPri	D6_2		U		
	Res Stressed	E6_5		F		

Summary statistics. Table 3 presents the distributions (or for the case of age and research hours *per* week, the averages) for the selected countries. Table 4 compares these statistics in terms of relative national rank, with a low ranking representing a value favorable to research productivity and a high value an unfavorable ranking. What stands out is the predominance of unfavorable rankings for the U.S.

Comparing the regression coefficients. The variables in Table 3 were entered into a multiple linear regression, and the beta coefficients are reported in Table 5. Overall the model provides a good fit for the five selected nations. The adjusted values of r^2 in all cases are above 20% which is respectable for an analysis of this kind, and in three instances the value for r^2 is close to or above 40%.

Table 3. Proportion (%) who have the listed attribute

		US	Japan	Korea	HK	Australia
Personal						
	Female	36.7	5.3	18.1	28.8	49.6
	Foreign Born	20.4	2	0.2	33.8	37.5
	Professor	66.9	85.3	64.8	49	24.2
	Tenured	60.1	71.2	5	36.6	48.9
	FullTime	94.3	99.4	100	93.5	96.6
	Average Age (years)	52	51.8	45.5	45.9	47.3
Motivation						
	Res Inclined	47.6	73.6	69.1	64.6	58.1
	Te Res Comp	66	27.8	65.4	51.5	41.1
	Res Original	68.1	75.1	74.4	81	53.7
Support						
	Res Funds	16.9	18.9	14.9	25.7	18.8
	Res Equip	30.6	32.1	25.4	47	28.8
	Res Labs	28.4	25.3	25.9	40.7	25.6
Effort						
	Research hrs/normal week	13.6	17.1	18.3	16.3	14.1
Connections						
	Collab Int	32.7	25.4	34.6	56.9	44.1
	Collab Dom	57.1	53.3	69.4	52.4	49.3
	Publish Foreign	22.5	35.2	60	69.7	39.8
Policies						
	Commercial Res	14.1	24.2	24.5	10.4	12.8
	Restrict Pub	7	30.7	45.8	13.6	10.8
	Restric Pri	7	19.6	28.8	8.4	9.9
	Res Stressed	44	56.7	32.9	63.9	34.5

Table 4. Rank order of factors favorable for publishing research articles in five countries

		US	Japan	Korea	HK	Australia
Personal						
	Female	4	1	2	3	5
	Foreign Born	3	4	5	2	1
	Professor	2	1	3	4	5
	Tenured	2	1	5	4	3
	FullTime	3	2	1	4	5
	Average Age	5	4	1	2	3
Motivation						
	Res Inclined	5	1	2	3	4
	Teach Res Comp	1	5	2	3	4
	Res Original	4	2	3	1	5
Support						
	Res Funds	4	2	1	5	3
	Res Equip	3	2	1	5	4
	Res Labs	2	5	3	1	4
Effort						
	Research Hrs/Normal Wk	5	2	1	3	4
Connections						
	Collab Int	4	5	1	3	2
	Collab Dom	2	3	1	4	5
	Publish Foreign	5	4	1	3	4
Policies						
	Commercial Res	3	2	1	5	4
	Restrict Pub	1	4	5	3	2
	Restrict Pri	1	5	4	3	2
	Res Stressed	3	2	5	1	4
Number of 1st & 2nd rankings		3..4	4..7	9..3	3..2	1..2

Table 5. Regression summary

Model Summary-US			Model Summary-Japan Summary-US		Model Summary--Korea Summary-Japan		Model Summary--Hong Kong Summary--Korea		Summary--Hong Kong	
Model	Adjusted R^2		Adjusted R^2		Adjusted R^2		Adjusted R^2		Adjusted R^2	
1	0.3595		0.273222		0.205698		0.363217		0.441384	
	Standardized Coeff Beta	Sig. Std. Error	Standardized Coeff Beta	Sig. Std. Error	Standardized Coeff Beta	Sig. Std. Error	Standardized Coeff Beta	Sig. Std. Error	Standardized Coeff Beta	Sig. Std. Error
(Constant)		0.65		0.03		0.00		0.08		0.14
Age_07	-0.03	0.45	0.04	0.24	-0.06	0.30	-0.05	0.33	-0.07	0.05
Research (B)	**0.16**	0.00	**0.07**	0.02	0.03	0.49	**0.09**	0.05	**0.24**	0.00
Female	-0.01	0.86	-0.06	0.06	-0.05	0.21	**-0.10**	0.02	0.03	0.46
ForBorn	-0.04	0.22	-0.01	0.72	-0.04	0.30	-0.05	0.23	-0.04	0.21
ResInclined	**0.24**	0.00	0.12	0.00	**0.13**	0.00	**0.14**	0.00	**0.09**	0.02
TeReComp	0.02	0.65	-0.01	0.64	-0.01	0.90	-0.07	0.14	0.00	0.96
ResOriginal	0.04	0.26	0.01	0.62	-0.03	0.44	0.01	0.81	0.06	0.07
University	**0.09**	0.01							**0.09**	0.01
ResStressed	0.06	0.10	0.00	0.93	0.05	0.26	-0.07	0.14	-0.02	0.53
ResFunds	-0.02	0.49	0.02	0.61	**0.10**	0.02	**-0.11**	0.02	-0.02	0.58
ResEquip	0.02	0.64	0.06	0.12	0.12	0.07	0.04	0.39	0.04	0.34
ResLabs	0.01	0.74	-0.01	0.69	-0.08	0.23	-0.01	0.85	-0.03	0.41
Professor	**0.14**	0.01	**0.12**	0.00	0.04	0.47	**0.24**	0.00	**0.25**	0.00
Tenured	0.02	0.75	**-0.09**	0.01	0.01	0.87	**0.15**	0.01	0.18	0.00
FullTime	0.01	0.67	-0.03	0.37			0.00	0.99	**0.07**	0.04
CommercialR	-0.03	0.40	**0.08**	0.01	0.07	0.09	0.07	0.09	0.03	0.34
RestrictPub	0.01	0.73	0.05	0.11	0.02	0.68	0.00	0.98	-0.03	0.44
RestrictPri	-0.01	0.89	0.03	0.38	0.01	0.85	0.02	0.74	0.06	0.10
CollabInt	**0.11**	0.01	**0.14**	0.00	**0.10**	0.02	**0.17**	0.00	**0.16**	0.00
CollabDom	**0.11**	0.00	**0.15**	0.00	**0.22**	0.00	**0.10**	0.04	**0.13**	0.00
PublishFor	**0.12**	0.00	**0.26**	0.00	**0.20**	0.00	**0.22**	0.00	**0.15**	0.00

It is notable that, regardless of the society, the same sets of variables tend to be significant.

This pattern is perhaps better illustrated in Table 6 which highlights those variables that make a significant contribution at the .01 level (indicated by two ++'s) and at the .05 level (one +); the sign indicates whether the direction of the relation is positive or negative.

Table 6. Variables that have statistically significant contributions in predicting article productivity of STEM academics

	US	Japan	Korea	Hong Kong	Australia
R-Squared	0.36	0.27	0.21	0.36	0.44
Age_07					−
Research Hrs/Wk	++	++		++	++
Female		−		−−	
Foreign Born					
Res Inclined	++		++	++	++
Teach-Res Comp					
Res Original					+
University	++				++
Res Stressed	+				
Res Funds			++	−−	
Res Equip			+		
Res Labs					
Professor	++	++		++	++
Tenured		−−		++	++
FullTime					
Commercial Res		++		+	
Restrict Public					
Restrict Private					+
Collaborate Int	++	++	++	++	++
Collaborate Dom	++	++	++	++	++
Publish Foreign	++	++	++	++	++

In sum, the preference for research over teaching, the number of hours devoted to research, the tendency to engage in both domestic and international collaboration in research work, and the practice of publishing in international journals are the most important factors in accounting for differential research productivity across the five countries. An increased score on any or all of these is a means towards increasing average individual research productivity.

Looking backwards

With the above model in mind, what can be said about recent trends in average productivity? The 1992 Carnegie survey posed the identical question about the number of research articles published over the past years as did the CAP survey. Table 7 adds the 1992 figures to those presented in Table 1 for 2007. In most of the countries for which data is available for the two periods, the averages are up, but for the U.S. they are down.

Table 7. STEM articles, country averages

Country	Article Average 92	Article Average 2007	Direction	% None 92	% None 2007	Direction
USA	6.59	4.95	D	8.4	26.2	U
UK	5.18	6.88	U	27.8	10.9	D
Germany	4.82	9.3	U	29.9	13.4	D
Australia	4.87	7.25	U	26.2	11.4	D
Japan	8.51	9.71	U	11.9	11.3	D
Korea	6.94	11.59	U	7	1.9	D
Hong Kong	5.01	10.6	U	23.8	7.1	D
Russia	3.46			24.1		
Brazil	2.37	4.74	U	52	21.4	D
Mexico	1.66	3.16	U	62.6	40.7	D
Argentina		4.31			26.6	
China		9.2			15.8	
Canada		6.6			10.9	
Malaysia		4.77			29.3	
Portugal		5.64			19.3	
Finland		5.5			21.1	
Italy		8.8			6.2	
Norway		5.22			18	
S. Africa		3.02			28.5	

What accounts for the downward trend in the U.S. and the positive trend in several of the other countries? Again, for several of the independent variables shown to be related to individual productivity, there are identical measurements for both 1992 and 2007. Tables 8a, 8b and 8c compare the summary statistics for these variables for our five countries, first in terms of actual magnitude for the two time periods and then in terms of the changes in this magnitude from

1992 to 2007. For example, an increase in the proportion of academics who say they are inclined to do research is considered a change favorable to research productivity. Similarly an increase in the average weekly number of hours devoted to research is considered a favorable change.

Table 8a. Percentage (or average) of respondents showing the listed attribute in 2007

		US	Japan	Korea	HK	Australia
Motivation						
	Res Inclined	47.6	73.6	69.1	64.6	58.1
Support						
	Res Equip	30.6	32.1	25.4	47	28.8
	Res Labs	28.4	25.3	25.9	40.7	25.6
Effort						
	Research Hrs/Normal Wk	13.6	17.1	18.3	16.3	14.1

Table 8b. Percentage (or average) of respondents showing the listed attribute in 1992

		US	Japan	Korea	HK	Australia
Motivation						
	Res Inclined	58.4	78.9	66.4	66	55.1
Support						
	Res Equip	58.8	12.9	10	50.7	32
	Res Labs	57.9	11.8	9.7	55	35.7
Effort						
	Research Hrs/Normal Wk	18.5	22	17.6	14.9	14.7

Table8c. Direction of change, favorable (F) or unfavorable (U) to increased research productivity, 1992-2007

		US	Japan	Korea	HK	Australia
Motivation						
	Res Inclined	U	U	F	N	F
Support						
	Res Equip	U	F	F	N	N
	Res Labs	U	F	F	U	U
Effort						
	Research Hrs/Normal Wk	U	U	F	F	U

* Where difference is less than 5%, change considered neutral

For all of the listed attributes for which data is available for the two time periods, the values for the U.S. are down in 2007 relative to 1992. In contrast, all of the values are either up or neutral in the case of Korea; and in the three other countries there is a mixed pattern.

Conclusion

It would appear that over the past 15 years that there have been some important shifts in the attractiveness of research environments and in research productivity. The environment is lower in the U.S. as is average research productivity. In contrast the environment has considerably improved in Korea as has productivity. The three other countries covered in our analysis lie in between. Our analysis does not catch all facets of this change. For example, the government of the Republic of Korea has placed a high priority on promoting academic productivity and has significantly increased the resources available for academic research; in contrast, conditions facilitating research have experienced little improvement in the U.S. Again, promotion and tenure procedures have become much more rigorous in Korea whereas they have possibly relaxed in the U.S. A major finding of our analysis is the importance of collaborative relations for stimulating research productivity. Clearly collaboration, both domestic and international, is receiving much emphasis in Korea and the other Asian systems whereas collaboration, at least of the international variety, has not received as much emphasis in the U.S.; this difference is one of several where the U.S. academy does not seem to be transforming itself with the same pace as its Asian neighbors. Insofar as research productivity is an important priority of national policy, this study suggests the importance of reviewing current practice, particularly in the U.S.

Teaching and Research in Germany: narrowing the gaps between institutional types and staff categories?

Ulrich Teichler*

1. The varying functions of academics

The Humboldtian "idea" of the university, among others, praises a close link between teaching and research. It is based on the beliefs that teaching is more creative and qualitatively more demanding, if the teachers are concurrently involved in research, and that research benefits if the scholars are involved in teaching. This belief in the virtue of a close link between teaching and research formulated by Wilhelm von Humboldt was not only essential for the foundation of the University of Berlin in 1810, but it spread subsequently all over the world. For example, the European University Association only accepts institutions of higher education as members that are characterized by a close link between teaching and research. The concept of the "research university" in the U.S. is based on a similar link, even though the Humboldtian idea was taken up primarily as a concept suitable for graduate education; it has had an enormous influence as a role model all over the world.

One has to note, however, that a close link between teaching and research does not apply equally to the higher education and research system as a whole, to all institutions of higher education, and to all academic staff categories; in those respects, we observe differences by country. The academic profession is divided in many respects: The striking disciplinary "tribes" vary as far as theories, methods and "culture" are concerned. While some institutions hold a close link between teaching and research in high esteem, other institutions are almost exclusively responsible for teaching; moreover, types of higher education

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institute might not only differ as regards the relationships between teaching and research, but also in their conceptual thrust: often, institutions responsible for both teaching and research consider themselves theoretically oriented, while those solely or predominantly responsible for teaching see their strength in the application of knowledge. Moreover, junior academic staff and senior academics in many countries seem to have little in common with respect to job security, composition of tasks and influence in academia. Last but not least the current popularity of "rankings" of "world-class universities" suggests that the identity of academics ought not to be primarily based on the academic profession as a whole or on the respective disciplines, but rather on the individual institution similarly to the often named "company spirit" of Japanese companies in the "golden age" of life-time employment for a few decades after World War II. These varied divides challenge the assumption that "the" academic profession (*i.e.* a single academic profession) really exists.

The project "The Changing Academic Professions" (CAP) does not address the characters of individual academic disciplines; if this had been the case, specific questions would have been asked about the perception of the character of individual disciplines. The CAP project also does not address the possibly emerging divides between individual institutions of higher education (apart from the question of whether the respondents feel affiliated to their discipline, their department and their institution). But the CAP project provides ample opportunities to analyse the extent to which senior and junior staff are segmented or have elements in common, as well as how far academics at universities with a close link between teaching and research differ from those at other institutions of higher education.

Actually, Germany is an interesting case in this respect, because it is a country where – according to the available literature – the scholars' involvement in teaching *versus* research varies substantially by institutional type and by staff category (see Teichler & Bracht, 2006; Teichler, 2007; Teichler, 2008; *cf.* also Kehm, 1999; Simon, Knie & Hornbostel, 2010). The Humboldtian concept of the virtue of a close link between teaching and research applies closely even today most clearly to the work tasks of university professors: they have a teaching load of 8-9 hours *per* week during the lecture period; this is based on the assumption that the overall time available during a year on teaching and teaching-related activities is more or less equal to that available for research and research-related activities. The teaching load is almost uniform for German university professors. The regulations set by the individual *Länder* vary only between 8 and 9 hours. The number of actual teaching hours might be

moderately reduced if the professor has to take care of large numbers of students, and only few professors get their teaching load reduced for other purposes.

But such an idea of a balance of teaching and research does not apply to other categories of academics in Germany. We have to consider three other categories in this context.

First, junior academic staff at universities in Germany, by far more numerous than university professors, are involved to a lesser extent in teaching. Junior academics, who are paid from the regular university budget, often are expected to teach about half as many weekly hours as university professors; they spend most of their time on research, on the preparation of a dissertation, and eventually of *Habilitation* as a grand piece of research qualifying for a call to a professorial position. A stronger involvement of junior academic staff in research than in teaching is viewed as essential in Germany in order to prepare for a proper link between teaching and research on the part of the professors. In addition, many young academics at German universities are employed on the basis of external research grants, *i.e.* exclusively for undertaking research; however, they might offer individual courses if they wish to do so and if their supervisors do not disagree.

Second, when a substantial expansion of enrolment was accepted in the 1960s as desirable or inevitable, most actors and experts in Germany agreed that the close link between teaching and research as customary at universities could not be preserved for the higher education system as a whole. From 1970 onwards, *Fachhochschulen* were established as a second institutional type primarily through the upgrading of former engineering colleges and higher vocational training schools. At the these institutions, calling themselves "universities of applied sciences" in the English language since the early 1990s, professors are expected to teach 18 hours *per* week even over a slightly longer lecture period than that at universities. Professors of these institutions have only an optional research role, and they might get only a small reduction of their teaching load if they are highly active in research. It should be added here that the number of junior staff at universities of applied sciences is very small, because these institutions do not educate their future professors themselves; rather, in order to be appointed as a professor at a *Fachhochschulen*, a person has to have acquired a doctoral degree at a university and has to have been professionally active for at least five years after the award of a doctoral degree, of which three of the years should have been outside academia in a professional area close to his or her future teaching. Moreover, the infrastructure of *Fachhochschulen* for research activities is quite weak as compared to that at

universities.

The importance of these differences can be illustrated further by the following facts. There is no common word for the "academic profession" in the German language at all. Rather, academics are divided into occupational categories: "*Hochschullehrer*" and "*wissenschaftliche Mitarbeiter*". Moreover, there are distinct titles of "university professors" and "professors" (*i.e.* those at other institutions of higher education). Finally, there are separate membership organisations for university professors (*Hochschulverband*) and for professors at *Fachhochschulen* (*Hochschullehrerbund*), neither of them accepting junior staff as members.

Third, there is a broad range of public research institutes in Germany exclusively devoted to research. The institutes, under the umbrella of four associations – Max Planck, Leibnitz, Fraunhofer and Helmholtz associations, vary in their emphasis on basic or applied research, and in typical size as well as in the disciplinary dominance. Most persons in the director rank at these institutes are appointed also as special-status professors at a university nearby. In these cases, the salary is paid by the research institute, the professor has a relatively small teaching obligation but he or she can make sure that the doctoral candidates of his or her research institute are accepted on terms equal to those of the university, and he or she might form groups of doctoral candidates and young researchers across the institutional divide. The junior staff of the research institutes, like those at universities paid by external research grants, might teach voluntarily individual courses at a university.

In sum, the ideal of a close link between teaching and research is held in high esteem in Germany. In reality, however, it is only a small minority of about 15% of all academics in the higher education and public research system who are expected to have a real balance between these two functions. Others are predominantly researchers or predominantly teachers whereby the respective alternative function might be mandatory, on a smaller scale, or even only voluntary.

The comparative research project "The Changing Academic Profession" (CAP) provides, first, the opportunity of examining the extent to which senior and junior academics as well as academics at universities and those at other institutions of higher education have much in common or are clearly different and of exploring the extent to which academics in Germany differ from those in other countries in those respects. Second, a comparison between the findings of the Carnegie Study on the Academic Profession undertaken in 1992 and those of the CAP undertaken in 2007, makes it possible to measure the extent of

change that occurred within more than a decade as long as the questions posed were identical or had a similar form.

One could assume, for example, that the differences between academics at universities and those at other higher education institutions become smaller as a consequence of an "academic drift" on the one hand, *i.e.* a tendency of the less prestigious institutions to copy the character of the more prestigious ones, or as a consequence of increasing pressures exerted on the universities to provide more visibly useful results. Similarly, one could assume that the frequently advocated policies of reducing long periods of uncertainty and dependency of junior advocated staff have succeeded in reducing the divide between junior and senior academics. *Quod esset demonstrandum*.

The subsequent analysis takes into consideration the German case in comparison to eight other advanced countries participating in the CAP study: Finland, Norway, Italy, Portugal, the United Kingdom, Japan, the U.S., and Australia. The comparison between 1992 and 2007, however, can refer only to the four other countries participating in both surveys: the United Kingdom, Japan, the U.S., and Australia. The analysis is based on the CAP data-set of August 2009.

2. The findings of the Carnegie study

The comparative study on the academic profession, undertaken in 1992 on the initiative of the Carnegie Foundation for the Advancement of Teaching, provided information for the first time that has allowed us to examine whether the respective teaching and research functions according to institutional type and staff categories in Germany has changed similarly to other countries or has been unique to Germany. Unfortunately, however, the major publications of the Carnegie Foundation's study in two volumes (Boyer, Altbach & Whitelaw, 1994; Altbach, 1996) as well as most country reports have addressed only the totality of academics in the respective countries, thereby not paying attention to eventual variations by institutional and staff categories. In contrast the report on the German academic profession in comparative perspective divided the respondents into three categories: (a) university professors, (b) junior staff at universities, and (c) academics at other institutions of higher education (Enders & Teichler, 1995a; 1995b). As more than 90% of the academics at German universities of applied sciences surveyed in 1992 were professors, the responses of all academics at those institutions in 1992 can be compared only to those of the professors at universities of applied sciences in 2007.

It should be noted that the 1992 survey did not include academics at public research institutes outside higher education. In 2007, they were included in some countries, among them in Germany. However, they are not taken into consideration in the following analysis, because change over time cannot be analyzed with respect to this category of academics.

In looking at the relevant results of the 1992 survey, let us first address the distribution of working time according to teaching and research (*cf.* Teichler, 2009).

- University professors in Germany surveyed in 1992 spent a higher proportion of their time during the lecture period on teaching than their colleagues in the other four countries: 43% as compared to between 28% (Japan) and 37% (the Netherlands). However, taking the time budget outside the lecture period into consideration, we note that German university professors spent altogether slightly more time on research than on teaching and thus have been very close to the ideal of a balance of time spent on teaching and research.
- In contrast, junior academic staff at universities in Germany spent, together with their Japanese colleagues, less time on teaching than their colleagues in other countries: 26% as compared to between 38% (United Kingdom) and 47% (Australia).
- Finally, academics at other types of higher education institutions in Germany (at *Fachhochschulen*) spent substantially more time on teaching than their colleagues in other countries: 69% as compared to between 42% (Japan) and 56% (U.S.).

As regards working time, thus, German academics were more strongly polarized in 1992 according to institutional and staff category than academics in other advanced countries.

Second, academics' preferences for teaching and research are noteworthy.

- In most countries included here, we have noted a stronger leaning towards research or a clear preference of research on the part of university professors. In Germany, however, a preference for research was expressed in 1992 by only 66% of the university professors, *i.e.* after the U.S. (58%) the second lowest proportion compared to between 70% (Australia) and 91% (Japan). The idea of a balance between teaching and research, thus, had been abandoned in Germany to a lesser extent in favour of research than in many other countries.

- Junior staff at universities in most countries analyzed had a slightly higher preference for research than senior academics. Otherwise, the differences by country were small except for a stronger emphasis on teaching on the part of the U.S. respondents.
- Finally, academics at other institutions of higher education in Germany were only in third place in expressing preference for teaching (lower than in the Netherlands and Australia).

Thus, the polarization of the German academics in the three categories addressed according to their official functions and according the time spent on teaching and research affected their preferences for teaching or research to a lesser extent than one might have expected.

Third, the findings as regards overall job satisfaction are interesting with regard to Germany.

- High job satisfaction was widespread in 1992 among university professors (2.3 on average on a five-point scale) and to a slightly lesser extent among academics at other institutions of higher education (2.6). In both cases, the respondents from Germany were close to the average across all countries.
- Junior academic staff at German universities were clearly less satisfied with their job (3.1) than their colleagues in other countries (between 2.6 and 2.8).

Table 1. Assessment of the infrastructure for academic work, academics in advanced countries 1992 and 2007 (arithmetic mean)*

	DE	FI	NO	IT	PT	UK	AU	JP	US
University professors 2007	2.6	2.3	2.5	2.8	2.6	2.8	2.5	2.9	2.5
(University professors 1992)	(2.6)	.	.	.	.	(2.7)	(2.7)	(3.2)	(2.4)
Junior academic staff at universities 2007	2.6	2.2	2.4	3.0	2.9	2.8	2.6	3.0	2.5
(Junior academic staff at univ. 1992)	(2.6)	.	.	.	.	(2.8)	(2.7)	(3.2)	(2.7)
Professors at other HEIs 2007	2.7	2.3	2.6	.	2.7	3.0	2.6	.	2.4
Junior acad. staff at other HEIs 2007	2.5	2.4	2.4	.	2.9	3.1	2.8	.	2.6
(Academics at other HEIs 1992)	(2.9)	.	.	.	.	(3.1)	(2.9)	(3.2)	(2.7)

* On a scale from 1 = "Excellent" to 5 = "Poor", average of eight items: Classroom, technology for teaching, laboratories, research equipment and instruments, computer facilities, library facilities, your office space, and secretarial support.

The authors of the German study have pointed out that the working conditions – rated identically on average by university professors and junior academic staff in Germany (see Table 1) – and the employment conditions (though the German junior staff frequently suffer part-time and short-term

employment) could not explain completely the relatively low degree of job satisfaction of the junior academic staff at German universities. They came to the conclusion that the status gap and the degree of dependency of the junior academics as regards their senior supervisors might have caused dissatisfaction.

3. Changes visible in 2007

The polarized settings of the different categories of academics in Germany have not been static during the recent decades. Among others, those responsible for public research institutes got interested in strengthening cooperation with universities notably in doctoral training. Efforts were made as well to get junior staff in universities better trained for future teaching assignments, among others through increased teaching responsibilities already in their junior careers. Moreover, activities were undertaken to strengthen the role of junior academics in various respects, for example through increased opportunities for raising research funds and coordinating research on their own. Finally, various measures were taken to increase the role of *Fachhochschulen* in the area of research.

The findings of the comparative study "The Changing Academic Profession" (CAP), undertaken in 2007 (or in some countries somewhat later), show some signs toward narrowing of this gap. This can be illustrated by a comparison of the responses to the three questions addressed above, which were repeated identically in 2007 (*cf.* Jacob & Teichler, 2009).

As regards the distribution of working time, Table 2, in fact, shows a reduction of differences between the three categories of respondents.

- University professors in Germany spent substantially less time on teaching in 2007 than in 1992. While they had spent more time on teaching in 1992 than in the other four advanced countries, they spent less on teaching in 2007 than in all of these countries except Australia. The time on teaching on the part of university professors in Germany was not moved towards research, but rather to service and other academic activities.
- Junior staff at universities in Germany hardly changed the proportion of time spent on teaching and research. Again, junior academics spent more time on research than those of the other four countries (however, junior academic staff from Finland and Norway, not represented in the 1992 study, spent even a higher proportion of their working time on research).
- Professors at other institutions of higher education in Germany spent about

8% less of their time on teaching in 2007 than in 1992; correspondingly, they increased the proportion of time spent on research by about 5%. However, the proportion of time they spent on teaching remained the highest in comparison to other advanced countries.

Table 2. Proportion of time spent on different activities, academics in Germany 1992 and 2007 (percentages)

	At universities				At other HEIs	
	Junior staff		Professors		Acad.	Prof.
	1992	2007	1992	2007	1992	2007
When classes are in session						
Teaching	26	28	43	34	69	57
Research	49	43	29	31	12	19
Service	14	18	8	11	6	7
Other academic activities	2	6	5	8	2	5
Administration	6	9	16	16	12	12
Total	100	101	101	100	101	100
When classes are not in session						
Teaching	12	13	20	16	44	29
Research	61	57	53	50	33	39
Service	15	18	9	12	11	12
Other academic activities	3	7	7	10	4	8
Administration	8	6	12	12	9	13
Total	99	110	101	100	101	101

Thus, altogether, the differences in the proportion of time spent on teaching and on research respectively by these three categories of academics declined somewhat. However, they remained higher than in the other four advanced countries.

As regards preferences for teaching or for research, we note that university professors in Germany moved slightly towards a higher emphasis on research while junior staff moved slightly towards a stronger emphasis on teaching (see Table 3). Thus, the differences of preferences between these two categories became smaller. Surprisingly, however, professors of other institutions of higher education in Germany moved in their preferences somewhat in the direction of a stronger emphasis on teaching, even though their time budget, in reverse, shifted somewhat from teaching towards research. Altogether, the German respondents of these three categories did not change substantially as compared to the other countries for which information is available for both 1992 and 2007.

Table 3. Preferences in teaching and research, academics in Germany 1992 and 2007 (percentages)

	At universities				At other HEIs	
	Junior staff		Professors		Acad.	Prof.
	1992	2007	1992	2007	1992	2007
Primarily in teaching	6	9	5	2	29	42
In both, but leaning towards teaching	22	2	30	20	49	35
In both, but leaning towards research	46	42	58	66	22	21
Primarily in research	26	27	7	12	0	2
Total	100	100	100	100	100	100

Table 4. Overall professional satisfaction of academics in advanced countries 1992 and 2007 (arithmetic mean)*

	DE	FI	NO	IT	PT	UK	AU	JP	US
University professors 2007	2.2	2.2	2.2	2.1	2.3	2.6	2.2	2.3	2.3
(University professors 1992)	(2.4)	.	.	.	.	(2.5)	(2.3)	(2.4)	(2.3)
Junior academic staff at univ. 2007	2.5	2.3	2.3	2.4	2.6	2.8	2.6	2.5	2.3
(Junior academic staff at univ. 1992)	(3.1)	.	.	.	.	(2.8)	(2.8)	(2.5)	(2.7)
Professors at other HEIs 2007	2.3	2.2	2.3	.	2.4	2.8	2.2	.	2.2
Junior acad, staff at other HEIs 2007	2.7	2.3	2.3	.	2.9	2.8	2.8	.	2.3
(Academics at other HEIs 1992)	(2.7)	.	.	.	.	(2.5)	(2.3)	(2.4)	(2.3)

* On a scale from 1 = "Very satisfied" to 5 = "Very dissatisfied"

Finally, as regards job satisfaction, we note that professors in German universities are slightly more satisfied in 2007 that their predecessors were in 1992 (+0.2), and that professors at Fachhochschulen are substantially more satisfied (+0.4). One of the most striking changes from 1992 and 2007, can be observed with regards to the overall satisfaction of junior staff at German universities: They are strikingly more satisfied in 2007 (2.5) than in 1992 (3.1); while they were least satisfied in 1992 among their colleagues from other countries, they are close to the average in 2007. In sum, the job satisfaction of German academics increased visibly over the years, while respective changes in the other countries were small on average. Accordingly, the differences between the different categories of respondents from Germany declined substantially.

Altogether, the differences in Germany between senior and junior academics as well as the differences between academics at universities and those at other institutions of higher education seem to have become smaller. As regards the time spent on teaching and on research, however, they still remained larger than the corresponding times in the advanced countries participating in both comparative surveys.

4. Selected aspects of teaching

The CAP study aimed to establish the diversity of activities undertaken by academics. In 2007, they posed a list of seven teaching activities other than the usual classroom instruction: individualized instruction, learning in projects / project groups, practice instruction / laboratory work, ICT-based learning / computer-assisted learning, distance education, face-to-face interaction with students outside of class, and electronic communication with students. As Table 5 shows, German academics clearly are least involved in these varied teaching activities, followed by Japanese academics. In contrast, a broad range of teaching activities is customary in Finland, the United Kingdom, Australia and the U.S.

Table 5. Involvement in varied teaching activities, academics in advanced countries 2007 (arithmetic mean)*

	DE	FI	NO	IT	PT	UK	AU	JP	US
University professors	2.6	4.3	4.0	3.8	3.2	4.5	4.0	3.3	4.0
Junior academic staff at universities	2.0	3.6	3.3	3.7	3.6	4.0	4.2	2.9	3.9
Professors at other HEIs	3.2	5.1	3.8	.	3.4	4.8	4.1	.	4.2
Junior academic staff at other HEIs	2.6	4.8	3.0	.	3.6	4.0	4.6	.	4.3

* Average number of seven teaching activities named other than regular classroom teaching

Similarly, only a few German and Japanese academics are involved in the development of course material. However, the proportion of German professors at universities and other higher education institutions involved in curriculum / program development is close to the average of advanced countries, while junior staff at German higher education institutions are less involved in these activities than their colleagues from other advanced countries.

In addition, academics were asked to state the extent to which their teaching activities are regulated or exposed to more or less clear expectations. Four themes have been addressed in this context: student numbers in classes and to be supervised as well as success rates and time spent on consultation (a similar question as regards teaching load is not included here because it was not asked in the German questionnaire).

Table 6 shows that Germany belongs to a group of four countries (Germany, Finland, Italy and Japan) where regulations or clear expectations of that kind are relatively rare for university professors; in contrast, they are most frequent in the United Kingdom and Australia. Altogether, those regulations and expectations

apply more often to professors of other higher education institutions, but, again, Germany belongs to those countries where those regulations and expectations are least customary; in contrast, they are most frequent in Australia as well as quite frequent in Portugal and the United Kingdom.

Table 6. Regulations and expectations as regards teaching set by higher education institutions, professors at universities and other higher education institutions in advanced countries 2007 (percentages; multiple responses)

	DE	FI	NO	IT	PT	UK	AU	JP	US
University professors									
Number of students in your classes	42	33	26	37	46	51	51	21	64
Number of grad. students for supervision	19	33	48	13	15	52	63	16	23
Percentage of students passing exams	19	7	14	4	7	29	19	12	6
Time for student consultation	14	25	56	38	53	61	42	40	46
Total	93	97	145	92	120	193	176	89	139
Professors at other HEIs									
Number of students in your classes	57	49	43	.	62	57	62	.	66
Number of grad. students for supervision	31	9	39	.	21	29	62	.	8
Percentage of students passing exams	20	16	28	.	13	19	18	.	4
Time for student consultation	15	52	29	.	68	54	67	.	62
Total	123	126	139	.	164	159	209	.	140

As the final example of information selected in the domain of teaching, Table 7 shows the responses to a list of possible approaches in regard to teaching other than those of emphasising the value of the academic subject matter and the quality of teaching and learning as such. We suggest these approaches can be characterised under five headings.

- *Practice-oriented approach*: "Practically oriented knowledge and skills are emphasized in your teaching";
- *International approach*: "In your courses you emphasize international perspectives or content";
- *Value-oriented approach*: "You incorporate discussions of values and ethics into your course content";
- *Honesty approach*: "You inform students of the implications of cheating or plagiarism in your courses";
- *Meritocratic approach*: "Grades in your courses strictly reflect levels of student achievement".

Obviously, German academics have a strong practice-oriented approach. This is most pronounced at other institutions of higher education where they

adhere to it more closely than academics from other countries, but also at universities, where academics from German and Portuguese universities emphasize a practice-oriented approach most strongly. In addition, university professors in Germany adhere strongly to an international approach, while this is less emphasized by other academics in Germany. Finally, no other approaches are high on agenda of academics in Germany.

Table 7. Teaching approaches, academics in advanced countries 2007 (percentage*)

	DE	FI	NO	IT	PT	UK	AU	JP	US
University professors									
Practice-oriented approach	75	31	49	54	75	69	65	52	68
International approach	79	63	69	62	90	66	75	56	51
Value-oriented approach	57	53	45	40	71	69	67	50	67
Honesty approach	53	41	36	32	78	94	82	51	81
Meritocratic approach	72	95	78	79	55	87	87	59	85
Junior academic staff at universities									
Practice-oriented approach	77	48	51	54	77	67	76	58	74
International approach	50	46	60	60	82	60	65	41	46
Value-oriented approach	36	41	36	34	71	70	68	42	66
Honesty approach	41	38	36	28	88	86	82	44	84
Meritocratic approach	59	89	71	81	53	79	78	50	87
Professors at other HEIs									
Practice-oriented approach	93	79	57	.	81	83	81	.	72
International approach	60	52	61	.	68	66	77	.	51
Value-oriented approach	54	53	39	.	73	87	78	.	73
Honesty approach	58	60	41	.	72	97	89	.	89
Meritocratic approach	80	98	80	.	47	79	81	.	87
Junior academic staff at other HEIs									
Practice-oriented approach	99	80	70	.	82	71	78	.	76
International approach	40	45	64	.	75	87	65	.	52
Value-oriented approach	21	57	48	.	62	75	78	.	78
Honesty approach	81	55	60	.	75	93	91	.	82
Meritocratic approach	76	95	52	.	51	89	82	.	86

* Responses 1 and 2 on a scale from 1 = "Strongly agree" to 5 = "Strongly disagree"

5. Selected aspects of research

In describing research at institutions of higher education in Germany in comparative perspective according to the academics' views, we can consider first the institutional environment. In the respective question, respondents were asked to assess the extent to which a fund-raising orientation, a utility orientation

and an interdisciplinarity orientation prevails at their institution. The items were phrased in the questionnaire as follows.

- *Fund-raising orientation*: "The pressure to raise external funds has increased since my first appointment";
- *Utility orientation*: "Your institution emphasizes commercially-oriented or applied research";
- *Interdisciplinarity orientation*: "Interdisciplinary research is emphasized at my institution".

As Table 8 shows, a fund-raising orientation seems to be strong in all countries. The relatively low percentages in the case of the U.S. might be due to the phrasing of the question, *i.e.* to the increase since the respondents' appointment, because the fund-raising orientation seems to have a longer tradition in the U.S. than in the other countries surveyed.

Table 8. Assessment of the research environment at institutions of higher education, academics in advanced countries (percentages*)

	DE	FI	NO	IT	PT	UK	AU	JP	US
University professors									
Fund-raising orientation	94	88	87	81	87	89	95	79	73
Utility orientation	32	39	34	37	45	56	61	29	44
Interdisciplinarity orientation	71	66	48	37	60	68	69	43	64
Junior academic staff at universities									
Fund-raising orientation	78	73	66	71	84	75	82	74	72
Utility orientation	32	38	33	35	39	51	66	20	49
Interdiscplinarity orientation	53	61	51	38	52	68	65	45	56
Professors at other HEIs									
Fund-raising orientation	93	80	86	.	80	69	96	.	51
Utility orientation	71	80	40	.	32	82	60	.	18
Interdiscplinarity orientation	37	75	44	.	34	58	75	.	40
Junior academic staff at other HEIs									
Fund-raising orientation	79	82	81	.	62	79	86	.	56
Utility orientation	76	66	34	.	39	78	58	.	26
Interdiscplinarity orientation	46	63	48	.	30	83	58	.	41

* Responses 1 and 2 on a scale from 1= "Strongly agree" to 5= "Strongly disagree"

A utility orientation is least often reported for universities in Japan. It seems to be below average in most European countries. The strongest emphasis on commercial or applied research at universities seems to prevail in Australia and the United Kingdom, followed by the U.S.

The situation is different at other institutions of higher education. On the

one hand, a high utility orientation is reported for Germany and Finland, where these institutions have a tradition on applied emphasis in contrast to the theoretical emphasis of the universities. On the other hand, a utility orientation is hardly observed with respect to other institutions of higher education in the U.S.

Finally, more than half of the respondents on average state that interdisciplinarity is strongly emphasized at their institution of higher education. This seems to be least emphasized at universities in Italy and Japan as well as at other institutions of higher education in Germany and the U.S. By and large, we note that the perceptions of junior academic staff of each country do not differ substantially from those of the professors of the same institutional type.

Second, the questionnaire survey has addressed the academics' own views on the character of research and scholarship. They were asked to characterize the role they see for research and scholarship as oriented towards original research, as synthesis of findings, as application and as societally relevant. The actual phrasings in the questionnaire are as follows.

- *Original research*: "Scholarship is best defined as the preparation and presentation of findings on original research";
- *Synthesis of findings*: "Scholarship includes the preparation of reports that synthesize the major trends and findings in my field";
- *Application*: "Scholarship includes the application of academic knowledge in real-life settings";
- *Societal relevance*: "Faculty in my discipline have a professional obligation to apply their knowledge to problems in society".

Table 9 shows that scholars at universities on average emphasize original research more strongly, while scholars at other institutions of higher education are more inclined to emphasize application. Thereby, junior academic staff hold similar views to the professors of the same type of higher education institutions.

But Table 9 shows as well that there are no divided worlds between the two types of higher education institutions. They differ gradually with respect to original research and application, and they hardly differ with respect to the appreciation of syntheses of findings or to the societal relevance of academic work. But there are differences by country. Academics in Germany differ in their views as regards original research and application more strongly according type of higher education institutions than academics of the other countries surveyed.

Table 9. Views regarding research and scholarship, academics in advanced countries 2007 (percentages*)

	DE	FI	NO	IT	PT	UK	AU	JP	US
University professors									
Original research	83	68	92	73	81	68	76	78	74
Synthesis of findings	61	69	56	45	59	68	71	81	72
Application	62	74	59	57	77	69	67	76	81
Societal relevance	61	65	50	62	73	58	67	65	63
Junior academic staff at universities									
Original research	69	61	86	74	74	66	69	72	61
Synthesis of findings	67	59	61	49	62	63	65	77	64
Application	67	84	65	64	76	65	75	77	76
Societal relevance	44	58	51	61	73	59	60	75	68
Professors at other HEIs									
Original research	56	54	88	.	80	57	68	.	57
Synthesis of findings	72	75	68	.	57	59	67	.	71
Application	87	92	56	.	88	83	67	.	83
Societal relevance	63	78	56	.	66	73	71	.	67
Junior academic staff at other HEIs									
Original research	49	35	81	.	64	44	59	.	62
Synthesis of findings	83	54	63	.	47	60	68	.	67
Application	84	91	70	.	80	55	78	.	80
Societal relevance	75	64	74	.	68	75	70	.	66

* Responses 1 and 2 on a scale from 1= "Strongly agree" to 5= "Strongly disagree"

Finally, information ought to be provided here about the results of research work. The academics surveyed in this study were asked to give the numbers of publications of various types completed in the past three years.

University professors on average in the advanced countries surveyed in 2007 report that they have been responsible or have contributed with others to

- 0.9 books,
- the editing of 0.6 books,
- 10.1 articles for books and journals,
- 1.9 research reports,
- 7.5 papers at conferences, and
- 1.9 articles for newspapers and magazines.

In Table 10, books are counted as three points, articles in academic journals and books as well as research reports as two points, and finally papers presented at conferences as well as articles written in newspapers and magazines as one point. One might challenge this weighting, and we have to bear in mind that the number of publications reported cannot be classified according to selectivity

or quality. Yet, this might be the best approximation of academic productivity possible in the framework of this study.

Table 10. Number of publications completed in the last three years, academics in advanced countries 1992 and 2007 (arithmetic mean of points)*

	DE	FI	NO	IT	PT	UK	AU	JP	US
University professors 2007	56	38	27	40	44	38	49	35	28
(University professors 1992)	(33)	.	.	.	.	(29)	(39)	(53)	(27)
Junior academic staff at univ. 2007	20	16	12	29	23	15	21	25	18
(Junior academic staff at univ. 1992)	(14)	.	.	.	.	(20)	(16)	(39)	(14)
Professors at other HEIs 2007	19	10	21	.	41	29	32	.	9
Junior acad, staff at other HEIs 2007	9	7	8	.	16	15	16	.	8
(Academics at other HEIs 1992)	(9)	.	.	.	.	(8)	(15)	.	(12)

* 3 points each for scholarly books (co)authored and co(edited); 2 points each for articles published in academic books or journals and research reports, 1 point each for papers presented at conferences and articles written in newspapers/magazines

The average points of German university professors surveyed in 2007 are the highest (55). Also Australian professors report a high number of publications (49). The points range in the other countries from 28 in the U.S. to 44 in Portugal. Junior academics at universities publish about half as much as professors of the same institutional type, whereby the highest number of points is reported by junior staff from Italy (29) as compared to between 12 (Norway) and 25 (Japan), with Germany (20). Professors at other higher education institutions publish approximately as much as junior academic staff at universities; the highest numbers of points are reported by respondents from Portugal (41), while for other countries the scores range from 9 in the U.S. to 29 in the United Kingdom (Germany 19). Finally, junior academic staff at other institutions publish on average about half as much as professors at these institutions as well as junior academic staff at universities, thereby ranging from 7 (Finland) to 16 (Portugal and Australia) with Germany (9).

There have been substantial changes in the quantity of publications between 1992 and 2007. In Germany, the quantity of publications increased substantially; we also note somewhat of a growth in Australia and the United Kingdom. On the other hand, the quantity of publications remained more or less equally low in the U.S., and it declined in Japan from the highest level in 1992 to about average in 2007.

6. Concluding observations

The Carnegie Study on the Academic Profession showed for 1992 that the differences between the categories of academics according to occupational rank and institutional type have been more substantial in Germany than in the other advanced countries surveyed both in 1992 and 2007, notably as regards teaching load and the proportion of the working time spent on teaching *versus* research. However, the German university professors held teaching in 1992 more highly in esteem than one had expected from the image of strongly research-minded German professors and they actually spent substantial time on teaching. The 1992 study also showed that junior and senior academics at universities had much in common in their general academic values as well as in their assessment of the quality of the working conditions. One striking difference in 1992 is worth mentioning though: junior academic staff at German universities were then least satisfied with their jobs.

From 1992 to 2007, we observe a narrowing of the gap between the different categories of academics in Germany in some aspects, but not consistently throughout. For example, differences in the time spent on teaching *versus* research have declined, though remaining higher than in other countries. Also, the preferences stated for teaching and research have become more similar on average for the different staff categories in Germany. Finally, the overall job satisfaction of German academics has increased more strongly than in other countries, whereby the ratings of the various staff categories have become more similar over time.

Looking in general at some of the findings provided here on academics in advanced countries in 2007 we note that German academics are least involved in various teaching activities apart from the usual lecturing. They are less exposed than their colleagues from other countries to standardizing expectations as regards the processes and the outcomes of teaching. In those two respects, there are no major differences of responses by the various staff categories in Germany. With regards to a practice-orientation in teaching, we note a clearly stronger emphasis on the part of German academics at other institutions than German academics at universities, whereby the differences between professors and junior staff are low; however, academics at both types of higher education institutions in Germany are more likely to appreciate practice-oriented teaching and learning than their colleagues at similar types of institutions in most other countries surveyed.

As regards research, it does not come as a surprise to find that an applied

orientation of the higher education institution is more frequently reported by professors from other higher education institutions in Germany than by those from universities. Similarly, academics in the former institutions consider themselves more often responsible for application and less often for original research than academics from universities. In both cases, the differences of responses by senior and junior staff of each of the institutional types are relatively small. However, the gap between the institutional types in these respects is smaller in Germany than in most other countries.

Academic productivity, measured in terms of publications, differs substantially by staff categories. In Germany, university professors publish about twice as much as junior staff at universities and professors at other higher education institutions and about four times as much as junior staff at other higher education institutions. These differences are in some respects bigger than in other countries. It is worth noting that Germany is among the countries with a clear increase of publications from 1992 to 2007, whereby the substantial increase of publications by university professors in Germany, which brings them up to the highest level of the countries analysed in 2007 is the most striking result.

Altogether, we note that the academics' situation and activities in teaching and research differ substantially by country. Germany is the country where such differences between junior and senior staff as well as between those active at universities and Fachhochschulen were most pronounced; the differences became smaller in some respects over the period analysed. But they remained substantial in a comparative perspective. The question remains open: does it make sense to speak of a single academic profession?

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Presentations

Teaching and Research in a Changing Environment: academic work in Italy

Michele Rostan*

1. Introduction

Italian academics display a rather traditional attitude towards the relationship between teaching and research. Most of them are interested in both teaching and research (86%), although a preference leaning towards research is prevalent (64%)[1]. Further, they disagree or strongly disagree with the view that teaching and research are hardly compatible with each other (67%). Interest in both teaching and research is slightly more widespread among full and associated professors (88%) than among researchers/assistant professors (82%), and increases slightly with age (from 82% in the age group of those up to 45 years, to 89% in the age group over 55 years). Taken for granted the interest in both activities, preferences leaning towards research or towards teaching diverge as time goes by: the former decreases as academics get older while the later increases. Disagreement on the incompatibility between teaching and research is stronger among full professors (75%), than among other academics (associate professors, 68%; researchers/assistant professors, 58%) and is less pronounced among younger academics (61%), than among academics of the other age groups (46-55 years, 70%, and 56 or more, 72%).

Italian academics' attitude towards the relationship between teaching and

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[1] Italian academics' time budget is consistent with their preferences. When classes are in session, 41% of their time is dedicated to teaching and 37% to research. When classes are not in session, time for research increases to 59%, while time for teaching activities decreases to 18%. Time dedicated to other activities (administration, service, other academic activities) is fairly stable ranging from 22% to 23%.

research makes them quite different from their colleagues of other European countries (Tables 1.1 and 1.2). They are much more interested in both teaching and research than those elsewhere, the percentage of academics interested in both teaching and research − but with a preference leaning towards research − is higher in Italy, and Italian academics, together with their Norwegian colleagues, express stronger disagreement with regards to the incompatibility between teaching and research.

Table 1.1 Academics preferences in teaching and research by country (%)

	FI	DE	IT	NO	UK	Total
Primarily in teaching	7	8	2	2	9	5
In both, but leaning towards teaching	14	22	22	16	23	19
In both, but leaning towards research	43	41	64	51	41	50
Primarily in research	36	29	12	31	27	25
(N = 5400)						

CAP survey B2: Regarding your own preferences, do your interests lie primarily in teaching or in research?

Table 1.2 Views on the relationship between teaching and research by country (%)

	FI	DE	IT	NO	UK	Total
Academics who disagree or strongly disagree with the view that teaching and research are hardly compatible with each other	34	43	67	64	57	54
(N = 5313)						

CAP survey B5: Please indicate your views on the following (Scale of answer 1 = Strongly agree to 5 = Strongly disagree; only answers 4 and 5)

This evidence collected through the CAP international survey suggests that Italian academics, especially professors and older academics, more than those in other countries still endorse the Humboldtian tradition of a strict link between teaching and research ("*Einheit von Forschung und Lehre*"), possibly as a result of an institutional environment, and thanks to structural conditions, which have remained unchanged for a long time. Yet, in the last 10-15 years the institutional and structural environment of the Italian academic profession has changed both in the field of teaching and in the field of research. Thus, we should briefly review these changes, and try to analyse their impact on academic work in Italy[2].

[2] We present data both from the international version of the questionnaire and from an Italian

2. The reform of study programmes

The reform of study programmes, started in 1999, represents one of the major changes in the Italian higher education system in recent times. The long lasting national framework, mainly based on one long cycle of study (*corsi di laurea* lasting 4-6 years) and on one degree (the *laurea*), has been completely replaced by a European framework, promoted by the Bologna Declaration, based on two cycles of study following a bachelor/master scheme or – as it is known to the Italian public – by reference to the length of the two cycles, a "3 plus 2" scheme leading to two degrees (the new *laurea* and the new *laurea specialistica*, later renamed *laurea magistrale*). Only doctoral programmes, introduced in 1980, and professional study programmes regulated by European directives (medicine, dentistry, pharmacy, and veterinary medicine) were left unchanged. As a consequence, the reform gave a strong push towards a steeper vertical curricular differentiation within Italian higher education.

The reform pursued several goals:

- to increase the proportion of the population earning a higher education degree, as this proportion was, and still is, one of the lowest among developed countries;
- to reduce actual study duration, which was far exceeding the legal duration;
- to reduce the number of drop-outs, which had grown dramatically following the quantitative expansion of the university system;
- to enhance student mobility, by both introducing a credit system (the European Credit & Transfer System) and offering opportunity to enrol in a second level study programme at an institution different from the one from which a student graduated at the first level, fostering, as a consequence, inter-institutional competition.

Reform has also had other complementary aims. The more important have been to enhance the relations between universities and the world of work, and graduate employability, providing employers with better information on graduates, strongly developing stages and internships, fostering cooperation in

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version providing data which were not included in the international data set. Italian academics are compared to their more similar (or least dissimilar) colleagues of four other European countries, that is, academics working in universities, including also some differences in disciplines. Results from descriptive analyses (both one and two variables) are presented applying to data weights that take into account academic rank, discipline, gender and type of institution (W_TOTAL).

curricula development with industries and other stakeholders, and acknowledging students' previous job experiences as part of their curriculum.

Two further elements, looking at the background to the reform and its implementation, need to be considered in order to gain a better understanding of it. First, the reform of study programmes has to be considered as a further step towards university autonomy. Although university autonomy was stated in the Italian Constitution of 1946 (see *Costituzione della Repubblica Italiana*, sect.33), only in 1989 did Government propose and Parliament approve the law that translated the constitutional principle into practice. Law n.168/1989 defined five types of university autonomy (didactic, scientific, organisational, financial and book-keeping) and started the process of university "autonomisation". The first step of the process consisted in the 1993 reform of university financing which gave universities financial autonomy (Law n.537/1993, sect.5). The second step, starting in 1995 (Law n.236/1995, sect.6), consisted not only in giving universities the right to issue their own statutes and regulations but also the obligation to do so. Last came didactic autonomy. The Ministry's University Decree n.509/1999 restructured university study programmes, established new degrees, and provided a general framework for the implementation of didactic autonomy: normative tools to organise study programmes and to regulate access, definition of groups of study programmes, curricular frames for each group, and a credit system.

The implementation of the reforms can be divided into three phases.

1. By the academic year 2001/2002, about 2,800 new first-cycle study programmes were ready to start, a few more than the 2,600 programmes of the old system. Students were given three options: to complete their study within the old study programmes if they enrolled before the reform; to transfer from the old study programmes to the new ones; to enrol in the new study programmes if they were new comers. As a consequence, for some time (3-5years) two parallel study tracks were provided by universities to their students.

   With few exceptions, starting in the academic year 2002/2003, universities began to offer also about 2,400 second-cycle study programmes. As a consequence, in few years the overall didactic supply of Italian universities arose to 5,000-5,500 study programmes.

   Although the reform aimed at giving single institutions the leadership in its implementation by enhancing their role as corporate bodies, in fact implementation was carried out mainly at Faculty level (that is, the most

important academic unit in the Italian system) by committees composed of academics under the coordination of the Conferences of Faculty Deans, an institutional body acting at the national level. No − or very little − extra resources were provided either by the Government or by single institutions to finance the reform implementation.

2. While implementation of the reform stemming from the Decree n.509/1999 was on its way, Government approved a so-called "reform of the reform" without any serious attempt to evaluate the ongoing implementation process. A new decree, the Ministry of University Decree n.270/2004, replaced the old one substantially maintaining the main guidelines of the original reform yet introducing some novelties. A sharper separation between the two cycles of study programmes was introduced, the second level degree was renamed *laurea magistrale*, a common first year of study was set for first-cycle study programmes belonging to the same or similar groups, the possibility to differentiate first-cycle study programmes according to their function (academic *vs*. vocational) was offered, and some exceptions to the general rules were established in order to meet strong pressures to provide programmes as similar as possible to the old ones in the field of legal professions.
   The implementation of the "reform of the reform" has not been straightforward. Only in 2007 were decrees and guidelines to steer the re-organisation of study programmes according to the new requirements provided. Government intended to take the opportunity of the implementation of the Decree n.270/2004 to rationalise didactic supply by the universities, and to overcome some major weaknesses deriving from the implementation of Decree n.509/1999: proliferation of study programmes, fragmentation of curricula and courses, high number of examinations and excessive work-load for students, excessive use of non-academic teaching staff relying on fixed-term contracts, and barriers to student mobility.
   As a matter of fact, when the Italian CAP team approached academics seeking responses to the questionnaire, deans, professors, and researchers were back at Faculty level to re-organise once again study programmes in order to provide a new and rationalised didactic supply by the academic years 2009/2010 or 2010/2011.

3. The process of implementation of the reform of study programmes has not yet ended. In September 2009, the Ministry of University announced new measures to correct some of the outcomes of the second phase. The

Ministry aims to further reduce the number of study programmes[3], the proportion of first-level graduates enrolling in second-cycle programmes, the number of universities' branches established at regional level, and at providing students with more qualified teaching and support, moving towards the accreditation of university study programmes, and fostering a higher level of effectiveness and efficiency in the entire higher education system. Very likely, universities and academics will need to further restructure their didactic supply in the near future in the frame of a process that seems to be characterised by strong tensions between academics, universities, and government on resources, autonomy, its uses and misuses[4].

3. The evaluation of the reform

According to CAP data[5], Italian academics evaluate negatively the reform of study programmes. Most of them (77%) express a substantially negative evaluation of it with small differences across academic ranks and age groups but some interesting variation across disciplines (Table 3.1). The attitude towards the reform is less negative among academics belonging to the social sciences, business administration, economics, and the medical sciences, while it is most negative among academics belonging to law, the life sciences, and agriculture. Opposition to the reform was especially strong among jurists who, as has been indicated, managed to change some features during the second phase of its implementation.

Besides the general evaluation of the reform, academics were asked to express their view on several specific aspects of the reform. Table 3.2 shows these aspects ranked by the degree of agreement expressed by academics. It is easy to see that a more or less strong agreement refers to four aspects that can be considered as side effects of the reform, while a slight disagreement is addressed

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[3] The Ministry argues that it is necessary to take into account not only the above mentioned 5,500 study programmes but also their internal articulation in specific segments bringing the total number of offered courses to 8,250.

[4] It has to be noted that on November 25, 2009, government has presented to parliament a very broad and ambitious project of university reform regarding institutions' internal organisation, the quality and efficiency of the whole higher education system, and academics' recruitment and status. As a consequence, extremely relevant changes within Italian higher education might be occurring in the near future. Given the state of public finances, this reform, as others before it, is expected to be carried out without additional burden for the State budget.

[5] This section was included only in the Italian version of the questionnaire.

to aspects referring to a selected set of reform goals. Especially important is to stress that more than 3 out of 4 Italian academics (79%) argue that the reform has increased their organisational and managerial work, and that almost 2 out of 3 argue that it has increased their teaching work-load (64%), with very small differences by academic rank, and age group, and small differences across disciplines.

Irrespectively of the evaluation on the ability of the reform to meet its goals, according to academics it has had a strong impact on their work.

Table 3.1 Italian academics expressing a substantially negative evaluation of the study programmes reform by discipline

	%
Humanities, arts, teacher training and education science	75
Social and behavioural sciences	65
Business and administration, economics	66
Law	88
Life sciences	85
Physical sciences, mathematics, computer sciences	81
Engineering, manufacturing and construction, architecture	76
Agriculture	83
Medical sciences, health related sciences, social services	68
Total	77
(N = 1595)	

F2 (IT Questionnaire) All in all, your evaluation of the study programmes reform is ...(Substantially positive; Substantially negative)

Table 3.2 Italian academics' views on several aspects of the study programmes reform (means)

	scale points	N
The reform ... has produced a lowering of students' overall preparation	1.78	1,621
The reform ... has increased academics' organisational & managerial engagement	1.90	1,613
The reform ... has increased academics' teaching work load	2.22	1,594
The reform ... has increased students' work load	2.86	1,587
The reform ... has shorten the time needed to earn a degree	3.23	1,642
The reform ... has reduced the number of drop-outs	3.25	1,622
The reform ... favours student mobility at the national level	3.65	1,635
The reform ... favours student mobility at the international level	3.75	1,633
The reform ... has enhanced the links between higher education and the world of work	3.91	1,616

F1 (IT Questionnaire) Please indicate your views on the following: The reform of study programmes, known as the "3 plus 2" reform ... (Scale of answer 1 = Strongly agree to 5 = Strongly disagree)

4. Teaching work environment, work-load, and responsibilities

The reform of study programmes has been carried out under unfavourable conditions as far as teaching resources are concerned. According to CAP data, Italian academics' evaluation of teaching facilities, resources, and support personnel is not very positive, and Italian academics' teaching work environment appears to be worse than those in other European countries in several respects (Table 4.1). Except for library staff, only a minority gives a positive evaluation to it (Table 4.2).

Table 4.1 Evaluation of teaching facilities, resources, and personnel by country (means)

	FI	DE	IT	NO	UK	Total	N
Classrooms	2.06	2.67	2.90	2.41	2.92	2.62	5,228
Technology for teaching	2.15	2.59	2.94	2.33	2.72	2.60	5,151
Library facilities and services	2.10	2.60	2.54	1.98	2.53	2.37	5,343
Teaching support staff	2.77	3.37	3.74	3.59	2.94	3,35	4,748

CAP survey B3: At this institution, how would you evaluate each of the following facilities, resources, or personnel you need to support your work? (Scale of answer: 1 = Excellent to 5 = Poor)

Table 4.2 Academics positively evaluating teaching facilities, resources, and personnel by country (%)

	FI	DE	IT	NO	UK	Total	N
Classrooms	74	49	37	59	37	49	5,225
Technology for teaching	70	53	36	61	42	50	5,150
Library facilities and services	73	50	53	77	53	60	5,343
Teaching support staff	43	26	15	22	35	26	4,749

CAP survey B3: At this institution, how would you evaluate each of the following facilities, resources, or personnel you need to support your work? (Scale of answer: 1 = Excellent to 5 = Poor; only answers 1 and 2)

Table 4.3 Hours *per* week spent on teaching when classes are in session by country

	FI	DE	IT	NO	UK
Mean	15	12	18	12	16
Median	12	10	16	10	15

CAP survey B1: Considering all your professional work, how many hours do you spend in a typical week on each of the following activities? Hours *per* week spent on teaching (preparation of instructional materials and lesson plans, classroom instruction, advising students, reading and evaluating student work)

Table 4.4 Hours *per* week spent on teaching when classes are not in session by country

	FI	DE	IT	NO	UK
Mean	5	5	7	3	7
Median	2	2	6	0	5

CAP survey B1: as detailed in footnote to Table 4.3.

Table 4.5 Proportion of teaching responsibilities devoted to instruction by level and country (%)

	FI	DE	IT	UK	Total
Undergraduate programs	23	38	53	59	45
Master programs	53	54	38	25	42
Doctoral programs	17	5	6	11	8
Continuing professional education programs	2	2	2	3	3
Other programs	4	1	1	1	2
Total	100	100	100	100	100
(N = 3807)					

CAP survey C1: Please indicate the proportion of your teaching responsibilities during the current academic year that are devoted to instruction at each level below and the approximate number of students you instruct at each of these levels
Note: question was not asked in Norway

Table 4.6 Approximate number of students academics instruct by level and country (means)

	FI	DE	IT	NO	UK	Total	N
Undergraduate programs	51	71	90	63	82	78	3,182
Master programs	34	37	39	25	24	34	3,291
Doctoral programs	9	8	8	6	5	8	1,478
Continuing professional education programs	17	17	50	20	29	34	629
Other programs	21	36	41	39	35	33	373

CAP survey C1: as detailed in footnote to Table 4.5. Question was asked in Norway

Further, Italian academics' teaching work-load, hours *per* week spent preparing instructional materials and lesson plans, in classroom instruction, advising students, reading and evaluating student work, is heavier than that of their colleagues in other European countries both when classes are in session and when they are not (Table 4.3 and 4.4).

At the time of the CAP survey, when the new structure of study programmes was completely in place, Italian academics' teaching responsibilities appear to be concentrated on undergraduate or first-cycle

programmes where it is more likely to face higher numbers of students to instruct (Tables 4.5 and 4.6). Although their conditions are similar to those of their British colleagues, Italian academics' overall teaching responsibilities appear to be heavier than elsewhere.

All in all, it can be said that the reform of study programmes following the Bologna Process of harmonisation of European higher education has increased Italian academics' teaching duties bringing their teaching work load and responsibilities to levels similar to those of their British colleagues but higher than those of their colleagues in other European countries. This process has occurred under working conditions which are very different from what we find in the Nordic countries but more similar to those in other big European countries such as Germany and the United Kingdom.

5. Continuities and changes in the national research system

The Italian research system is characterised by two main features: 1) a rate of R&D expenditure on GDP which is still one of the lowest among developed countries[6]; 2) recent changes in the structure and rules of the research system, starting in the '90s and aiming at re-organising the network of public research entities, introducing competitive allocation of research funds, widening and enhancing Italian researchers' participation in international − and especially European − projects, and fostering or strengthening links between research organisations and industry. Some of these changes have had, and still have, a direct impact on university research. Five of them are worth mentioning: 1) the reform of university research financing; 2) the slowly increasing importance of evaluation of research projects and outputs in the allocation of the fund for ordinary financing of universities[7]; 3) a package of policy measures promoting stricter links between academics and the economic sector; 4) reform of intellectual property rights legislation; and 5) establishment of university technology transfer offices as a consequence of points 3) and 4) and other policy measures.

1) For almost two decades (1981-1997), the annual funding for research provided by the Ministry of University to universities was divided into two parts:

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[6] The rate of private expenditure on R&D, measuring the economic sector's direct involvement in research activities, is also one of the lowest among developed countries.

[7] This fund, currently amounting to about €7 billion, is the main source of funding for universities.

60% of it was distributed by ministerial order to universities who in turn assigned individual funds to their academics, and 40% of it was allocated directly by the Ministry to national research projects, so-called "research projects of national interest and of relevant interest for the development of science" (PRIN), on the basis of proposals put forward by special committees within the National University Council (CUN), an academic-based elective body representing academics' interests and requests (President of the Republic Decree n.382/1980, sect.65). This state of affairs changed first in 1993 with the reform of university financing, as already mentioned, a major step towards universities' autonomy, which included the 60% quota within the fund for ordinary financing of universities (Law n.537/1993, sect.5); and second in 1997 with the reform of the financing procedures for national research projects, which can be considered as a key reform in the field of university research financing (Ministry of University Decree n.320/1997). Retrospectively, the situation of university research financing before the 1997 reform can be summarised as follows:

- funds were allocated according to a *de facto* practice that ensured that each academic or group of academics proposing a research project would receive some resources (so-called *finanziamento a pioggia*, where the reference to rain, *pioggia,* recalls the fact that rain nurtures any kind of fields or plants irrespectively of their quality);
- *ex-ante* evaluation and selection of research projects were badly lacking;
- adequate financial statements and *ex-post* evaluation of funded projects were practically absent;
- researchers were neither stimulated to gather around major themes of research nor they were encouraged to engage in projects with an international scope.

The 1997 reform aimed at:

- strongly mitigating the dispersion of scarce public resources by concentrating funds on fewer projects on the basis of merit;
- fostering institutions' research units' and academics' accountability and responsibility through the co-financing of projects, requiring adequate accounting, and stronger control over projects' implementation (timing, management *etc*.);
- implementing an effective *ex-ante* selective evaluation of research projects, and an *ex-post* quality control on research products;
- aligning Italian procedures to European directives.

All in all, the reform aimed at turning the old system into a new system based on the competitive allocation of research funds.

2) The distribution among universities of the fund for ordinary financing established by the 1993 reform required the formulation of an allocation scheme. Since approval of the reform, several schemes have been set up. One of them, first approved in 2004, stated that 30% of the fund had to be distributed on the basis of evaluation of the results of scientific research activities. Yet even after the first national research assessment exercise (VTR, *Valutazione triennale della ricerca*, referring to the years 2001-2003) was carried out in the years 2004-2005, providing for the first time ever an overall evaluation of the Italian research by broad scientific areas and a first official ranking of the Italian higher education system based on the evaluation of research products, in the period 2004-2008 the share of the fund distributed according to the results of several assessment activities was always very modest, less than 5% of the total (quite far from the 30% suggested by the allocation scheme). Within this share, the contribution of assessment activities on research, either carried out *ex-ante* (like the ones mentioned in point 1 above) or *ex-post* (like VTR), was even more modest.

Very recently, government has proposed (Law Decree n.180/2008) and parliament has approved (Law n.1/2009), an allocation of part of the fund (7%) for the ordinary financing of state universities, equal to little more than €500 million, to be increased in the future according to the quality of universities' teaching and training, research, and management. Two-thirds of this allocation is to be assigned according to the quality of research measured by three indicators: a) evaluations of research quality produced by the committee for the evaluation of research activities (50%); b) the number of academics participating in national research projects, such as projects of national interest (PRIN), which have been assessed positively (20%); c) universities' ability to gain access to European research funds (30%). All in all, it can be said that the share of the fund for ordinary financing of universities allocated according to the outcomes of selective and competitive procedures based on the assessment of the quality of research, although still very limited, is increasing.

3) At the end of the 1990s, a policy package jointly produced by the Ministry of University and the Ministry of Labour introduced three major innovations concerning the linkages between universities and the economic sector. The package (Legislative Decree n.297/1999) promoted: 1) the temporary placement of academics and researchers within companies; 2) the creation of university spin-off companies and university incubators; 3) the participation of academics

as well as public research institutions' researchers in starting up new firms and getting involved in commercial activities; 4) university/industry collaborations fostering industrial research projects both at national and trans-national levels supported by public funding; 5) the creation of university consortia and research centres; and 6) R&D policies involving regions, universities, and enterprises, supported by central Government funding. It must be stressed that Italian academics, as civil servants, were legally prevented from being involved in industrial and commercial activities, with the exception of part-time academics, in particular those belonging to the fields of law, medicine, engineering, and architecture, who were allowed to run professional activities. This kind of legal constraint lasted until the 1999 Decree, which, pivoting on the enlargement of university autonomy, deeply changed the normative framework by enacting a favourable regulative environment to support R&D projects, technology transfer from universities, and a wider participation of academics in innovation processes.

4) Related to the 1999 package is a set of measures deeply reforming the regulation of intellectual property rights (Law n.383/2001, sect.7; Legislative Decree n.30/2005). The new legislation, on so-called industrial property rights (DPI), which are related to several innovations "among which there are inventions stemming from scientific research to be applied in industry", establishes that DPI can be secured only through patenting, and that the inventor /researcher is the exclusive owner of DPI, except when he or she is an employee. This last norm does not apply to university and university employees. In fact when the inventor/researcher is a university employee, he or she remains the only owner of the DPI. Universities, within their autonomy, are called to regulate licensing and relations with third parties. In any case, the university inventor/researcher has the right to receive at least 50% of the earnings or royalties coming from the commercial exploitation of his or her invention.[8]

5) The above innovations have brought the establishment of new technology transfer offices (TTO) within Italian universities. According to NETVAL (the Italian Network for valorisation of the university research gathering 44

[8] It has to be noted that very recently government has approved a reform of the legislation on industrial property rights shifting the ownership of inventions stemming from university research from university researchers and professors to their institution. Only if a university does not secure a patent on an invention within six months can the author patent it by him or herself. Parliament is called to adopt the reform within the summer of 2010.

universities), by the year 2007, when the CAP survey was carried out, almost 80% of the existing 75 Italian universities had their own TTO. Of the Italian universities' TTOs, 90% were engaged in supporting university spin-offs, and managing intellectual property rights, 70% were supporting and managing licensing activities, while 45% were managing research contracts and collaborations with industry.

6. Research work environment and research funding

Some of the features of the national research system briefly described in the previous paragraphs are reflected in CAP data which also provide other important information on Italian academics' research activities. Most of the Italian academics (85% with small differences across disciplines) support the view that the organisation of university life and bureaucratic paper-work makes it more and more difficult to dedicate oneself to research activities[9]. Further, Italian academics' evaluation of the research facilities, resources and personnel provided by their institutions is quite negative, actually more negative (3 out of 4 respondents) than other European academics indicate for their research work environment, and is especially negative looking at research funding coming from their own university (Table 6.1). This last occurrence is the more unfortunate if we consider that an academic's own institution, as a result of some of the institutional features described in the previous paragraphs, such as the quota of the annual research funding assigned to universities by Government or the university/government co-financing of research projects of national interest, still is the main source of research funds. On average, nearly half of Italian academics' research funds come from their own institutions (Table 6.2). This situation might explain why also in Italy the pressure to raise external research funds has been increasing (Table 6.3).

Dependency on institutional research funds to finance Italian academics' research activities varies a lot across disciplines: on average, in the humanities and the law field respectively 73% and 66% of academics' annual research funding comes from their own institution, while in engineering and architecture, and in natural sciences and agriculture the proportions are 33% and 43%. Further, in these last sectors, where research is more costly, the pressure to raise external funds appears to be higher.

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[9] This item was included only in the Italian version of the CAP questionnaire.

Table 6.1 Evaluation of research facilities, resources, and personnel by country (means)

	FI	DE	IT	NO	UK	Total	N
Laboratories	2.46	2.61	3.18	2.67	2.79	2.84	3883
Research equipment and instruments	2.43	2.53	3.15	2.58	2.89	2.79	4462
Research support staff	2.92	3.25	3.75	3.80	3.14	3.42	4767
Research funding	3.36	3.40	4.18	3.44	3.68	3.70	5116

CAP survey B3: At this institution how would you evaluate each of the following facilities, resources or personnel you need to support your work? (Scale of answer: 1 = Excellent to 5 = Poor)

Table 6.2 Average percentage of research funds by origin of funding and country

	FI	DE	IT	NO	UK	Total
Your own institution	33	42	49	51	38	44
Public research funding agencies	34	28	18	30	28	26
Government entities	11	11	15	7	19	12
Business firms or industry	9	10	8	4	4	8
Private not-for-profit foundations/agencies	10	7	5	5	8	7
Others	3	2	3	2	3	3
(N = 3807)						

CAP survey D7: In the current (or previous) academic year, which percentage of the funding for your research came from …

Table 6.3 Pressure to raise external research funds

	FI	DE	IT	NO	UK	Total
The pressure to raise external research funds has increased since my first appointment						
% of academics who agree (answers 1 and 2)	76	81	77	76	80	78
degree of agreement (scale points, means)	1.86	1.79	1.89	1.86	1.74	1.84
(N = 4831)						

CAP survey D6: Please indicate your views on the following (Scale of answer 1 = Strongly agree to 5 = Strongly disagree)

During periods other than teaching sessions, research work-load *per* week in activities such as reading literature, writing, conducting experiments, fieldwork is greater in Italy than in other countries except Finland (Table 6.4). When classes are in session and, as it has been shown, Italian academics' teaching work load is heavier than elsewhere, research work-load diminishes but less than in two other countries (Table 6.5).

Table 6.4 Hours *per* week spent on research when classes are not in session by country

	FI	DE	IT	NO	UK
Mean	26	23	27	19	21
Median	30	24	27	20	20

CAP survey B1: Considering all your professional work, how many hours do you spend in a typical week on each of the following activities? Hours *per* week spent on research (reading literature, writing, conducting experiments, fieldwork)

Table 6.5 Hours *per* week spent on research when classes are in session by country

	FI	DE	IT	NO	UK
mean	19	18	17	15	14
median	18	16	15	10	10

CAP survey B1: as detailed in footnote to Table 6.4.

While in estimating academics' time budget reference to research activities is quite generic, the CAP survey also provides a more detailed picture. In fact, academics can be involved in scientific tasks related to research activities such as preparing experiments and inquiries, conducting them, supervising a research team or graduate research assistants. They might also be engaged in administrative and managerial tasks such as answering calls for proposals or writing applications for research grants, managing research contracts and budgets, purchasing or selecting equipment and research supplies. Finally, research entails dissemination activities such as writing academic papers that contain research results or findings, or being involved in the process of technology transfer. Table 6.6 shows that academic commitment to research scientific tasks (that is people who are currently involved in all the three mentioned activities) is greater in Italy and in Germany than elsewhere in Europe. Further, academic involvement in research administrative & managerial tasks is greater in Italy than in the other selected European countries. Finally, academic time devoted to one or both dissemination activities is less in Italy than elsewhere. This state of affairs, especially the heavier administrative burden, is possibly the result of the structural conditions in which Italian academics work (see Table 6.1): fewer financial resources, unfriendly institutional environment, poorer facilities and support.

Within the Italian academic body research commitment is very

differentiated, clearly opposing the hard sciences (life sciences, physical sciences, mathematics, computer sciences, engineering & architecture, agriculture, and medical sciences) to the humanities (humanities, arts & education science, and law) with the social sciences, business & economics in between (Table 6.7).

Table 6.6 Academics' commitment to research activities by country (%)

	FI	DE	IT	NO	UK	Total
Strongly committed to …						
… scientific tasks	29	36	37	24	31	33
… administrative & managerial tasks	21	28	36	18	26	27
Committed to …						
… dissemination of research results	89	91	84	88	95	88
(N = 4933)						

CAP survey D3: Have you been involved in any of the following research activities during this (or the previous) academic year? (Preparing experiments, inquiries *etc*.; Conducting experiments, inquiries *etc*.; Supervising a research team or graduate research assistants; Writing academic papers that contain research results or findings; Involved in the process of technology transfer; Answering calls for proposals or writing research grants; Managing research contracts and budgets; Purchasing or selecting equipment and research supplies)
Scientific tasks = Preparing experiments, inquiries *etc*.; Conducting experiments, inquiries *etc*.; Supervising a research team or graduate research assistants
Administrative & managerial tasks = Answering calls for proposals or writing research grants; Managing research contracts and budgets; Purchasing or selecting equipment and research supplies
Dissemination of research results = Writing academic papers that contain research results or findings; Involved in the process of technology transfer

Table 6.7 Italian academics' commitment to research activities by discipline (%)

	Humanities & Education science	Social sciences, business & Economics	Law	Sciences	Engineering & Architecture	Medical sciences	Total
Strongly committed to …							
… scientific tasks	15	28	4	48	37	46	37
… administrative & managerial tasks	21	22	24	43	45	42	37
Committed to …							
… dissemination of research results	67	88	50	92	93	82	84
(N = 1588)							

CAP survey D3: Have you been involved in any of the following research activities during this (or the previous) academic year? Defined as in footnote to Table 6.6

7. Impact of environmental changes on internationalisation and links with the economic sector

The environmental changes described in section 5 were enacted to enhance the internationalisation of Italian academics' research and to foster collaborations with the economic sector. While CAP data cannot provide a precise assessment of the changes that occurred in these two domains, nevertheless they can provide a picture of the situation relative to what has happened in other European countries, and point out differences among Italian academics.

7.1. Internationalisation of research efforts and results

According to several indicators (Table 7.1), international research collaboration with foreign colleagues is more widespread in Italy than in Germany but less than in Finland. Italian academics express stronger feelings on the international scope and orientation of their primary research than their other European colleagues, while they appear less keen to publish in a foreign language[10] (obviously excluding the UK) or in a foreign country. Finally, they employ in research a language other than their mother tongue about as much as their Nordic colleagues and more than their German ones.

Table 7.1 Research efforts and results: indicators of internationalisation by country

	FI	DE	IT	NO	UK	Total	N
Academics collaborating with international colleagues (%)	72	45	59	60	61	60	5,094
Emphasis of primary research is international in scope or orientation (means)	2.38	2.76	1.97	2.24	2.40	2.30	4,601
Academics with no publications in the last three years …							
… published in a language different from the language of instruction at your current institution (%)	21	17	22	8	89	27	4,774
… co-authored with colleagues located in other (foreign) countries (%)	55	58	57	55	58	57	4,776
… published in a foreign country (%)	25	33	34	24	45	32	4,778
Academics employing a language other than their mother tongue in research (%)	71	53	68	70	18	58	5,303

CAP survey D1: How would you characterize your research efforts undertaken during this (or the previous) academic year? Do you collaborate with international colleagues? (yes)
D2: How would you characterize the emphasis of your primary research this (or the previous) academic year? (Scale of answer 1 = Very much to 5 = Not at all)
D5: Which percentage of your publications in the last three years were … published in a language different from the language of instruction at your current institution; co-authored with colleagues located in other (foreign) countries; published in a foreign country
F12: Which language do you primarily employ in research?

[10] 93% of them employ their mother tongue, that is Italian, as teaching language.

Referring to the same set of indicators it is possible to realise how big are disciplinary differences as far as the internationalisation of research is concerned. While international collaboration is widespread not only within hard sciences but also within humanities and arts, other indicators highlight the sharp difference between hard sciences and the other disciplines with natural sciences being the most internationalised area and law the least internationalised (Table 7.2).

Table 7.2 Research efforts and results in Italy: indicators of internationalisation by discipline

	Humanities & Education science	Social sciences, business & Economics	Law	Sciences	Engineering & Architecture	Medical sciences	Total	N
Academics collaborating with international colleagues (%)	53	46	48	71	59	51	59	1,635
Emphasis of primary research is international in scope or orientation (means)	2.02	2.25	2.28	1.84	1.90	2.01	1.98	1,411
Academics with no publications in the last three years …								
… published in a language different from the language of instruction at your current institution (%)	48	37	64	6	13	11	21	1,653
… co-authored with colleagues located in other (foreign) countries (%)	83	71	90	37	58	58	57	1,654
… published in a foreign country (%)	51	50	64	17	28	37	33	1,653
Academics employing a language other than their mother tongue in research (%)	43	58	21	81	70	80	68	1,636

CAP survey questions D1, D2, D5, and F12 as detailed in the footnote to Table 7.1

7.2. Links with the economic sector

As far as the economic valorisation of research results and direct links with the economic sector are concerned, Italian academics' situation is similar to those of their European colleagues, at times distant from the leading nation but sometimes closer to it. Again, looking at the institutional environment in which academics work, the Italian situation is similar to that of most of the other countries, though at times remote from that of the leading nation. Finally, considering the possible negative effects of links with the economic sector, in Italy restrictions on the publication of results from privately-funded research appear to be far less widespread than in Germany, where this effect seems to be more serious, and external sponsors' or clients' influence over research activities has the same moderate strength as in the other countries, except Norway (Table 7.3).

Table 7.3 Indicators of academics' links with the economic sector by country (%)

	FI	DE	IT	NO	UK	Total	N
Academics ...							
...whose primary research is commercially-oriented/intended for technology transfer	20	17	15	14	16	16	4,265
... involved in the process of technology transfer	31	15	15	12	16	17	4,934
... who have secured one or more patents on a process or invention	5	10	6	3	4	6	4,972
... who support the view that restrictions on the publication of results from their privately-funded research have increased since their first appointment	18	26	12	17	10	16	4,214
... who don't agree or weakly agree with the view that external sponsors or clients have no influence over their research activities	32	33	31	19	34	30	4,722
... whose institution emphasizes commercially-oriented or applied research	38	32	36	33	52	38	4,831
% of external research funds coming from a private source	18	18	14	9	12	14	4,736

CAP survey D2: How would you characterize the emphasis of your primary research this (or the previous) academic year? Commercially-oriented/intended for technology transfer (Scale of answer 1 = Very much to 5 = Not at all; only answers 1 and 2);
D3: Have you been involved in any of the following research activities during this or the previous academic year? Involved in the process of technology transfer (yes);
D4: How many of the following scholarly contributions have you completed in the past three years? Patent secured on a process or invention;
D6: Please indicate your views on the following … Restrictions on the publication of results from my privately-funded research have increased since my first appointment (Scale of answer 1 = Strongly agree to 5 = Strongly disagree; only answers 1 and 2); External sponsors or clients have no influence over my research activities (Scale of answer 1 = Strongly agree to 5 = Strongly disagree; only answers 4 and 5); Your institution emphasizes commercially-oriented or applied research (Scale of answer 1 = Strongly agree to 5 = Strongly disagree; only answers 1 and 2);
D7: In the current (or previous) academic year, which percentage of the funding for your research came from … Business firms or industry, Private not-for-profit foundations/agencies.

As might be expected, links with the economic sector vary considerably across disciplines. By far, engineers and architects are the most extensively connected with the economic sector as their research is much more commercially-oriented: they are much more involved in technology transfer, they secure patents more than others, the proportion of their research funds coming from the private sector is higher, and they work in institutions, mainly the polytechnics, that emphasise commercially-oriented or applied research. Natural scientists (including agricultural scientists), and medical scientists come second, and those in other disciplines follow at times at a great distance. It's interesting to note that in the medical field, the proportion of funds coming from the private sector is just the same as it is in the engineering and architecture areas. Again in the medical field, increasing restrictions on the publication of results coming from privately-funded research are more pronounced (albeit not

widespread), while the influence of external sponsors or clients is more perceived in the humanities, together with engineering and architecture (Table 7.4).

Table 7.4 Indicators of Italian academics' links with the economic sector by discipline (%)

	Humanities & Education science	Social sciences, business & Economics	Law	Sciences	Engineering & Architecture	Medical sciences	Total	N
Academics ...								
...whose primary research is commercially-oriented / intended for technology transfer	3	8	3	16	37	16	15	1,211
... involved in the process of technology transfer	4	4	0	16	34	19	15	1,586
... who have secured one or more patents on a process or invention	1	0	0	8	14	6	6	1,622
... who support the view that restrictions on the publication of results from their privately-funded research have increased since their first appointment	10	10	8	11	15	19	12	1,278
... who don't agree or weakly agree with the view that external sponsors or clients have no influence over their research activities	37	23	24	31	36	30	31	1,461
... whose institution emphasizes commercially-oriented or applied research	21	30	35	39	51	37	37	1,528
% of external research funds coming from a private source	4	9	3	12	24	24	13	1,559

CAP survey questions D2, D3, D4, D6, and D7 as detailed in the footnote to Table 7.3

8. Conclusions and further themes for discussion

The brief overview provided in the previous paragraphs allows some conclusions to be drawn and the relationship of some possible themes for discussion on teaching, research to be highlighted.

Teaching

Following the reforms connected to the Bologna process, the teaching work-load and teaching responsibilities of Italian academics have grown becoming similar to those of their European colleagues. Instructional activities are now distributed on three levels (bachelors, masters, doctors) although a higher proportion of teaching responsibilities is dedicated to first-cycle programmes. Italian academics' teaching work-load appears to be heavier,

possibly because of a higher number of students to instruct, poorer teaching facilities, other institutional features such as the number of examinations *per* term, which is generally higher than in other countries, and the troubled and demanding implementation process of the study programmes' reform.

Looking at what happened in the last decade and partially investigated by the CAP survey, at least two broad issues appear. First, the reform of study programmes has reshaped the structure of Italian didactic supply but has left unsolved several problems strictly linked to teaching. Four are worth mentioning. While the reform has introduced a steeper vertical curricular differentiation, with a strong impact on teaching responsibilities, it has hardly answered the problem of horizontal or functional curricular differentiation. Although the "reform of the reform" has tried to tackle this problem, the balance between, and the location of, academic and vocational functions within higher education has not been clearly defined (except for the vocational programmes in the medical and health sector, which have been restructured but already existed before the reform).

The reform has had an immediate positive effect on some of the traditional problems of the Italian higher education system such as the long duration of studies and the high number of drop-outs. Yet as the new study provision settles down these problems tend to return as is reflected in the academics' views reported in Table 3.2. Academics are aware also of another problem still to be solved: the links between higher education and the world of work, and graduates' employability. Although the reform has provided important contributions in this domain (*e.g.* developing stages and internships), the long and troubled transition from the old to the new system, and the supply for nearly a decade of different types of graduates (graduates holding the "old" degree after having completed their study within the old programmes, "hybrid" graduates holding the "new" first cycle degree but having transferred from an "old" programme to a "new" one, graduates holding the "new" first-cycle degree having completed a "new" programme, graduates holding a "new" second-cycle degree) have not helped to enhance the already difficult links between supply and demand of the highly qualified labour force. Finally, a fourth problem, probably connected to the previous ones, has to be mentioned. The reform has reshaped the form of university teaching but – at least up to now – it has hardly changed the substance, that is, its contents and methods. An example of this is the so-called "bonsaisation" of study courses (teaching units). As courses' duration had to be reduced, it was considered enough simply to cut parts of the old courses almost without any other substantial change. The old wine of traditional teaching was

poured into new barrels largely missing the opportunity to rethink either the contents or methods in order to translate into practice both the word and the spirit of reform.

A second broad issue refers to teaching as the battle ground for university autonomy. What happened in Italy is an example of this. The reform of study programmes was meant to offer limited but considerable autonomy to universities. In fact, the reform was implemented by the academic body more than by institutions. Academics effectively implemented it in a very short time and with few resources; yet they also managed to promote and defend their interests triggering Government's reaction when both centre-left and centre-right cabinets were in office. Academics' (and universities') answers to the first set of corrective measures have been considered unsatisfactory by Government who plan to enact a second wave of corrective measures. In the process, university autonomy on study programmes, didactics, and teaching has already been (and very likely will again be) reduced. It can be argued that the tension between autonomy and centralisation, a long lasting feature of the Italian higher education system, is recurring. Whether re-centralisation of regulation of university teaching will bring positive outcomes or not is an issue open to further debate and inquiry.

Research

The "Annual report on innovation" edited by the Rosselli Foundation together with the Italian main daily newspaper *Il Corriere della Sera* provides an analysis of the main industrialised countries' "innovative potential". According to it, in the year 2007 (when the CAP survey was carried out) all the European countries used in this paper as terms of comparison, not to speak of non-European countries such as the US and Japan, were more successful than Italy in the overall "system of innovation" ranking. The ranking is based on an innovation index summarising official data from the most reputable international and national organisations in seven broad areas: scientific and technological knowledge, ICT, human capital, financial support to research activities, economic context, institutional context, and country infrastructure. In all these areas, Italy lagged behind the other countries. Especially impressive are the very low proportion of graduates in the population (although among young people things are getting better), and the very low level of R&D expenditure as a proportion of GDP, to which we can add the very small numbers of researchers in the labour force, and the limited share of total public expenditure for education provided to higher education. The gap is somewhat smaller with

respect to technology transfer between university and industry, patenting, and venture capital.

This information helps to better assess the picture of Italian academic research drawn from CAP data. Research work-load and commitment to scientific research tasks are quite high. Internationalisation of research activities is quite good (less so for research results), and the extent of links with the economic sector is similar to that found in other European countries although often a step behind them. But, academic research is carried out in a less favourable work environment, research funding provided by institutions is perceived to be poorer than elsewhere, the share of research resources coming from external sources is smaller, research administrative and managerial tasks are much more demanding, and are carried out in an unfriendly environment.

A comparison based on CAP data with Finland, which is at 3rd place in the 2007 "system of innovation" ranking (after Sweden and Denmark and just before the US), and at 2nd place in the 2008 ranking, is rather illuminating.

While the research work-load of respective academics is quite similar when classes are not in session, Finns dedicate more hours *per* week to research when classes are in session. On the other hand, there are more academics strongly committed to scientific research tasks, and especially to research administrative tasks, in Italy (though slightly less committed to dissemination activities). Internationalisation of research is similar in the two countries but Finnish academics collaborate more with international colleagues and publish more in foreign countries. While more or less the same proportion of academics work in institutions emphasising commercially-oriented or applied research, the proportions of Finnish academics whose primary research is commercially-oriented or intended for technology transfer − and especially of those directly involved in technology transfer − are higher (but the proportion of Italian academics securing patents is slightly greater).

As far as resources are concerned, the differences between the two countries fall always in the same direction. While in Finland academics' evaluation of the research facilities provided by their institutions is on average always positive, it is always negative among Italian academics. The gap is especially wide for research support staff and for research funding. Moreover, while on average in Italy, half of academics' research funds come from their institution, this proportion is only one-third in Finland where the proportion of external funds, especially from public research funding agencies and government entities, is higher.

This rough comparison suggest that the main source of academic research's

problems in Italy lies in the organisation of research efforts at the institutional level and in the limited funding of research activities at all levels. Both issues cannot be simply confined within higher education but need to be placed in the wider frame of the relationship between higher education and Italian economy and society.

The relationship between teaching and research

Evidence collected through the CAP survey regarding both teaching and research suggest that the traditional attitude of Italian academics towards the relationship between the two activities is under stress, or very likely will be so in the near future.

On the one hand, teaching work-loads and responsibilities have increased, and new efforts will be required to enhance teaching quality in the near future. On the other hand, pressures to raise more external research funds, considerable efforts spent in administrative and managerial research tasks, an unfavourable research working environment, make it more difficult to gain time and resources for research activities. Further the growing importance of teaching and research evaluation within the Italian higher education system, an issue addressed by the CAP survey to which we have only referred briefly in this paper, will add more pressure on academics and their work. Even though the traditional view on teaching and research links is well rooted in the Italian academy, and there are good reasons to continue to pursue it and to reshape it in new and creative ways, still pressures to differentiate research *vs*. teaching institutions, and research *vs*. teaching academic staff will probably increase in the future challenging the Italian academic profession just as it has in other countries. Sharp disciplinary differences, especially with regards to research funding and commitment, the degree of internationalisation, and links with the economy, suggest that these challenges will hit the Italian academic body in different ways and to a different extent, triggering different reactions and deepening the cleavages that already fragment the academic profession. Thus, a further theme for discussion and inquiry will be the ability of Italian universities, slowly becoming more corporate entities, to face both the tension between teaching and research, and the tensions among academic disciplines.

Teaching and Research in Higher Education in South Africa: transformation issues

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Introduction

As is characteristic of periods of political and social transition, South African higher education is in considerable flux. Multiple initiatives are underway as the new democratic government, the Council on Higher Education, various stakeholder organizations, and some 23 universities attempt to reconstruct and transform South Africa's higher education legacy in relation to new policy goals, formulated through a long and extensive process of teaching, research, debate, and consultation.

Badat (1999) points out that the higher education transformation agenda has its source in three related conditions. First, the inherited system was designed, in the main, to reproduce, through teaching and research, white privilege and black subordination in all spheres of society. Higher education was characterized by a lack of vision, a paralysis in policymaking, and problems of legitimacy and other conflicts around governance. Further, it was fragmented and divided along racial and ethnic lines, and reflected severe social inequalities of race and gender with respect to student access and success and the composition of academic staff. Finally, major institutional inequities existed

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between what are termed historically white institutions (HWIs) and historically black institutions (HBIs). Thus, a key policy imperative is to transform higher education so that it becomes more socially equitable internally and promotes social equity more generally.

Second, whereas previously research and teaching were shaped by the socioeconomic and political priorities of the apartheid separate development program, higher education is now called on to address and respond to the development needs of a democratic South Africa. These needs are articulated in a fourfold agenda which is directed to "meeting the basic needs of people," "developing human resources," "building the economy," and "democratizing the state and society."

Finally, South Africa's transition is occurring during a period that has witnessed the emergence of a global economy and changes in the world captured by the concept "globalization." It is recognized that, in the words of Martin Carnoy (1998), economic growth, is "increasingly dependent on knowledge and information applied to production, and this knowledge is increasingly science-based." Moreover, there is broad acceptance for Manuel Castells' argument that "if knowledge is the electricity of the new informational international economy, then institutions of higher education are the power sources on which a new development process must rely." (Castells, 1993) Thus, a related challenge facing higher education is to produce, through research and teaching-learning programmes, the knowledge and human resources that will enable South Africa to engage with and participate in a highly competitive global economy.

Higher education policy development, from the National Commission on Higher Education of 1995 to the Higher Education Act of 1997 and the white paper on higher education entitled, "A Programme for Transformation of Higher Education in South Africa," has taken as its point of departure a triple challenge: overcoming the apartheid legacy; contributing to reconstruction and development; and positioning South Africa to engage effectively with globalization. As a result, the following policy initiatives have been drawn up from identified higher education priorities:

- development of a single, differentiated, and coordinated system;
- cooperative governance of the system, institutions, and partnerships;
- increased and broadened participation within higher education to meet human resource needs and advance social equity;
- curriculum restructuring and knowledge production that are responsive to societal interests and needs;

- quality assurance through assessment and promotion of quality and accreditation of programmes;
- incorporation of higher education programmes and qualifications within a national qualifications framework designed to promote articulation, mobility, and transferability;
- improved institutional planning and management and the development of three-year institutional plans; and state funding on the basis of allocated student enrolments and accredited programs with redress funding to overcome historical institutional inequity.

And yet, Badat (1999) notes that despite a high level of consensus around policy goals, instruments, mechanisms, and procedures for achieving policy goals continue to be contested. But of even more concern to this paper is the effect that achievement of such policy goals may be having on the role of academics in their teaching and research activities. In order to determine this effect, the following relevant data from the South African CAP questionnaire were analyzed and interpreted to assess what impact present day policy directed at the transformation of higher education in South Africa was having on the teaching and research activities of academics.

CAP data: teaching and research activities of South African universities (N=805)

Question B1: Time spend on various academic activities

Table 1. Average hours *per* week

	When classes are in session	When classes are not in session
Teaching	21.42	13.34
Research	10.51	17.17
Service	4.96	5.91
Administration	8.69	9.13
Other Activities	5.32	6.36

This set of data indicates:

- academics have a heavy work load − amounting to 50.9 hours of work *per* week when classes are in session, 51.91 when classes are not in session;
- academics have little time for research;
- academics have little involvement in service activities;
- academics have a heavy administrative burden.

Question B2: Regarding your own preferences, do your interests lie primarily in teaching or in research?

- 18.7% primarily in teaching
- 35.44% in both, but leaning towards teaching
- 36.79% in both, but leaning towards research
- 9.61% primarily in research

These data indicate that academics are evenly spread over a teaching-research continuum.

Question B3: At your institution, how would you evaluate each of the following facilities, resources, or personnel when it comes to supporting your work?

Table 2. Distribution of responses (%)

	Good	Average	Poor
Classrooms	41	33	26
Technology for teaching	40	32	28
Laboratories	37	35	28
Research equipment and instruments	36	34	30
Computer facilities	61	25	14
Library facilities and services	71	17	12
Your office space	59	23	18
Secretarial support	37	25	38
Telecommunications (Internet, networks and telephones)	61	19	20
Teaching support staff	30	27	43
Research support staff	26	29	45
Research funding	31	32	37

The data indicate that:

- academics seem fairly satisfied with classrooms, laboratories, technology for teaching, research equipment, library services, computer facilities, office space and telecommunications;
- however, it would seem that there is room for improvement when it comes to research funding, research support, teaching support and secretarial services.

Statement B5: Views on scholarship

Table 3. Scholarship, teaching and service (%)

	Agree	Neutral	Disagree
Scholarship is best defined as the presentation of findings on original research	65	27	8
Scholarship includes the application of knowledge in real-life settings	76	18	6
Scholarship includes the preparation of reports that synthesize the major trends and findings of my field	67	25	8
Teaching and research are hardly compatible with each other	21	19	60
Academic staff in my field have a professional obligation to apply their knowledge to problems in society	66	24	20

The data suggest that:

- academics have a rather pragmatic view of scholarship insofar as they are of the opinion that academics have a responsibility to apply their knowledge to problems in society;
- academics regard, albeit not so strongly, scholarship as original/basic research and as the synthesis of major trends in a field;
- academics do not regard teaching and research as incompatible.

Statement C1: Indicate the proportion of your teaching and the average number of students at each of the following levels

Table 4. Distribution of teaching time

% instruction time Means	Average number of students *per* course Means
Undergraduate 28.63%	195
Masters 23.52%	20.34
Doctoral 15.32%	3.02
Continual professional programmes 13.31%	76.4
Others 19.22%	54

The data indicate that academics have heavy teaching loads, taking into account the average/median class sizes at both undergraduate and postgraduate levels.

Question C2: During the current or previous academic year, have you been involved in any of the following teaching activities?

- Classroom instruction/lecturing: (proportion of positive responses) 85%
- Individualized instruction: 69%
- Learning in projects/project groups: 37%
- Practice instruction/laboratory work: 31%
- ICT based learning/computer-assisted learning: 24%
- Distance education: 47%
- Development of course material: 80%
- Curriculum/program development: 65%
- Face to face instruction with students outside of class: 76%
- Electronic communications (e-mail) with students: 71%

The data indicate that:

- most academics are involved in classroom teaching and individualized instruction; the high involvement in individual and additional instruction reflects the unpreparedness of students for university study and increases the workload of academics;
- due to the technological divide in South Africa little use is made, and can be made, of ICT for teaching and learning

Question C3: Does your institution set quantitative load targets or regulatory expectations for individual faculty for the following?

- Number of hours in the classroom: (proportion of positive responses) 48%
- Number of students in your classes: 36%
- Number of graduate students for supervision: 30%
- Proportion of students passing examination: 41%
- Time for student consultation: 46%

The data establish that academics do find themselves in a rather prescriptive environment of managerialism, as many institutions set quantitative load targets for the number of hours academics have to be in classrooms, number of students they should teach, number of students they should have for supervision, percentage of students that need to pass examinations, and the amount of time they need to set aside for student consultation.

Statement C4: Activities and attitudes related to teaching

Table 5. Responses to statements on activities and attitudes related to teaching (%)

	Agree	Neutral	Disagree
You spend more time than you would like teaching basic skills due to student deficiencies	70	17	13
You are encouraged to improve your instructional skills in response to teaching evaluations	54	27	19
At your institution there are adequate training courses for enhancing teaching quality	47	28	25
Practically oriented knowledge and skills are emphasised at your institution	75	18	7
In your courses you emphasise international perspective or content	59	26	15
You incorporate discussions of values and ethics into your course content	70	19	11
You inform students of the implications of cheating or plagiarism in your courses	85	10	5
Grades in your courses strictly reflect levels of student achievement	74	18	8
Since you started teaching, the number of international students has increased	41	25	34
Currently, most of your graduate students are international	7	10	83
Your research activities reinforce your teaching	64	21	15
Your service activities reinforce your teaching	48	31	21

Amongst other things the responses indicate that academics feel they spend more time than they should on teaching basic intellectual skills because of student deficiencies.

Question D1: How would you characterise your research efforts during this and the previous academic year?

- Do you work individually/without any collaboration on any of your research projects: (proportion of positive responses) 51%
- Do you have collaborators in any of your research projects: 49%
- Do you collaborate with persons at other institutions in your country: 41%
- Do you collaborate with international colleagues: 32%

The responses show that collaborative research within South Africa is quite

strong (about half of respondents do such research), but fewer are involved collaboratively with international colleagues. (less than a third of respondents)

Question D2: How would you characterise the emphasis of your primary research for this and the previous academic year?

Table 6. Emphases of research (%)

	1 Very much	2	3	4	5 Not at all
Basic/theoretical	20	30	29	13	8
Applied/practically oriented	33	42	15	6	4
Commercially oriented/intended for technology transfer	10	13	15	18	44
Socially oriented/intended for the betterment of society	32	33	16	12	7
International in scope or orientation	24	27	25	12	12
Based in one discipline	16	23	19	21	21
Multi-/interdisciplinary	29	32	18	12	9

Responses on a five point scale ranging from 1: very much to 5: not at all

These responses suggest that:

- academics lack a clear orientation in the conceptualization of their research activities; the responses do not indicate any firm preference for research that is basic/theoretical, or practically/commercially oriented;
- academics cannot determine the disciplinary provenance of their research, that is, they span a wide range from research located in one discipline to research that is multi/interdisciplinary.

Question D3: Have you been involved in any of the following research activities during this or the previous academic year?

Percentage of *yes* responses:

- Preparing experiments, inquiries, *etc*.: (proportion of positive responses) 17%
- Conducting experiments, inquiries, *etc*.: 18%
- Supervising a research team or graduate research assistants: 30%

- Writing academic papers that contain research results or findings: 58%
- Involved in the process of technology transfer: 12%
- Answering calls for proposals or writing research grants: 32%
- Managing research contracts and budgets: 17%
- Purchasing or selecting equipment and research supplies: 16%

The data indicate that while most academics do write academic papers containing research results, few are involved in answering calls for proposals, writing research grants, or in managing research contracts or budgets

Question D4: How many of the following scholarly contributions have you completed the past three years?

- Scholarly books authored or co-authored: 0.44
- Scholarly books edited/co-edited: 0.10
- Articles in scholarly journals/book chapters in scholarly books: 1.95

Proportions of respondents who produced one or more of the following in the three year period before the survey:

- Research report/monograph for a funded project: 62%
- Presented a paper at a scholarly conference: 97%
- Wrote a professional article for a newspaper or magazine: 72%
- Secured a patent on a process or an invention: 10%
- Wrote a computer programme for public use: 21%
- Performed or exhibited an artistic work: 29%
- Produced a video or film: 35%

From these responses it is evident that almost all academics do present papers at scholarly conferences, and most write research reports. Few, however, are involved in securing patents or inventions, or in the writing of computer programmes for public use.

Question D5: What percentage of your publications in the last three years were

- Published in a language different from the language of your current institution?
- Co-authored with colleagues located in the country of your current

employment?
- Co-authored with colleagues located in other foreign countries?
- Published in a foreign country?
- Published electronically or on-line?
- Peer-reviewed publications?

The answers show:

- 45% of respondents have not published in a language different from the language of instruction at their current institutions;
- 9% of respondents' publications were co-authored with colleagues located in South Africa;
- 51% of respondents' publications were co-authored with colleagues in foreign countries;
- 4% of respondents' publications were published in a foreign country;
- less than 1% of respondents' publications were published electronically or on-line;
- 50% of respondents' publications were peer-reviewed.

The responses reveal a very low level of internationalisation in academics' research activities

Question D7: In the current and previous academic year, which percentage of your funding for your research came from the following sources?

- own institution: 78%
- public research funding agencies and government entities: 22%
- business firms or industries and private, not for profit agencies: less than 1%

Clearly, most research funding is derived from the respondents own institutions, with little funding from outside institutions.

Question E3: By whom is your teaching and research regularly evaluated?

The results show that academics are generally part of a prescriptive professional environment which witnesses to a significantly high level of managerialism and scrutiny.

Table 7. Evaluation of teaching and research, 'yes' responses

	Your teaching	Your research
The peers in your department/unit	40%	31%
The heads of your department/unit	50%	41%
Members of other departments or units at this institution	17%	19%
Senior administrative staff at this institution	13%	15%
Your students	64%	5%
External reviewers	24%	45%
Yourself (formal self-assessment)	46%	39%
No one at or outside my institution	7%	7%

Question E6: To what extent does your institution emphasise the following practices?

Table 8. Institutional importance of quality in assessing teaching and research

	1 Very much	2	3	4	5 Not at all
Considering the research quality when making personnel decisions	11%	29%	34%	14%	13%
Considering the teaching quality when making personnel decisions	7%	24%	31%	21%	17%

These data reveal that despite heavy teaching loads taking up a substantial amount of academics' time, little attention is paid to teaching competence or research achievement by institutions when appointing or promoting academic staff.

Transformation issues in teaching and research activities in South African universities

The CAP data presented above provide an overview of those salient features which have impacted to a lesser or greater degree on the academic profession as a result of the transformation of higher education in South Africa. But what are some of these *transformational pressures* that have impacted on the academic profession in South Africa when it comes to teaching and research? The following aspects appear to be significant.

- *The displacement of dominant disciplines*. The areas of study, hitherto dominated by historical and educational sciences, became rooted more in the

social and managerial sciences, with much more interest in the future than in the past. The rise of academic planning, the economics of education and the managerial concept of "systems" became more evident.

- *Goal formation for higher education*. The setting of these goals for higher education were directed at raising the general level of higher education amongst the population and using higher education as vehicle for broadening equality of opportunity. In setting these goals, the state influenced indirectly the type of teaching and research agenda in the field of higher education studies.
- *The broadening of access in higher education*. Structural changes were brought about in higher education to investigate new modes of access to knowledge (different program and course structures, contents and teaching methodology) in order to attract a student cohort differing from the traditional cohort with an advantaged background.
- *The destabilisation of the university in its classic form*. In the past the university tended to be cast in a cultural paradigm with its main purpose being the definition and transmission of an elite cultivation of scholarship and learning for its own sake. Transformational pressures, however, saw the government steer higher education and more specifically the mission of the universities towards those activities deemed in the national interest, either through the allocation of extra resources, or mostly, the withdrawal or reduction of previous levels of resource.
- *Efficiency at the point of exit*. Issues of socio-political change, equality and quality introduced quantitative criteria, which not only monitored the progress of students but were also concerned with institutional performance or efficiency at the point of exit.
- *The micro-management of knowledge transmission*. Many activities in higher education teaching and research revolve around aspects of student learning, methods and techniques of learning, and what can be termed the micro-management aspects of knowledge transmission that emphasize the use of the managerial sciences.

These transformational pressures are linked to the inability of higher education to meet the moral, political, social and economic demands of the new South Africa. Strydom & Fourie (1999, pp.161-162) list the deficiencies in higher education which generate these transformational pressures as being:

- The inequitable distribution of access and opportunity for students and staff along lines of race, gender, class and geography. There are gross

discrepancies in the participation rates of students from different population groups, indefensible imbalances in the ratios of black and female staff compared to whites and males, and equally untenable disparities between historically black and white institutions in terms of facilities and capacities.

- There is a chronic mismatch between the output of higher education and the needs of a modernizing community.
- Higher education has an unmatched obligation, which has not been adequately fulfilled, to help lay the foundations of a critical civil society, with a culture of public debate and tolerance that accommodates differences and competing interests.
- While parts of the South African higher education system can claim academic achievement of international renown, too many parts of the system observe teaching and research policies which favour academic insularity and closed system disciplinary programs.
- The governance of higher education at a system level is characterized by fragmentation, inefficiency and ineffectiveness, with too little co-ordination, few common goals and negligible systemic planning.

Concluding remarks

This paper has tried to illustrate what factors in the transformation of higher education in South Africa have led to significant changes in the academic profession in its teaching and research mandate. If higher education is to contribute to the reconstruction and development of South Africa, then the inequities, imbalances and distortions derived from its past and present structure must be addressed, and higher education transformed to meet the challenges of a new non-racial, non-sexist and democratic society committed to equity, justice and a better life for all. In the current turbulent and insecure context, higher education teaching and research have a vital role to play in the development and restoration of the most powerful and consequential of all social institutions in the building of a new South Africa.

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Teaching and Research Activities of the Chinese Academics

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Introduction

It is generally acknowledged that the higher education system, including the academic system, in the People's Republic of China was modeled on that of the Soviet Union (He, 2007). One of the most remarkable characteristics of this model is that university faculty spend the huge majority of their time on teaching activities: their major primary role is expected to be involvement with teaching, while research activities are conducted by researchers in research institutes outside the universities. This was equally true in China prior to the 1980s. However, radical changes have occurred in China, particularly since the latter part of 1990s, when the policy of building up world-class universities was developed by government. Accompanied by other factors, the role of Chinese academics has changed, especially the roles of those in the research-oriented and leading national public universities who are also asked to carry out research activities. In recent years, China's faculty have come to devote more and more of their time to research and published more research, though their output varies greatly by institution and by academic rank. This article addresses the teaching and research activities of Chinese academics based on the major findings from the CAP survey, which was implemented in China in 2007. The article begins by touching on the characteristics of China's academics from a comparative perspective. Then it discusses the major findings about teaching and research activities of China's academics by institution and by academic rank. The article

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concludes by arguing that the academic activities of China's faculty are still basically teaching-oriented in comparison with both Japanese faculty and US faculty, though there exist numerous differences in teaching and research activities as well as views on scholarship and other academic activities by institution and by academic rank.

Numerous definitions are applied to the term "academic profession" according to different contexts and research purposes. For example, it can be interpreted in both a broad sense and a narrow sense. A definition of the academic profession in a broad sense would embrace all persons who teach or conduct research, or produce publications based on scholarly research at higher education institutions or research institutes inside or outside colleges or universities. In a narrow sense, the academic profession is limited to faculty members, including professors, associate professors, lecturers or assistant professors who are mainly involved with teaching and research activities in higher education institutions. This paper places its emphasis on discussion of the academic profession in this narrow sense (Huang, 2009).

Background of China's academics: system, instrument and sampling

Outline of China's higher education system

At present, Chinese higher education institutions can be categorized into two major types: regular institutions and adult institutions. In December 2008, there were 2,263 regular public higher education institutions, constituting the three levels of postgraduate, undergraduate, and short-cycle programs. In the private sector, there were 640 higher education institutions, most of them providing short-cycle programs; only two of them are four-year institutions with authority to confer bachelor's degrees (MOE, 2009). The public institutions are generally divided into three sectors and are vertically administered and financed by one of three types of administrative authorities: (1) national public universities, which are administered by the Ministry of Education (MOE) and other central agencies or departments; (2) local public universities, administered by provinces and province-level municipalities, and (3) local public colleges, which are basically established and administered by municipal authorities. Most of the private institutions are monitored by provincial or municipal governments, although no financial support is provided to them by these governments. According to government statistics, in 2007 the gross enrollment in higher education institutions amounted to nearly 23% of the cohort aged from 18 to 21 (China Education Yearbook Editorial Board, 2008). In this paper, the

discussion is restricted to the regular institutions that comprise the national public university, local public university and local public college systems.

Instrument and sampling

With respect to the instrument and sampling in the CAP survey in China, a paper survey was undertaken from early 2007 to October 2007 by the Chinese team which was strongly supported by the Ministry of Education (Shen, 2008). The sample of faculty (N=4,200) was selected from 10 national and 60 regional institutions, stratified by region, discipline, and institution type (*e.g.* national or local). The faculty response rate was 86% (N=3,618) and the institution response rate, 97% (N=68). As Table 1 shows, by institution the number of the respondents from national public universities, local public universities and local public colleges was 463, 2,596 and 553 respectively constituting 12.8%, 71.9%, and 15.3% respectively of the total. By academic rank (Table 2) the number of the respondents from professors, associate professors, lecturers, and assistant lecturers were 838, 1,205, 1,008, and 399 respectively corresponding to 24.3%, 34.9%, 29.2%, and 11.6% of the total respectively. By institution, the number and percentage of respondents from local public universities account for the largest group of the total; by academic rank, the number and percentage of associate professors provide the largest segment of the total.

Table 1. Distribution of respondents by institution

	Number	percentage
National Public University	463	12.8%
Local Public University	2,596	71.9%
Local Public College	553	15.3%
Total	3,612	100%

Table 2. Distribution of respondents by academic rank

	Number	percentage
Professor	838	24.3%
Associate professor	1,205	34.9%
Lecturer	1,008	29.2%
Assistant lecturer	399	11.6%
Total	3,450	100%

Characteristics of China's academics: comparative perspectives

This section identifies specific characteristics of China's faculty in comparison with those in Japan and the US before a detailed analysis is made of their teaching and research activities by institution and by academic rank. There are two reasons why a comparative study is made among these three countries. Firstly, both China and Japan are located in East Asia and their academic systems are developed from Western models. Second, since WWII, Japan has implemented its academic reforms by introducing many US ideas and practices. Similarly, since the 1980s, the US academic system has also affected many aspects of the higher education systems in China.

In terms of the time budgets for teaching and research, as shown in Table 3, faculty in China spend the largest proportion of their time on teaching activities, greater than both Japan and US faculty, while spending the least time on service, administration and other academic work. In a major sense, Chinese faculty belong to the most teaching-oriented type among the three countries.

Table 3. Time budgets when classes are in session – proportions of average total time (%)

	China	Japan	US
Teaching	47	40	44
Research	32	33	25
Service	4	8	10
Administration	12	14	16
Other academic activities	4	6	6
Total sample size	3,036	1,343	1,112

Note: CAP, B1 Considering all your professional work, how many hours do you spend in a typical week on each of the following activities?

Table 4. Preferences for teaching or research (%)

Interests:	China	Japan	US
Primarily in teaching	11	5	22
In both, but leaning towards teaching	42	23	34
In both, but leaning towards research	42	57	34
Primarily in research	5	14	10
Total	100	100	100
Total sample size	3,237	1,383	1,145

Note: CAP, B2. "Do your interests lie primarily in teaching or research?

Table 4 indicates that among the three countries, the interests of the Chinese faculty lie primarily in both teaching and research, but lean towards teaching; they have the lowest primary research orientation of the three countries.

As suggested in Table 5, faculty in China spent the largest proportion of their teaching time on undergraduate programs, and the lowest on graduate work at both master's and doctoral programs. There is no difference in time spent on continuing professional education programs (but relevant data is not available in Japan) and in other programs.

Table 5. Distribution of teaching time among academic programs (%)

	China	Japan	US
instruction time in undergraduate programs	81	74	62
instruction time in master programs	13	18	21
instruction time in doctoral programs	1	7	13
instruction time in continuing professional education programs	2	n.a.	2
instruction time in other programs	2	2	2
Total sample size	2,958	1,326	1,112

Note: CAP, C1 "Please indicate the proportion of your teaching responsibilities in the current academic year that are devoted to each level."

Table 6. Emphasis of primary research activities (%)

	China	Japan	US
Basic/theoretical	78	66	50
Applied/practically-oriented	86	69	68
Commercially-oriented/intended for technology transfer	50	22	15
Socially-oriented/intended for the betterment of society	63	31	54
International in scope or orientation	67	47	41
Based in one discipline	27	60	30
Multi-/interdisciplinary	80	53	68
Total sample size	3,164	1,359	933

Note: CAP, D2 "How would you characterize the emphasis or your primary research?"(5-point scale from 1, Very much to 5, Not at all, % responses 1 & 2)

Table 6 shows that faculty in China place the strongest emphasis on applied /practically-oriented research and attach low importance to restricting research to that based on one discipline. In most other aspects they appear to take more positive attitudes than those in the other countries, notably in research that is international in scope or orientation.

In defining scholarship and other concepts relating to the academic profession (Table 7), the views of Chinese faculty diverge somewhat from the views expressed in the other countries. In regard to scholarship, Chinese faculty emphasize original research the least strongly though they share with the others the importance of its application in real-life settings and their obligation to apply their knowledge to problems in society. In common with the other countries, only a minority of respondents would not now seek to become academics, though the proportion in China is double that elsewhere and also not for advising a young person to join the profession.

Table 7. Views on some basic academic and professional issues (%)

	China	Japan	US
Scholarship is best defined as the preparation and presentation of findings on original research	54	77	69
Scholarship includes the application of academic knowledge in real -life settings	82	75	81
This is a poor time for any young person to begin an academic career in my field	39	8	20
If I had it to do over again, I would not become an academic	21	12	10
Teaching and research are hardly compatible with each other	42	51	12
Faculty in my discipline have a professional obligation to apply their knowledge to problems in society	70	65	67
Total sample size	3,544	1,381	1146

Note: CAP, B5 "Please indicate your views on the following issues" (5-point scale from 1, Strongly Agree, to 5 Strongly Disagree (responses 1&2)

Seemingly, in international and comparative perspectives, among the three countries, in terms of the relationship between teaching and research activities Chinese faculty devote more of their time to teaching activities. Among their teaching responsibilities, they spent the largest proportion of time on undergraduate programs. In relation to their research responsibilities, the responses show that, a large proportion was involved in a wide range of research activities, particularly in applied/practically-oriented research and activities concerning commercially-oriented projects and those intended for technology transfer. This matches with their views on the definition of scholarship.

The teaching and research activities of academics in China by institution and academic rank

This section is mainly concerned with the distinguishing characteristics of the teaching and research activities undertaken by faculty in China, analyzed by type of institution and academic rank. With respect to use of time on teaching and research when classes are in session, institutionally, those in national public universities spend the largest proportion of their time on research, while faculty in local public colleges spend a majority of their time on teaching (Table 8). In terms of academic rank, it is professors who spend the most time on research, while the more junior grades devote a majority of time on teaching.

Table 8. Use of time for teaching and research when classes are in session by type of institution and by academic grade

		Teaching	Research	Number
Institution***	National Public University	35%	47%	397
	Local Public University	48%	31%	2,187
	Local Public College	53%	23%	452
Academic rank***	Professor	38%	38%	750
	Associate professor	50%	32%	1,075
	Lecturer	52%	30%	846
	Assistant lecturer	54%	23%	282

Note: CAP B1 "Considering all your professional work, how many hours do you spend in a typical week on each of the following activities? (hours *per* week)
The following symbolism is used in this and subsequent Tables: * $p < 0.5$, ** $p < 0.1$, *** $p < 0.01$

Table 9. Preferences for teaching or research

		Teaching & both but inclined to T	Research & both but inclined to R
institution ***	National Public University	32%	68%
	Local Public University	54%	47%
	Local Public College	69%	31%
	Mean, all institutions	53%	47%
	Total sample size	1,720	1,517
Academic rank***	Professor	41%	59%
	Associate professor	58%	42%
	Lecturer	58%	42%
	Assistant lecturer	56%	44%
	Mean, all grades	54%	47%
	Total sample size	1,665	1,445

Note: CAP, B1 "Do your interests lie primarily in teaching (T) or research (R)?"

In terms of interests in teaching and research, the data in Table 9 suggest that by institution, faculty in national public universities are primarily interested in research, but in local public colleges their interests lie in teaching. Similarly, by academic rank, professors' interests lie primarily in research, while those of associate professors and lecturers lie in teaching.

In relation to the use of teaching time, across all institutional types and all academic ranks faculty spend the largest proportion of their time on teaching at undergraduate level (Table 10). This result is consistent with the characteristics of China's faculty who emphasized the teaching activities most in comparison with the faculty in either Japan or the USA. By academic rank, professors in the national public universities spend a larger proportion of their time on teaching graduate programs than other faculty or those in other types of institution.

Many more master's and doctoral programs are provided in the national public universities in China and most of these institutions are more research-oriented than the other two sectors. The academic system differs from that in the USA, in that in a huge majority of Chinese universities, only full professors with a qualification to supervise doctoral students are allowed to teach and supervise doctoral programs and master programs. In practice, in many cases, associate professors and some lecturers do teach master's and even doctoral programs, though they usually play subordinated roles as members of a supervising team or committee of which a professor is the academic leader.

Table 10. Distribution of teaching time among academic programs by type of institution and by academic grade

		Undergraduate Programs %	Master's Programs %	Doctoral Programs %	Continuing Professional Education Programs %	Other Programs %	Sample size
Institution***	National Public University	62.8	30.0	3.9	1.7	1.4	381
	Local Public University	82.2	12.9	0.9	2.3	1.5	2,134
	Local Public College	90.5	1.4	0.1	3.2	4.8	443
Academic Rank**	Professor	64.7	27.5	3.4	2.0	1.6	744
	Associate professor	81.9	13.6	0.5	2.3	1.6	1,060
	Lecturer	90.4	4.4	0.2	2.6	2.3	800
	Assistant lecturer	93.3	1.3	0.1	2.4	2.9	284

In terms of research emphasis (Table 11), faculty in national public universities place most emphasis on international scope and multi- or

interdisciplinary research, while those in local public universities and colleges are more concerned with applied or commercially-oriented research. By academic rank, both professors and associate professors emphasize basic/ theoretical research while assistant lecturers identify with commercially-oriented research.

Table 11. Emphasis of primary research activities (%)

		Institution				Academic rank				
		National Public University	Local Public University	Local Public College	All institut -ions	Professor	Associate professor	Lecturer	Assistant lecturer	All grades
Basic/ Theoretical	Response* %	84	78	76	78	83	81	75	69	78
	Number	424	2,127	449	3,000	775	1,046	790	287	2,961
								***		
Applied/ Practically -oriented	Response* %	83	87	82	86	86	86	84	85	86
	Number	412	2,165	456	3,033	771	1,058	810	291	2,996
			**					*		
Commercially -oriented/ intended for Technology Transfer	Response* %	39	54	45	50	51	50	49	54	51
	Number	368	1,926	398	2,692	653	932	735	272	2,656
			***							
International in scope or Orientation	Response* %	75	67	61	67	72	69	64	60	67
	Number	383	1,930	401	2,714	679	934	734	270	2,679
			**					**		
Multi-/ interdisciplinary	Response* %	86	80	77	80	84	80	79	79	80
	Number	405	2,053	424	2,882	732	999	772	279	2,845
								***		

Note: CAP, D2 "How would you characterize the emphasis or your primary research?"(5-point scale from 1, Very much to 5, Not at all, % responses 1 & 2)

The responses to most of the various basic academic and professional issues detailed in Table 7 do not vary significantly with either the type of institution or with academic grade. Only views on the statement that "Scholarship is best defined as the preparation and presentation of findings on original research" and on the compatibility of teaching and research show variations that are significant (Tables 12 and 13).

By institution, faculty in the national public universities most strongly agree with the statement on scholarship that emphasizes the importance of original research in their definition of scholarship; further by academic rank, both professors and associate professors are those most likely to agree with the statement.

Table 12. Definition of scholarship

		Strongly agree/ Agree (%)	Neutral (%)	Disagree/ Strongly disagree (%)
Institution**	National Public University	61	21	18
	Local Public University	54	27	19
	Local Public College	48	31	22
	Mean all institutions	54	27	20
	Total sample size	1,855	910	669
Academic Rank*	Professor	60	23	17
	Associate professor	54	27	19
	Lecturer	51	28	22
	Assistant lecturer	50	30	20
	Mean all grades	54	27	19
	Total sample size	1,834	899	656

Note: CAP, B5 "Please indicate your view on the statement that scholarship is best defined as the preparation and presentation of findings on original research" (5-point scale from 1, Strongly Agree, to 5 Strongly Disagree)

Table 13. Compatibility of teaching and research

		Strongly agree/ Agree (%)	Neutral (%)	Disagree/ Strongly disagree (%)
Institution**	National Public University	41	28	31
	Local Public University	43	28	30
	Local Public College	40	28	32
	Mean all institutions	42	28	30
	Total sample size	1,446	951	1,031
Academic Rank*	Professor	34	29	38
	Associate professor	48	25	28
	Lecturer	47	28	25
	Assistant lecturer	36	33	31
	Mean all grades	42	28	30
	Total sample size	1,430	944	1,008

Note: CAP, B5 "Please indicate your view on the statement that teaching and research are hardly compatible with each other" (5-point scale from 1, Strongly Agree, to 5 Strongly Disagree)

The largest group of respondents tend to agree with the statement that "teaching and research are hardly compatible" (Table 13) though a substantial proportion remain neutral on this issue. The views do not vary between institutions but do vary by academic grade. Associate professors and lecturers find greater problems in reconciling the demands of teaching and research than

professors and assistant professors. In comparison with professors, this matches their greater interest in teaching (Table 8) and their greater teaching loads (Table 9).

Discussion and concluding remarks

As discussed earlier, among the three countries, Chinese faculty at all institutions and at all academic ranks spend the largest proportion of their time on teaching, especially at undergraduate level. Though Chinese faculty in the national public universities in particular have been encouraged to carry out research activities in addition to their traditional teaching obligations since the 1990s, their inherent character has not been essentially changed. Compared with US faculty, and especially with Japanese faculty, China's faculty is the most teaching-oriented (Schuster, & Finkelstein, 2006; Arimoto, 2009).

From international and comparative perspectives, China's faculty is characterized as committed to a wide variety of research activities, the exception being single discipline centered research. Compared with US, and particularly with Japanese faculty, they concentrate more on applied and practically-oriented research and on commercially orientated projects or those intended for technology transfer. In part this arises because the largest segment of Chinese faculty insist that it is a professional obligation to apply their knowledge to problems in society.

However, it is worth mentioning that there is a clear division in the character of academic work between the national public universities and the local public colleges in China. The faculty in the national public universities spend a higher proportion of their time on research and they conduct more of their teaching activities at graduate level, while those in the local public colleges spend more of their time on teaching especially at an undergraduate level, and their research tends to be concentrated more on applied or practically-oriented studies. Moreover, by academic rank, professors and associate professors spent more time on research than lecturers and assistant lecturers and they seem to undertake a wider variety of research activities, including applied and practically-oriented research.

Interestingly, compared with those in both national public universities and local public colleges, the role being played by faculty in the local public universities seems to be very diverse and more complex in terms of the relationship between teaching and research activities in particular. It seems possible to assume that a large number of faculty in local public universities are

unable to determine whether their priorities are those of the research-oriented national public universities or those of the teaching-centered local public colleges. It may well be difficult for faculty working in some of these universities to identify a clear preference to locate their interests in either teaching or research.

Finally, a special note should be taken of the responses that indicate that a large proportion of China's faculty admitted that they would not become academics if they had a chance to make a new choice. Furthermore, a large proportion of them also considered that this is a poor time for any young person to begin an academic career in their fields. Apparently, compared with either US faculty or the Japanese academics, China's academics are confronted with more challenges or crises in order to attract young talent to enter an academic career.

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Convergence and Divergence of Teaching and Research Activities in the Japanese Academic Profession

Yusuke Hasegawa* and Naoyuki Ogata**

1. Framework of analysis

Questions about teaching and research in the academic profession are both old and new themes. Analysis of the factors involved require some criteria and definitions.

First is the micro level approach: this considers how the teaching activities of individual faculty are linked with their research activities. At this level, issues include such questions as how they distribute time for teaching and for research at their individual level, to what extent their research activities are reflected in their classes, and whether their research can be advanced through their teaching activities.

Second is the system level approach: this considers the relation between the production system and the transmission system of academic knowledge. Although the distributional structure for education and research funding is an important factor that influences teaching and research activities, this aspect is regarded as limited to the financial level. The system level referred to here reflects, for example, that knowledge is renewed through research activities, reflected in textbooks, and transmitted through teaching activities. In this sense, a teaching system is inseparable from a research system. Even if individual members of faculty do not conduct any research activities but provide only

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teaching activities, at the micro level, they still benefit from the fruits of research through textbooks and academic societies.

Third is the meso level, which is placed between the micro level and the system level. This is the main focus of this report, by exploring how relations between teaching and research can differ according to institutional characteristics and academic disciplines. Teaching and research activity at individual level is influenced by the institutions and academic disciplines that members of faculty belong to. Moreover, although teaching and research are connected in a circle at the system level, the form of the circle may vary according to institutions and academic disciplines.

As indicated above, the issue of integration of teaching and research can be viewed differently according to the approach adopted. It is not a simple question of whether they can or cannot be integrated. This report considers the situation of teaching and research activities in different institutions and academic disciplines[1]. For institutions, we adopt three categories: research universities, national non-research universities, and private non-research universities; for academic disciplines, we use five categories: "humanities and education," "social sciences," "natural sciences," "health sciences," and "others." The analysis is directed at faculty ranked lecturer or higher levels and excludes those who have no assigned classroom teaching.

Figure 1 shows the basic structure of the data. Research universities account for 22.1%, while national non-research universities make up 37.9% and private non-research universities 40.1%. All academic disciplines are distributed in each institutional type, although their proportions vary. In the following Section 2, the time spent on teaching and research is reviewed according to institutional types and academic disciplines. In Section 3, the relation between teaching time and research time is considered, in Section 4, we classify faculty according to the relationships found for teaching and research times, and in Section 5, we use this classification for clarifying how their way of distributing time for teaching and research is related to their actual teaching and research activities.

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[1] Since this analysis deals with teaching time, it refers to the academic discipline of the department that faculty belong to, not the academic disciplines which they acquired by academic study and qualification.

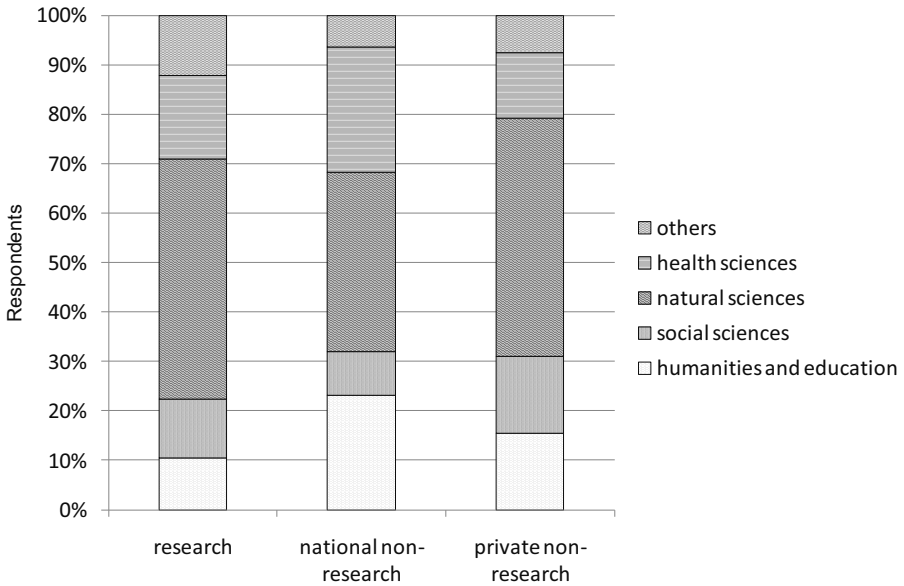


Figure 1. Distribution of academic disciplines according to institutional types

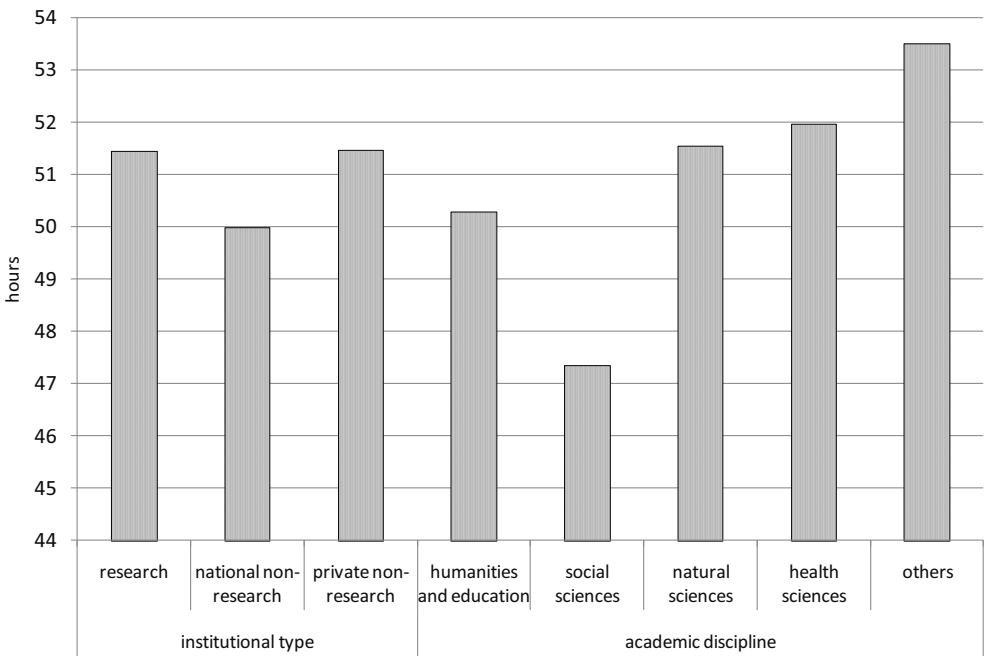


Figure 2. Average working time when classes are in session (hours *per* week)

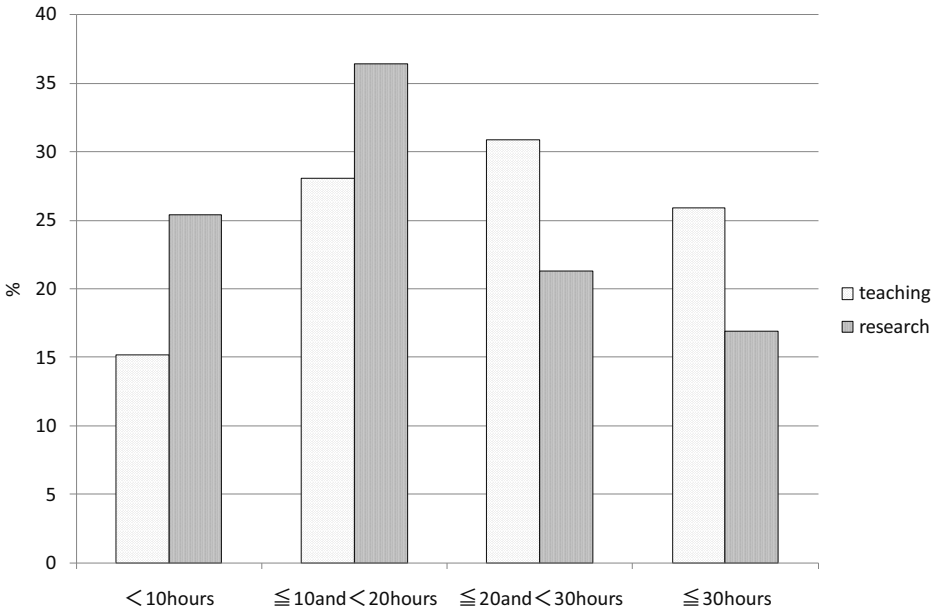


Figure 3. Time spent on teaching and research when classes are in session (hours *per* week)

2. Teaching time and research time by institutional types and academic disciplines

Figure 2 overviews how faculty distribute their total working hours, including the time spent on teaching and research activities. When comparing institutional types, the average working hours *per* week, when classes are in session, are 51.5 at research universities and private non-research universities, and 50.0 at national non-research universities, showing no statistically significant difference. On the other hand, statistically significant differences are observed among academic disciplines: among all academic disciplines except "others", those working in "health sciences" record the longest times, at 52.0 hours, followed by "natural sciences" at 51.6 hours, with "social sciences" the shortest at 47.4 hours.[2]

Figure 3 shows the distribution of teaching time and research time *per* week

[2] With regard to the significance of deviation among individuals, the standard deviation is particularly large at private non-research universities among the institutional types; and in "health sciences" among the academic disciplines.

when classes are in session by categorizing them into four types: "less than 10 hours," "10 to 19 hours," "20-29 hours," and "30 hours or longer." In time used for teaching, there is a peak seen at 20-29 hours (30.9%), although faculty spending 10-19 hours (28.1%) and 30 hours or longer (25.9%) also provide large proportions. As for time spent for research, the largest segment exists at 10-19 hours (36.4%) and the second largest percentage is 9 hours or less (25.4%).

When comparing teaching time by institutional types, faculty at private non-research universities spend the longest time, followed by those at national non-research universities, and then those at research universities (Figure 4). At research universities, the largest proportion of faculty spend 10-19 hours *per* week on teaching, at national non-research universities it is in the range of 20-29 hours, and at private non-research universities it is in the range of 30 or more hours. In contrast, average time used for research is greatest at research universities, followed by national non-research universities, and is least for private non-research universities. For all the three institutional types, the largest proportions of faculty record spending in the range of 10-19 hours *per* week on research, but the proportions at 20 hours or longer are much higher at research universities. On the other hand, the proportions indicating 9 hours or less also stand high at national non-research universities and private non-research universities (Figure 4).

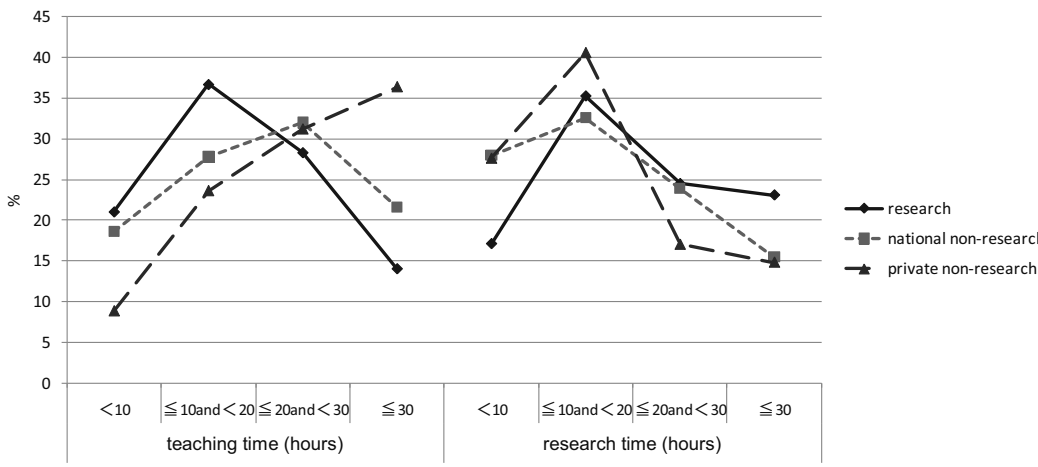


Figure 4. Teaching time and research time when classes are in session, by institutional type (hours *per* week)

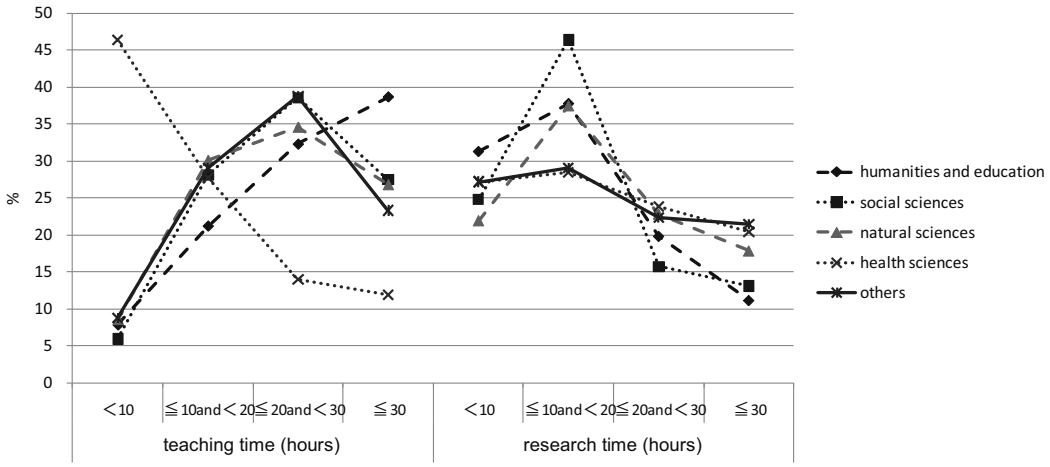


Figure 5. Teaching time and research time when classes are in session, by academic discipline (hours *per* week)

Figure 5 shows data with respect to academic disciplines. For teaching time, "health sciences" shows a peculiar pattern, with a short time for teaching.[3] All the other academic disciplines, except for "humanities and education," indicate a peak at 20-29 hours *per* week. Faculty in the "humanities and education" spend the longest time on teaching. For research, faculty in the "humanities and education," who spend much time on teaching, devote relatively little time to research. Faculty in the "natural sciences" spend a longer time on research than those in "social sciences," and those in "health sciences" longer than those in "natural sciences."

3. The relationship between teaching time and research time

Next, the relations between teaching time and research time are considered from two points of view. First, we compare the differences in teaching time and research time with the respect to total working time. Second, we compare the differences in teaching and research times directly. As in the preceding analyses data refer to the working time *per* week when classes are in session, and especially it is the differences among institutional types that are focused on.

[3] One of the background factors for the "health sciences" is that faculty spend a long time on other activities than teaching and research. The extensive time spent on clinical services is a major factor.

Table 1 shows the results of correlations between teaching/research times and total working time by institutional types and academic disciplines. In order to simplify the analyses, we use the same four ragnes for both teaching time and research time, while classifying total working time into four ranges: "less than 40 hours," "40-49 hours," "50-59 hours," and "more than 59 hours." Necessarily, increases in teaching time and research time lead to increases in total working time. However, an increase in total working time is more strongly driven by an increase in research time than that in teaching time. A possible reason for a stronger linkage between research time and total working time is that the major part of teaching time is devoted to scheduled classes over which faculty have no immediate control. This makes it all the more difficult for faculty to ensure research time by curbing other activities.

Table 1. Correlation (r) between time *per* week spent on teaching or research and total working time

	overall average*	institutional type			academic discipline				
		research	national non-research	private non-research	humanities and education	social sciences	natural sciences	health sciences	others
teaching time	0.35	0.32	0.37	0.38	0.53	0.42	0.41	0.30	0.25
research time	0.47	0.52	0.46	0.45	0.53	0.45	0.44	0.51	0.43

* time *per* week averaged across all types of university and all disciplinary areas

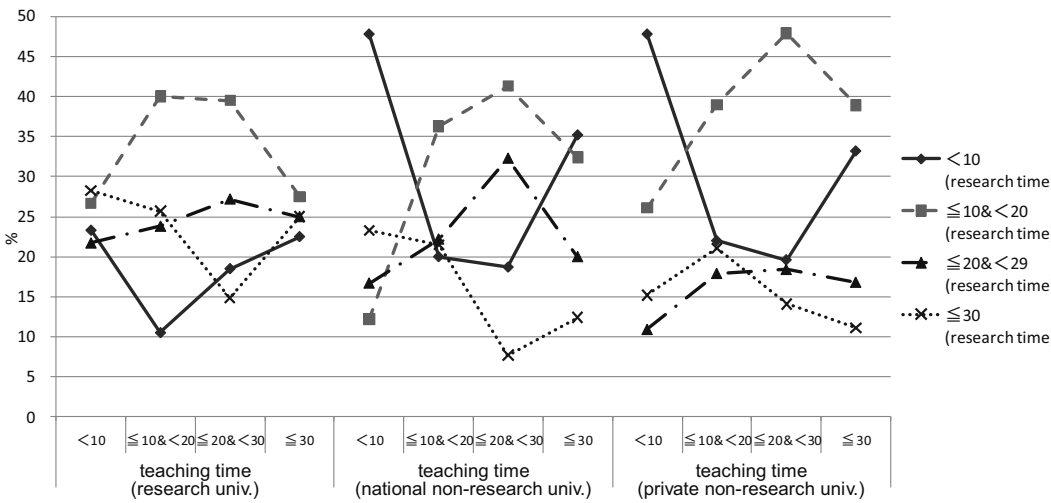


Figure 6. Increase in teaching time and change in research time

However, correlations of these elements differ slightly when examined from the viewpoint of institutional types. Increase in teaching time accompanies greater increases in total working time at private non-research universities and national non-research universities, while for research, time increases correspond to greater increases in total working time at research universities. When comparing academic disciplines, correlations between increases in teaching and research time and increase in total working time are largest in the "humanities and education", though for research a similarly large effect is shown by the "health sciences".

A more detailed study of the relations between teaching time and research time is shown directly in Figure 6 that focuses on differences among institutional types. The relation between teaching and research times is not linear. Several distinctive patterns emerge.

Those who spend a comparatively short time on research at "less than 10 hours" show a concave shape as teaching time increases, that is, some also spend little time teaching while others use the available time to engage in extended teaching. A similar pattern is shown by those devoting 30 or more hours to research, that is, some also devote long hours to teaching while others compensate with a reduced teaching load. The tendency to combine shorter teaching and research times is especially prominent at national non-research universities and private non-research universities. While there are faculty who spend a short time on teaching and a long time on research, there are also some faculty who spend a long time on both teaching and research. This tendency is especially prominent at research universities. At research universities, where more importance is placed on research, the flexibility of research time to changes in teaching time is relatively low. In contrast, at private non-research universities, the group spending more than 29 hours on research shows a convex shape as teaching time increases. At private non-research universities, where they place more importance on teaching, the flexibility of research time to changes in teaching time is high.

4. Classification of faculty by time allocation

(1) Classification of faculty according to teaching time and research time

So far, we have treated teaching time and research time during semesters separately. Now, we divide faculty into six groups by focusing on the time allocations to each activity jointly, while taking the numbers of faculty into consideration as well. For teaching time, we set a median value of 20 hours *per*

week as a level for division so that faculty spending less than 20 hours are classified as the "lower teaching" group, and those spending 20 hours or longer as the "higher teaching" group. For research time, the data suggest that this can conveniently be divided into three groups: a "lower research" group spending less than 10 hours, a "medium research group spending 11-19 hours, and a "higher research" group spending 20 or more hours on research (Figure 7).

It has been pointed out that teaching and research are in a trade-off relationship. The largest group among Japanese faculty is the "teaching higher/research lower" group (26.6%) that spends a long time for teaching but a relatively short time for research. The "teaching lower/research higher" group, which is antithetical to the "teaching higher/research lower" group, accounts for 18.3% of the entire faculty. The "teaching higher/research higher" group (19.8%), which spends a long time for both teaching and research, and the antithetical "teaching lower/research lower" group (16.7%) is of no small significance either. The "research medium" group has the least proportion. As for research time, there is a bipolar tendency.

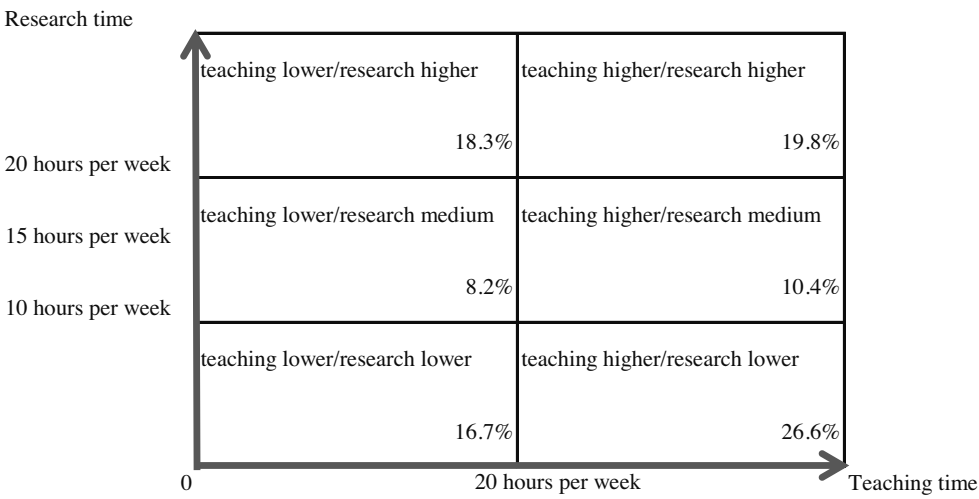


Figure 7. Classification of faculty according to teaching time and research time

(2) Classification of faculty according to institutional types

Table 2 shows the proportions of faculty falling into each of the categories according to institutional types. As already discussed, many faculty at research universities spend a long time on research as do those at the other types of

universities on teaching. Nevertheless, at all the types of institutions all six of the categories of faculty are present to some extent. Therefore, it is not possible to simplify discussion according to institutional characteristics alone.

The "higher teaching/lower research" group, which accounts for the largest proportion of all groups, accounts also for the largest group, 33.9%, at private non-research universities. The proportion of this group is smaller at national non-research universities, and even lower at research universities, although it accounts for 16.4% even at research universities. At research universities too, there is a certain number of faculty who spend a long time on teaching and a shorter time on research. The antithetical "lower teaching/higher research" group is the largest group at research universities, at 28.6%. The proportion is lower at national non-research universities, and even lower at private non-research universities.

Table 2. Distribution of faculty according to institutional types

	teaching lower/ research lower	teaching lower/ research medium	teaching lower/ research higher	teaching higher/ research lower	teaching higher/ research medium	teaching higher/ research higher
Total	16.7%	8.2%	18.3%	26.6%	10.4%	19.8%
research univ.	14.6%	14.6%	28.6%	16.4%	7.0%	18.8%
national non-research univ.	20.4%	6.4%	19.6%	24.7%	9.1%	19.8%
private non-research univ.	14.4%	6.3%	11.5%	33.9%	13.6%	20.3%

The "higher teaching/higher research" group, which spends long times on both teaching and research, represents similar proportions, at around 20%, at all types of universities. The antithetical "lower teaching/lower research" group, which spends a long time on neither teaching nor research, also exists for all types of institution with proportions of around 15%. Of particular interest is that this group accounts for a large proportion of 20.4% at national non-research universities, although it is necessary to note that the proportion of faculty in the field of "health sciences" is high at national non-research universities. Together the two categories of "higher teaching/higher research" and "lower teaching/lower research" have particularly large shares (about one-third): it may be presumed that convergence and divergence in teaching and research activities exist at these universities.

The "medium research" group accounts for a small share in all university

types. The "lower teaching/medium research" group is larger than the "higher teaching/medium research" group at research universities, but the converse applies at private non-research universities.

(3) Classification of faculty according to academic fields

When comparing academic disciplines (Table 3), the "health sciences" group differs largely from the other academic disciplines. In this field, the "lower teaching/lower research" group accounts for approximately one-third, (32.6%) of all faculty, presumably attributable to their clinical duties. Also in "health sciences," there is a high proportion of faculty spending longer on research than teaching, as the proportion of the "teaching lower/research higher" group is almost one-third (31.4%).

Table 3. Distribution of faculty according to academic discipline

	teaching lower/ research lower	teaching lower/ research medium	teaching lower/ research higher	teaching higher/ research lower	teaching higher/ research medium	teaching higher/ research higher
Total	17.1%	8.1%	18.1%	26.4%	10.4%	19.8%
humanities & education	13.8%	6.5%	8.8%	35.9%	12.9%	22.1%
social sciences	14.4%	5.2%	13.7%	35.9%	15.7%	15.0%
natural sciences	12.5%	8.7%	17.4%	27.7%	10.5%	23.2%
health sciences	32.6%	10.2%	31.4%	8.5%	4.7%	12.7%

Among faculty in the three fields other than "health sciences," the majority spends more time on teaching than research. Faculty in the fields of "humanities and education" tend to spend the most time on teaching and those in the "natural sciences" tend to spend the most time on research. Although the most important factor defining teaching time is teaching load (*i.e.*, the number of classes that faculty are in charge of), it is impossible to identify the actual number of classes from the CAP survey. We examine their teaching activities other than classes in the next section, but whether or not a difference in the number of classes according to academic discipline reflects their teaching load will need to be a theme for future analysis.

5. Teaching activities and research activities according to classification of faculty

Differences in time allocation according to institutional types and academic discipline can be related to differences in actual teaching activities and research activities. Therefore, we examine communication with students and development of teaching materials and programs[4] as teaching activities, as analogous to research productivity, the number of articles written in three years, as a measure of research activities.

(1) Teaching activities

a. Differences according to institutional types

The results confirm differences in teaching activities among the institutional types (Figure 8). Both communication with students and development of teaching materials and programs are active at private non-research universities. Since students have become more diversified at private non-research universities than at the other types of universities, it is an increasingly important issue for them to meet such a changing environment and, at the same time, to ensure quality of teaching.

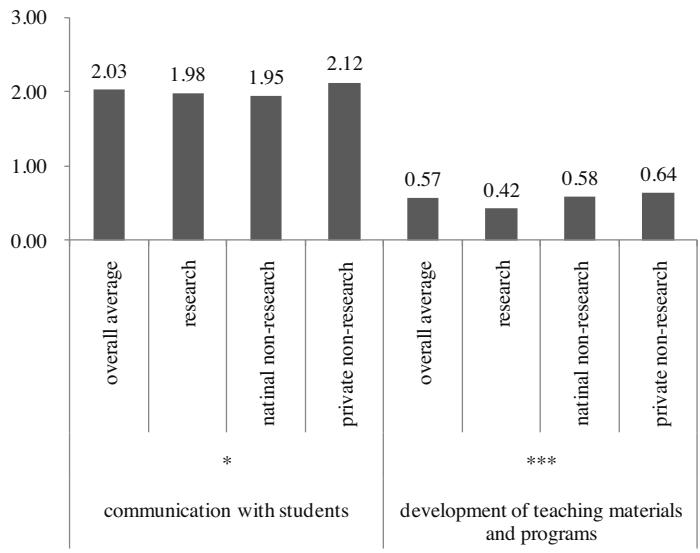
When comparing groups of classified faculty (Figures 9a, 9b), a tendency of differentiation in communication with students is witnessed among faculty at all types of institutions. The longer time faculty spend on teaching, the more they communicate with students. If teaching and research were in a simple "trade-off" relationship, an increase in research time would imply a decrease in communication with students. Actually, however, none of the survey results show that, within the groups of "higher" or "lower teaching", is the amount of communication lowest in the "research higher" group, followed by "research medium" and then "research lower."

In the development of teaching materials and programs, generally speaking, faculty in the "higher teaching" – especially those in "lower research" – category are proactively engaged. For the integration of teaching and research, it is

[4] For communication with students, we asked respondents "Have you been involved in any of the following teaching activities?" and identified three items: "Individualized instruction," "Face-to-face interaction with students outside of class," and "Electronic communication (e-mail) with students." We set "Yes = 1" and "No = 0" for each item and used the total reponse for analysis (minimum = 0, maximum = 3). For the question regarding development of teaching materials and programs, we posed the same question and identified two items: "Development of course material," and "Curriculum/program development." We set "Yes = 1" and "No = 0" for each item and used the total response for analysis (minimum = 0, maximum = 2).

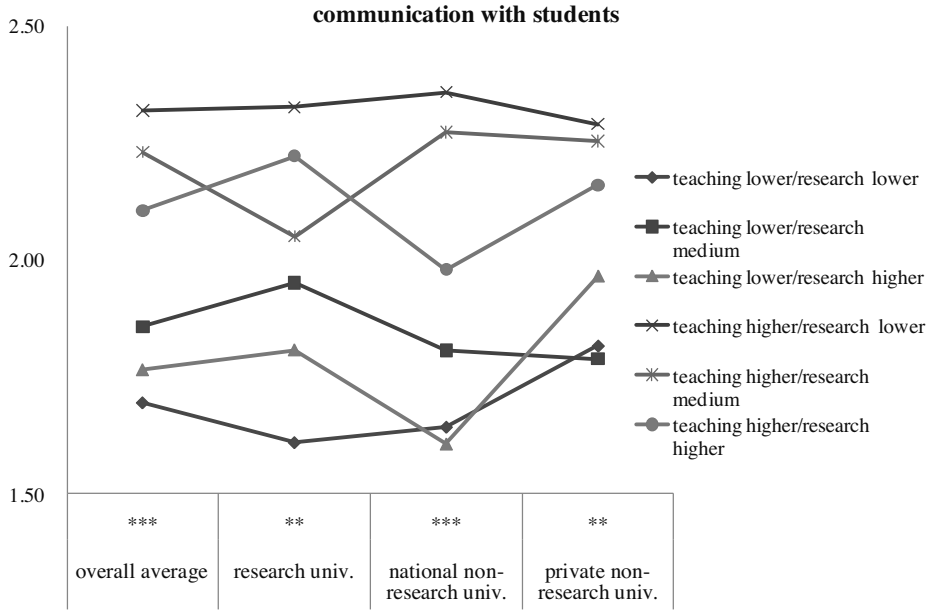
expected that knowledge from research is reflected in what students learn. However, in fact, the longer faculty spend on research, the less proactive they are in the development of teaching materials and programs. At national non-research universities and research universities, even faculty in the "higher teaching/medium research" group are inactive in the development of teaching materials and programs. Therefore, it is not necessarily true that the longer time faculty spend for teaching, the more they are proactive in the development of teaching materials and programs.

Another substantive point is that the amplitude of differences among the groups differs according to institutional types. In comparing groups of similar categories, the differences between the group with the largest average and the group with the smallest average are small for private non-research universities in both communication with students and development of teaching materials and programs. Division of labor in teaching activities exists in all institutions, but all faculty in private non-research universities seem to be much more heavily involved in working proactively on teaching activities than those in other types of universities.



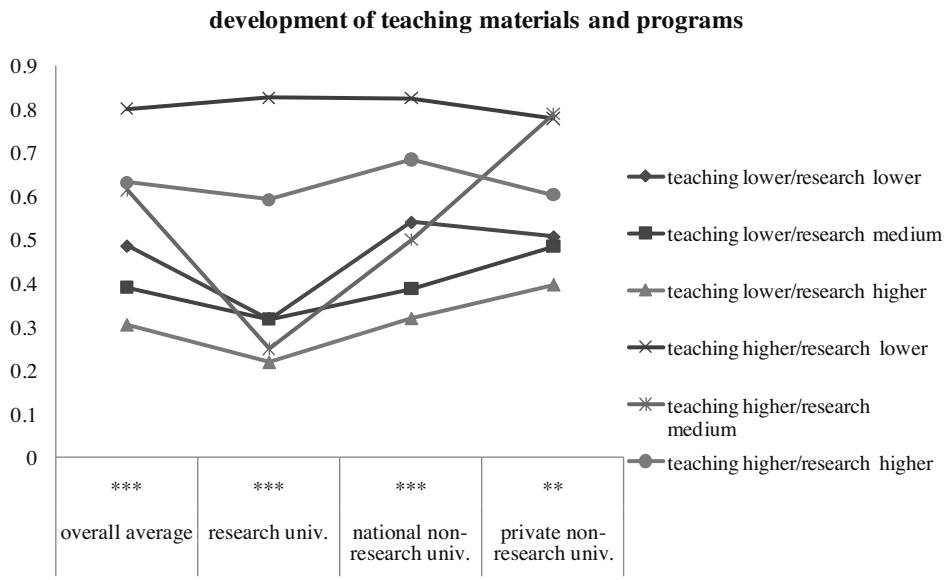
Note: *** p<0.001, ** p<0.01, * p<0.05, ＋ p<0.10
This symbolism is followed in subsequent Figures.
Y-axis indicates average score of each institutional type. For details of the "scores" see footnote 4.

Figure 8. Differences in teaching activities according to institutional types



Note: Y-axis indicates average score of each institutional type.

Figure 9a. Differences in teaching activities among faculty groups according to institutional types



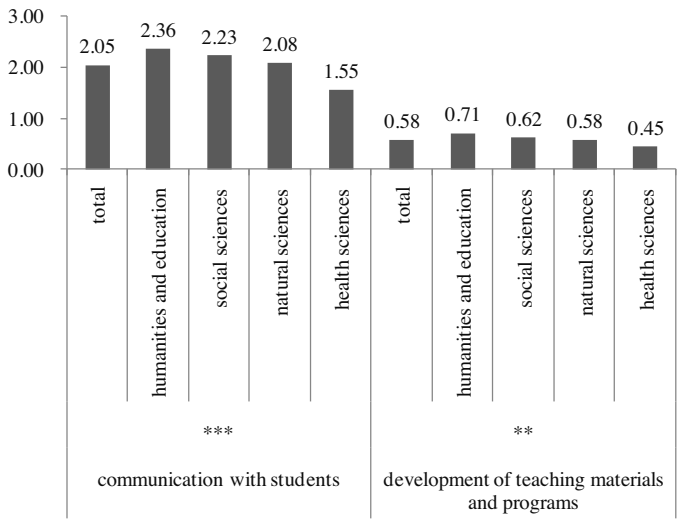
Note: Y-axis indicates average score of each institutional type.

Figure 9b. Differences in teaching activities among faculty groups according to institutional types

b. Differences according to academic discipline

Figure 10 shows differences in teaching activities according to academic discipline. Faculty in both communication with students and development of teaching materials and programs fall into a sequence that diminishes in the order: "humanities and education" > "social sciences" > "natural sciences" > "health sciences." The result is similar to that for the teaching time discussed above: the longer faculty devote to teaching a subject, the more proactive they are in teaching activities.

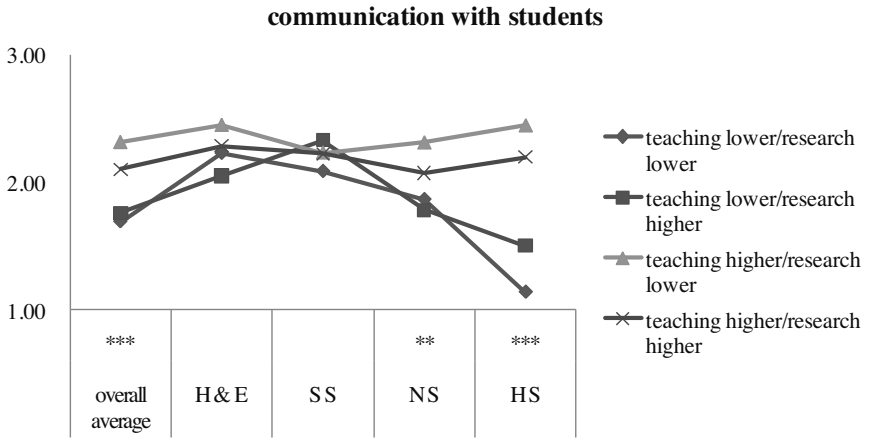
Figures 11a, 11b show the differences among faculty groups.[5] Significant differences are witnessed in the fields of "natural sciences" and "health sciences" for both communication with students and development of teaching materials and programs though for the field of "social sciences" the differences are small. Among faculty's groups the differences are especially large in "health sciences." In the "lower teaching/lower research" group, which probably spends much time on clinical work, the average score for communication with students is extremely low, at 1.14.



Note: Y-axis indicates average score of each institutional type.

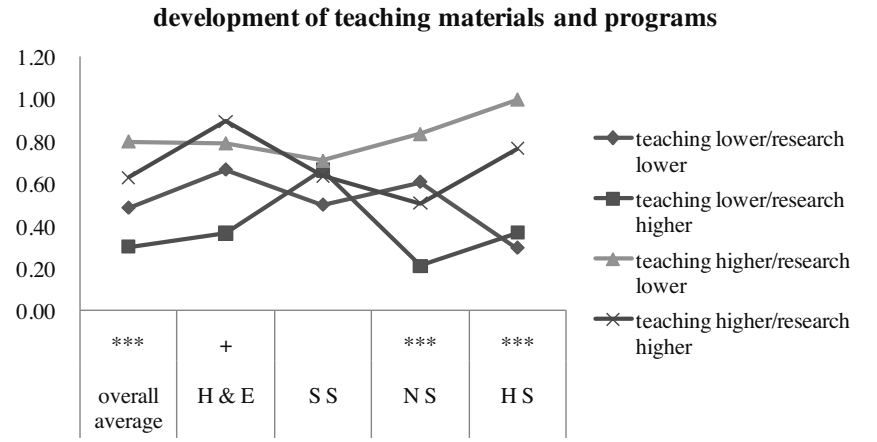
Figure 10. Differences in teaching activities according to academic discipline

[5] The data indicate that in some academic fields the number of teachers belonging to the "medium research" category was extremely small, at around 10. Accordingly this group was excluded from the analysis to avoid distortion of the results.



Note: 'H & E' is 'humanities and education', 'S S' is 'social sciences', 'N S' is 'natural sciences', and 'H S' is 'health sciences'.
Y-axis indicates average score of each faculty group.

Figure 11a. Differences in teaching activities among teacher's groups according to academic discipline



Note: 'H & E' is 'humanities and education', 'S S' is 'social sciences', 'N S' is 'natural sciences', and 'H S' is 'health sciences'.
Y-axis indicates average score of each faculty group.

Figure 11b. Differences in teaching activities among teacher's groups according to academic discipline

(2) Research activities — number of articles

a. Difference according to institutional types

The average number of articles published over the three-year period preceding the survey according to institutional type (Figure 12) is 13.58 at

research universities, 8.61 at national non-research universities and 6.45 at private non-research universities. Clearly faculty at research universities produce substantially more articles than those at non-research universities.

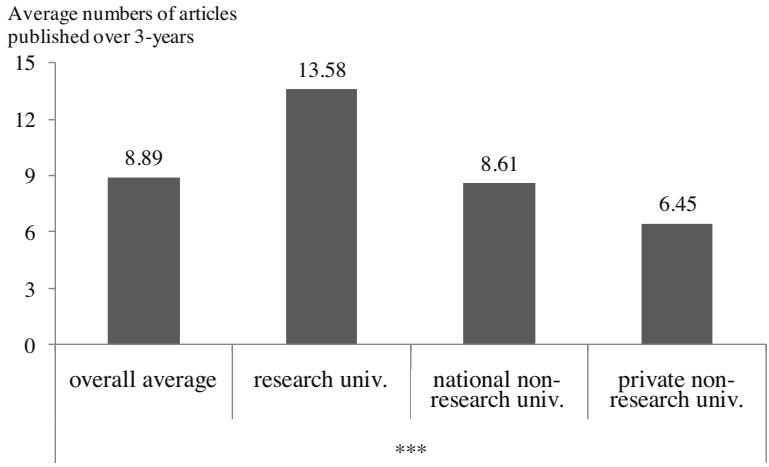


Figure 12. Average number of articles published over 3-years according to institutional type

Figure 13 examines differentiation in research productivity among the categories of faculty groups. Does an increase in research time result in improvement of research productivity? As clearly seen in the results of all institutional types, the longer time faculty spend on research, the higher the productivity of publication becomes. However, the range of research-driven increase is not so great. More important is teaching time. There is a clear gap between the productivity of the "higher teaching" group and that of the "lower teaching" group and the research productivity of the "higher teaching" group is generally lower. Within the "higher teaching" group, the "higher research" group produces barely as many articles as the "lower teaching" group when averaged across all institutional types

A similar tendency is found in the comparison of institutional types. Nevertheless, at research universities and private non-research universities, the "higher research" group produces as many articles regardless of length of teaching time. On the other hand, at national non-research universities, faculty are clearly differentiated according to the length of teaching time. Even those in the "higher research" group are not able to attain high productivity if they belong to the "higher teaching" group. It is noteworthy that faculty at research universities are not necessarily higher in research productivity than those at

national non-research universities and private non-research universities.

Again, the factor differentiating faculty in research productivity is teaching time rather than research time. A message conveyed by universities to their faculty, "to devote more effort to teaching," might have been heard as "it is not necessary to improve research productivity." Faculty at national non-research universities may well have failed to improve their research productivity despite an increase in research time possibly because they are exposed to greater expectations with respect to teaching than faculty at research universities.

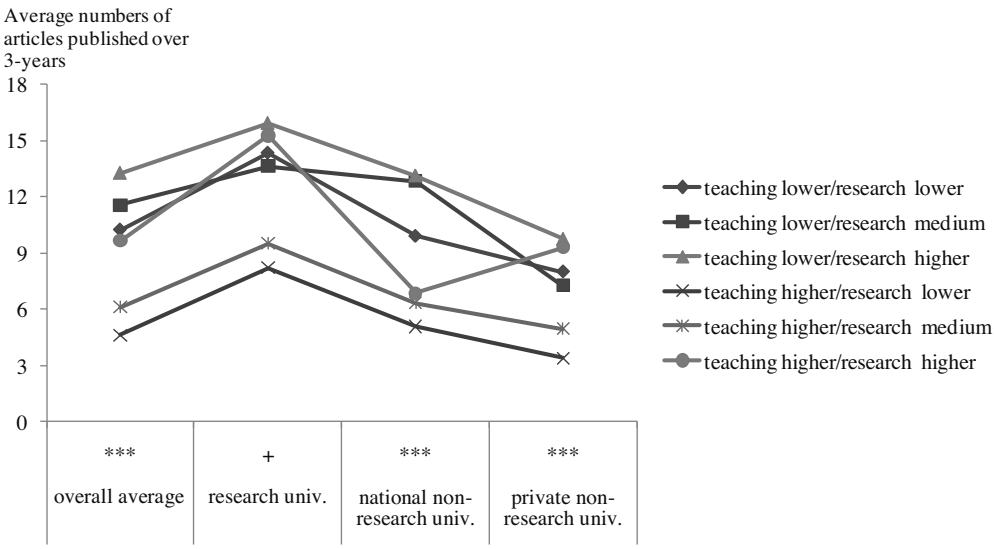


Figure 13. Average numbers of articles published by faculty groups according to institutional types

In this regard, faculty at private non-research universities show an interesting characteristic. Pressure for teaching productivity is highest at private non-research universities, but the research production volume of faculty in the "higher teaching／higher research" group at private non-research universities is as high as those in the "lower teaching lower" group (as in research universities).

One contributory factor may well be this group of faculty's concern for their future careers. Many faculty in Japan studied as researchers at the graduate schools of research universities. In employment, however, especially at private non-research universities, they are often required to spend much time as teachers. Those who seek a research career will inevitably consider moving

to other universities, and especially to research universities. When moving to other universities, research productivity is an important evaluation standard. Therefore, even if they have to spend much time teaching, they will still pursue their research and seek to publish research work. In a survey, faculty at private non-research universities were divided into groups: those who, in the last 5-years, have considered moving to other domestic institutions (such as universities), and those who have not; the responses were compared according to the average numbers of articles they had published (Figure 14). The "higher teaching / higher research" group of those who had considered moving show the highest productivity of articles.

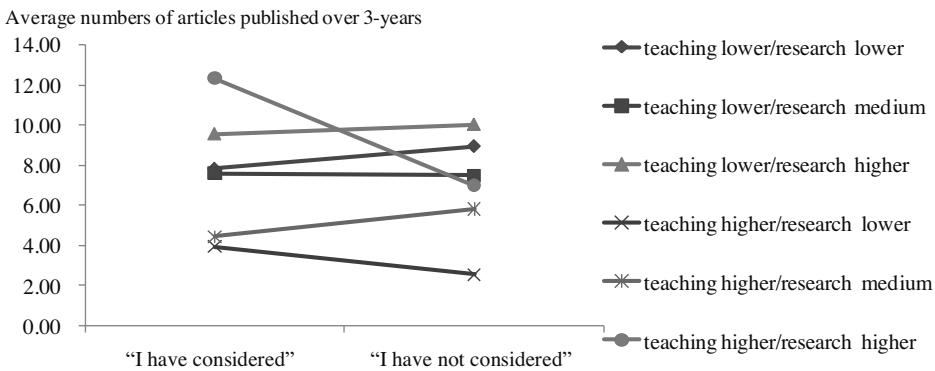


Figure 14. Difference in the average number of articles of faculty at private non-research universities, according to their experiences of considering moving to other universities

b. Differences according to academic discipline

There are wide differences between different disciplines in the numbers of publications (Figure 15). Generally speaking, those in the field of "health sciences" write the largest number of articles (14.36), followed by those in "natural sciences" (9.33), "social sciences" (4.42), and "humanities and education" (3.46). It is though relevant to consider differences in the ways articles are written, namely by single or joint authorship.

As with teaching activities, differences according to faculty groups are especially clear in the fields of "health sciences" and "natural sciences." (Figure 16) In these two disciplinary areas, the research productivity of the "higher teaching / lower research" group is low. In the cases of "humanities and education" and "social sciences," there are no clear differences according to faculty groups, partly perhaps because of their intrinsically low productivity.

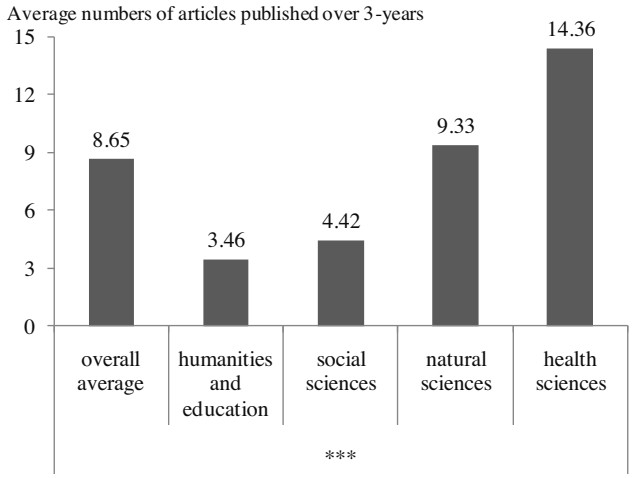


Figure 15. Average number of articles published over a 3-year period by academic discipline

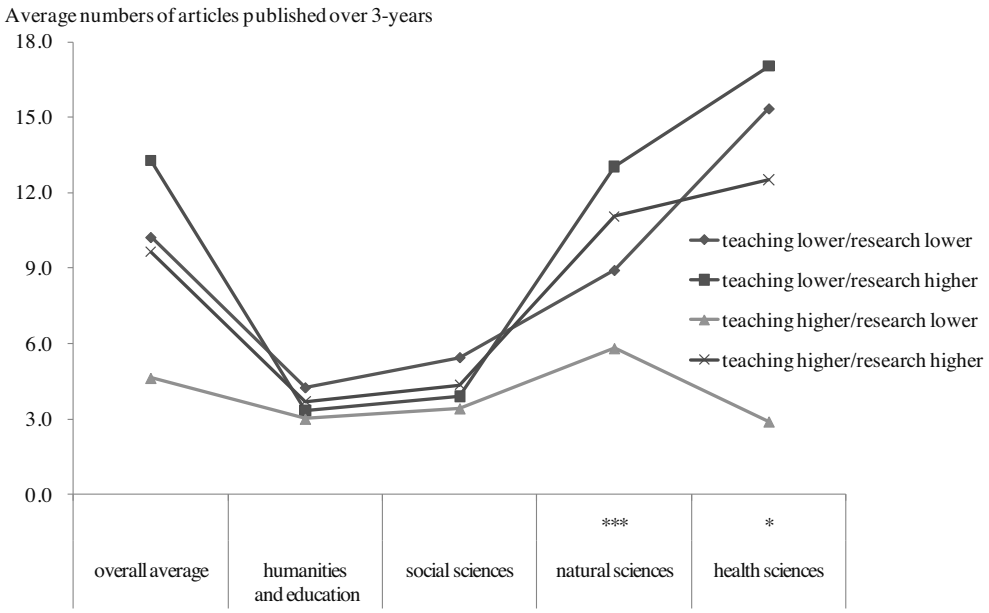


Figure 16. Average number of articles published over a 3-year period by faculty classification and academic discipline

6. Conclusion

It has often been pointed out that faculty in Japan are more oriented toward research than teaching. Although the orientation toward teaching has been stronger these years, there is no significant change in this basic attitude. However in practice, faculty are expected to research more at research universities and to teach at the other types of universities. Irrespective of their preferences, faculty are assigned duties according to the type of university in which they work. Characteristics of their academic activities also vary according to academic disciplines, as seen most clearly in the "health sciences." That is why a particular focus has been given to the time spent for the primary activities of teaching and research.

In fact, faculty at research universities spend much time on research just as those at private non-research universities do on teaching. It is difficult for faculty to control teaching time because classes are scheduled commitments. As a consequence, any increase in research time tends to constitute an addition to an already lengthy total working time. Nevertheless, it is not sufficient to conclude that teaching time is less flexible than research time, because the variation of time devoted to teaching and research activities depends on both the type of institution and the academic discipline. For example, if policy requires faculty to increase time spent on teaching, at private non-research universities, where they already spend more time on teaching than research, it is difficult to increase research time; at research universities, since they cannot cut their research time even if their teaching time increases, the total working time tends to increase.

The above observations might evoke stereotypical images of teaching time and research time by institutional types and academic disciplines. However, in reality, faculty, even in the same institutional type or the same academic discipline, show differing tendencies in distributing time for teaching and research. And this characteristic affects actual teaching activities and research activities. Faculty who spend a longer time on teaching, regardless of the length of time they spend on research, are eager to improve communication with students and to develop improved teaching materials and programs; productivity of research publications is determined not only by the length of research time but also by the length of teaching time. At Japanese universities, one-fifth of faculty spend a considerable time on each of teaching and research at all types of institution; at the peripheries, there are both faculty who spend more time on teaching than on research and also those who spend more time on research than

on teaching. On the supposition that integration of teaching and research is the ideal contemporary model for the academic profession and that a proportion of about one-fifth is appropriate for those that achieve this, it is not necessary to be concerned about the fact that there are many other faculty that conform to differing time allocation in accord with the characteristics of institutional types and academic disciplines. On the other hand, if it is considered that that a proportion of one-fifth is insufficient, the fundamental model for academic profession is at risk or it has already collapsed.

Of course, the discussions provided in this paper have only focused on one dimension of teaching and research, by analyzing mainly the quantitative aspects of teaching and research time. To advance discussion on the integration of and conflict between teaching and research in the academic profession in a productive manner, there is no other way but first to understand the actual state of these activities, and then to raise specific issues in order to examine, and finally solve these problems on a step-by-step basis.

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Teaching and Research in the Japanese Academic Profession: a focus on age and gender

Hideto Fukudome* and Naomi Kimoto**

This paper addresses two issues. The main research interest is how members of the academic profession develop their capacities for teaching and research during their lifelong careers. The first half of this paper is concerned with the influence and the effects of age; the second half deals with the differences arising from gender.

1. The effects of age

In Japanese higher education these days, particularly after the 1990s, faculty development (FD) has become one of the key issues often discussed by policymakers and inside our academic communities. The reason why we often refer to the term 'FD' is that the quality of teaching in our universities is severely questioned. In this context, the term 'FD' usually means the collective activities to enhance teaching in higher education institutions or departments. Though these attempts consist of diverse activities − and some of them are quite significant, generally speaking a viewpoint of the individual 'development' of members of faculty as academic professionals does not draw much attention. The importance of individual faculty's autonomous capacity building may well also be crucial for the reinforcement of academic quality. Further, discussion of faculty's self-development should not be confined to teaching skills: we need to broaden our focus to the whole of academic capacities. The focus of the

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analysis will therefore rest on working conditions and faculty's recognitions of their activities of teaching and research, and also the relationship between them. To clarify the distinctiveness of the Japanese academic profession, international comparisons will be emphasized. Three research questions can be identified.

(1) How do academic professionals develop their capacities for teaching and research during their careers?
(2) How do they share the work between different age cohorts? Are different roles assigned to different age cohorts or not?
(3) What is the distinctiveness of Japanese academic professionals in terms of their capacity development and work assignments from a perspective of international comparison?

In considering these questions, the analysis will address three themes by means of the differing age cohorts for both Japan and other countries.

(1) How do academic professionals spend their working time in regard to teaching, research and administration?
(2) How are academic professionals employed: are they tenured, on fixed-term or other forms of contract?
(3) To what extent do academic professionals think teaching and research are compatible?

For international comparison data for Germany, United Kingdom and the United States will be used, because when we discuss universities' qualities and future development we often consider these countries, which have developed internationally, influential higher education models.

1-1. How do academic professionals spend their time?

Figures 1 through 4 show the working time of each country's faculty during the periods when classes are in session. From them two findings emerge.

- ✓ In Germany, UK and US, young members of faculty, in their 20-30s, spend more time on research than other age cohorts. In these countries, the times spent on teaching and administration start to increase for faculty in their 40s.
- ✓ In Japan, young members of faculty also spend more time on research than other age cohorts, but the difference is not so great. Instead, young

members of faculty spend more time on teaching than other age cohorts, and almost the same amount of time on administration: time distribution between age cohorts is flatter in Japan than in the other three countries.

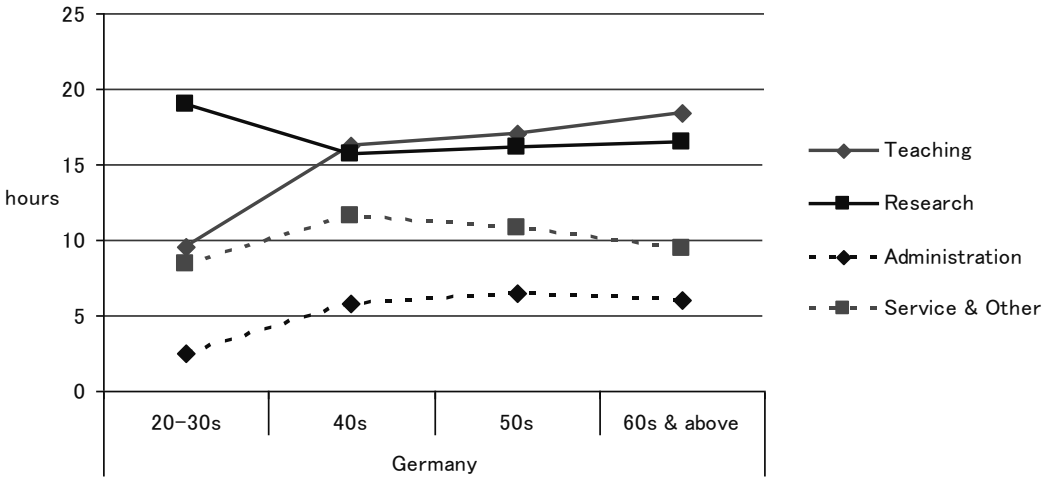


Figure 1. How long do faculty spend on each academic activity (when classes are in session): Germany (hours *per* week)

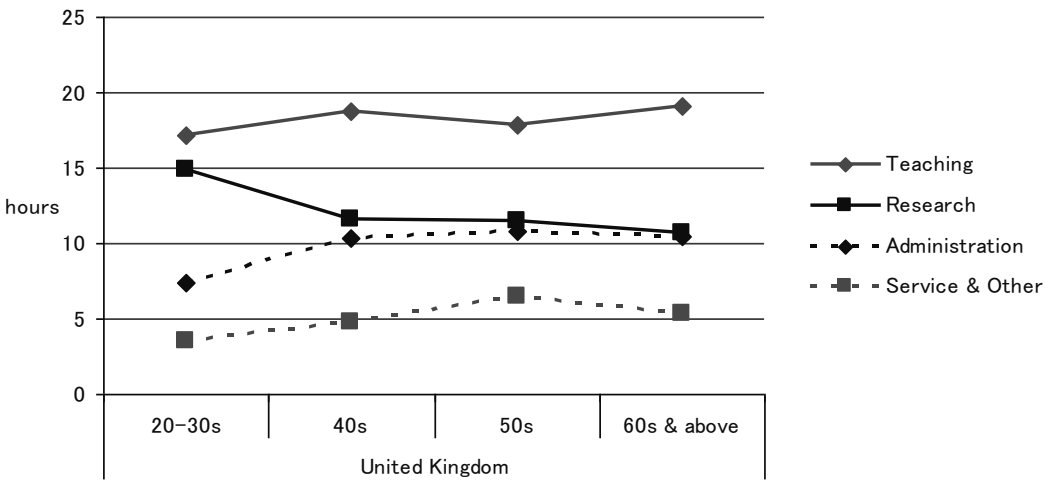


Figure 2. How long do faculty spend on each academic activity (when classes are in session): United Kingdom (hours *per* week)

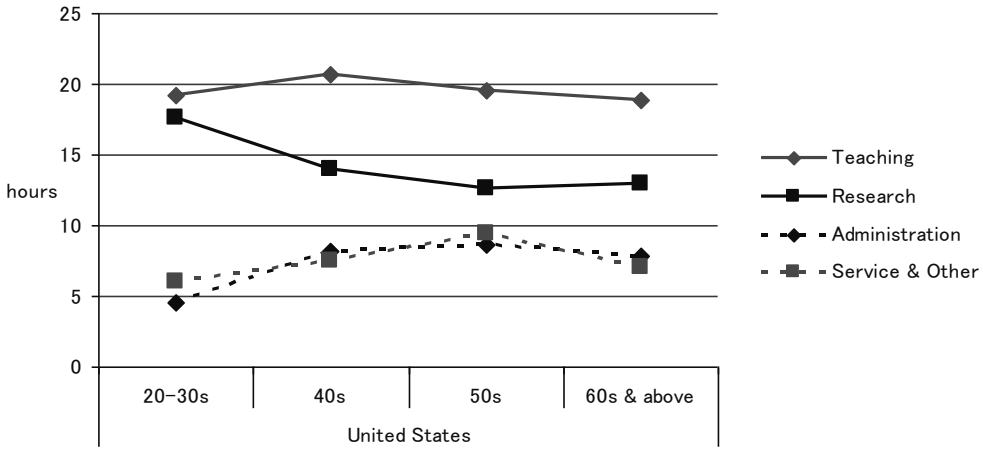


Figure 3. How long do faculty spend on each academic activity (when classes are in session): United States (hours *per* week)

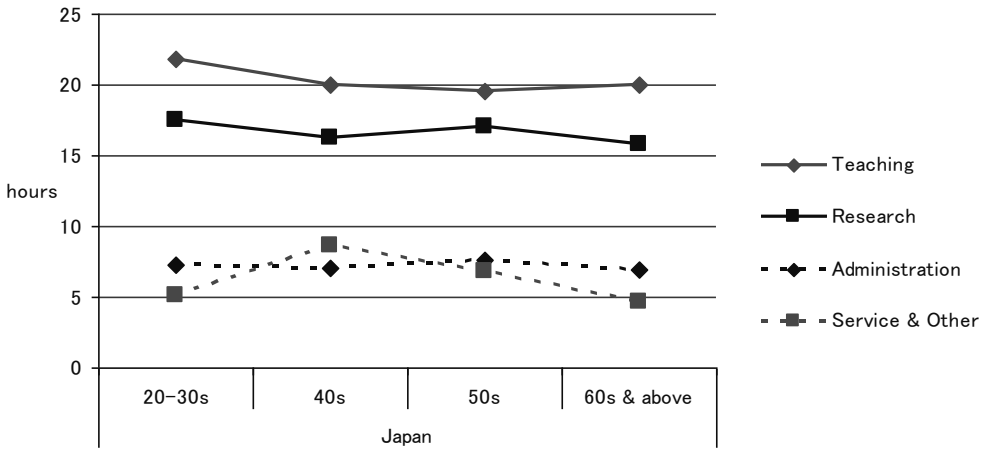


Figure 4. How long do faculty spend on each academic activity (when classes are in session): Japan (hours *per* week)

1-2. How are academic professionals employed?

Academic professionals' employment contracts with higher education institutions or governments define their working conditions and, in many cases, the nature of their work. Figures 5 through 8 show how they are employed in each of the four countries for the different age cohorts. The questionnaire identifies five categories to classify employment contracts: permanently

employed (tenured), continuously employed (no preset term but no guarantee of permanence), fixed-term employment (but prospects of permanent/continuous employment, tenure-track), fixed-term employment (without prospects of permanent/continuous employment), and other (CAP, A11).

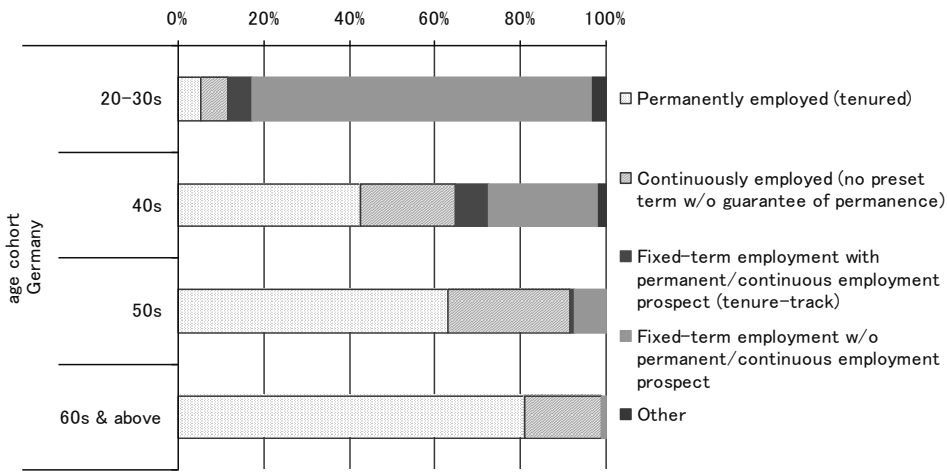


Figure 5. Nature of employment contract: Germany

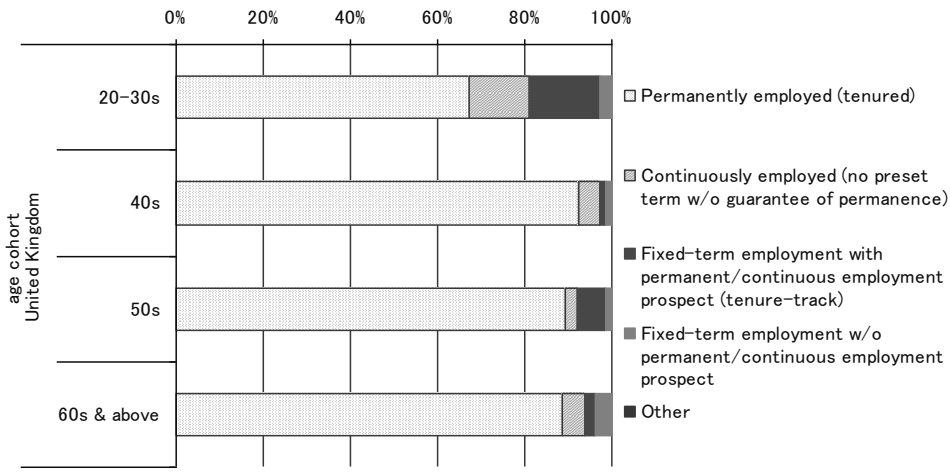


Figure 6. Nature of employment contract: United Kingdom

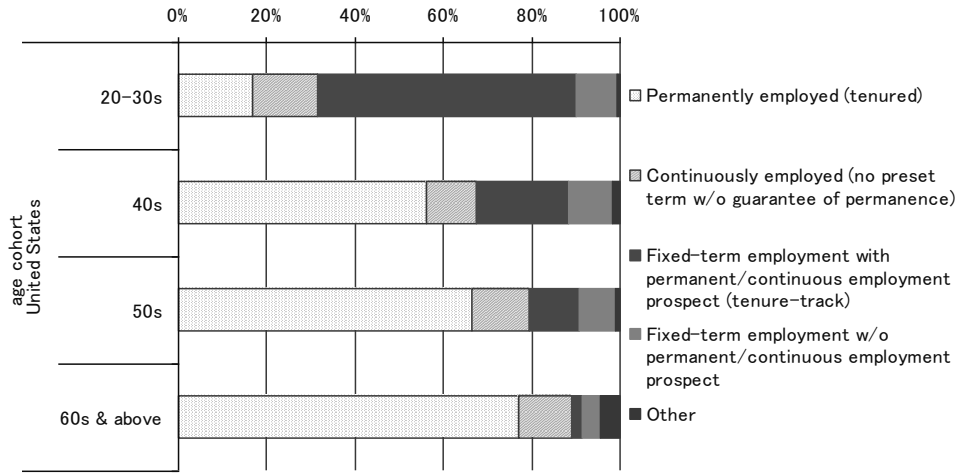


Figure 7. Nature of employment contract: United States

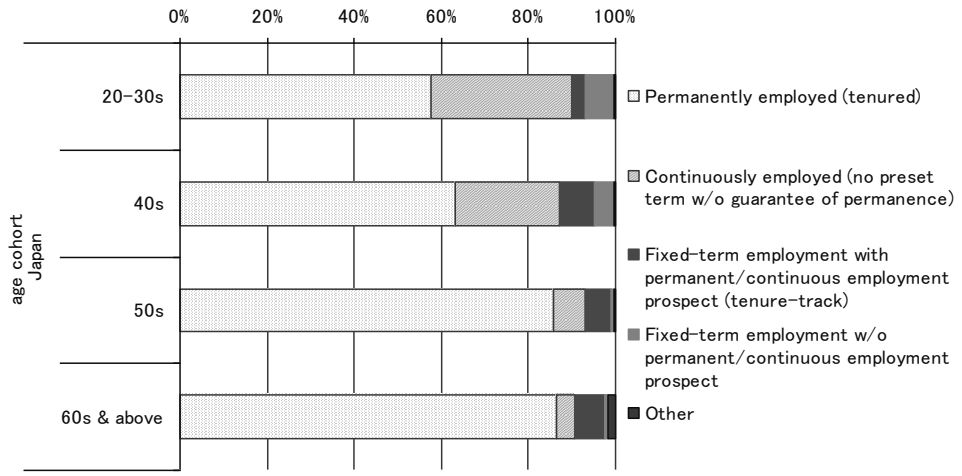


Figure 8. Nature of employment contract: Japan

In Germany and US, young members of faculty, particularly those in their 20-30s are employed on fixed-term contracts. In Germany, many are employed on fixed-term contracts with no permanent or continuous employment prospects. The number who are permanently or continuously employed starts to increase drastically from their 40s. In the US, many young members of faculty are employed on fixed-term contracts that do carry permanent or continuous employment prospects (tenure-track). Tenured appointments start to increase in number for faculty in their 40s. In UK, more faculty is employed permanently even in their 20-30s, but again in their 40s the proportion changes with an

increase in those permanently employed.

In Japan, most faculty are employed permanently or continuously (no preset term without guarantee of permanence) even in their 20-30s. When we put these two categories (permanent or continuous employment) together, the proportions among the various types of contract change little with age. This situation, that many young members of faculty are contractually employed with the same status as their middle-aged and senior colleagues, may be a significant factor in their equal commitment to the same obligations towards teaching and administration.

Employment systems differ between countries, and it is difficult to compare them directly. In the above Figures, those who are employed on part-time contracts are not explicitly excluded because this could tell us something particular about a country's employment system. In Japan, some people, particularly younger academics, are employed part-time to teach a few courses in one or more institutions. However, they were not included as respondents in the CAP survey because they are not recognized as faculty members. In other countries, some part-time faculty were included. So, caution is needed to the extent that the data do not show the whole picture of academic careers, even though they do provide the best available comparison of different employment statuses in different age cohorts.

What is clear is that Japanese academic professionals' working conditions differ from those of the other three countries. They share the same work structures regardless of their ages. Many faculty are guaranteed permanent or at least continuous employment, even at the outset of their careers. It can be said that the Japanese academic world is a flat and stable system, and does not lend itself to much attention to age when we talk about faculty development.

1-3. Teaching & research compatibility

What do members of faculty think about the relationship of teaching and research? This is a critical issue when we discuss the development of academic capacities. Table 1 shows the proportion of faculty in each of the eighteen countries that participated in the CAP survey that think teaching and research are 'hardly' compatible. The proportion of those who think the two academic activities are hardly compatible is highest in Japan. Many factors contribute to this result, and each country has its own complex contexts, so interpreting these results is not simple. However, at least here we are able to perceive some serious problems in terms of the academic work of Japanese faculty.

Table 1. Proportion of faculty agreeing that teaching and research are hardly compatible

Japan	50.8%
China	42.6%
inland	37.0%
Malaysia	30.5%
Germany	31.1%
Australia	26.3%
Portugal	25.8%
Hong Kong	25.8%
United Kingdom	25.5%
South Africa	21.1%
Canada	19.9%
Italy	13.8%
Norway	13.8%
Mexico	12.5%
United States	12.5%
Korea, Republic of	11.3%
Brazil	6.9%
Argentina	6.3%
Overall average	25.8%

Note: Proportion of faculty strongly agreeing or agreeing with the statement that "Teaching and research are hardly compatible with each other" (CAP B5, responses 1 & 2 on 5-point scale from 1, strongly agree, to 5, strongly disagree.

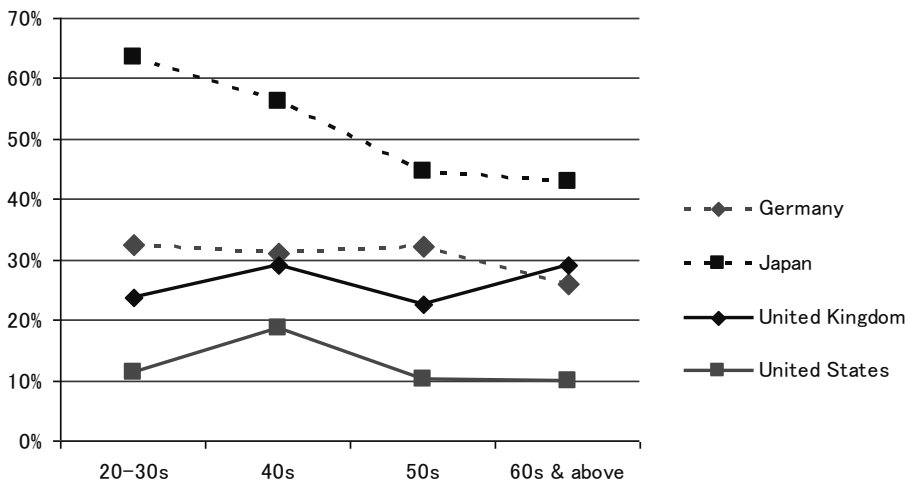
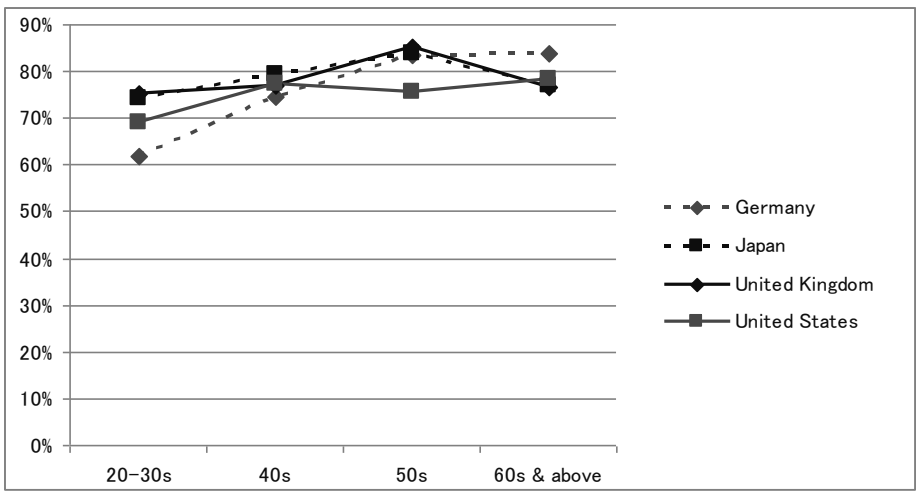


Figure 9. Proportion of faculty agreeing that teaching and research are hardly compatible (see footnote to Table 1)

Figure 9 shows how the proportion of those perceiving incompatibility of teaching and research varies with age in the four countries. The results indicate one aspect of the serious conditions afflicting Japanese academic professionals: it is the youngest faculty that feel the largest difficulty in compatibility. While in all four countries it is senior faculty that feel least incompatibility, but the differences with young faculty are much smaller than in Japan. In UK and US, it is those in their 40s that report larger difficulties than those in their 20-30s: we can guess that this is because, as indicated in Figures 2 and 3, in UK and US those in their 40s start to have teaching loads greater than those in their 20-30s.

Similarly, in Japan the reason why people in their 20-30s tend to think teaching and research hardly compatible is related to their time distribution; that is, they spend even more time on teaching and research than their older colleagues.

However, we can view this circumstance from a different perspective. Though many Japanese faculty experience an onerous situation, requiring great effort in their careers' initial stage, once this is overcome, it becomes easier for them to effectively organize their academic work. Even though the proportions of the middle-aged and senior faculty in Japan who experience tensions are higher than those in other countries, the gap is narrower than that for younger faculty.



Note: Responses indicating agreement or strong agreement with the statement that Your research activities reinforce your teaching (CAP, C4, responses 1 & 2 on a 5-point scale from 1, Strongly agree, to 5, Strongly disagree)

Figure 10. Proportion of faculty agreeing that research reinforces teaching

Tension between teaching and research contains at least two elements: the use of time and the interaction of the subject matter of teaching and research. Figure 10 shows results for this second factor. It shows that many faculty agree that their research activities reinforce their teaching and this applies equally in all four countries and in all age cohorts. Although this relationship is strong in Japan also, the results do not establish whether teaching has an applicable impact on research. From these results, the tensions that young faculty in Japan experience carry a greater impact from the use of time than from any gap of subjects between teaching and research.

Table 2. Proportions of research-oriented faculty

Norway	83.0%
Finland	78.5%
Italy	76.7%
Australia	73.5%
Japan	71.7%
Germany	71.4%
Korea, Republic of	68.0%
Canada	67.6%
United Kingdom	67.5%
Hong Kong	63.1%
Portugal	58.9%
Argentina	57.1%
United States	52.1%
Brazil	51.6%
China	49.7%
Mexico	49.4%
South Africa	46.2%
Malaysia	46.2%
Overall average	63.3%

Note: Responses to the question "Do your interests lie primarily in teaching or in research? (CAP B2 responses indicating interests primarily in research or in both, but leaning towards research)

Table 2 shows the result of a question on the preferences of members of faculty with respect to teaching and research. In answering this question, respondents are asked to identify their primary interest, as either teaching or research or both but inclining towards one or the other. When we see the data in total, Japanese academic professionals' preferences towards research is remarkable even though the percentage of research-oriented faculty has dropped slightly from 72.5%, the response to the same question in 1992, to 71.7% in

2007 (Ehara 1996; Fukudome 2008). However, when the responses are analyzed by age, it appears that for younger faculty the gap between countries becomes closer (Figure 11). In all four countries, young faculty are more research-oriented than middle-aged and senior faculty, and the differences among the four countries almost disappear.

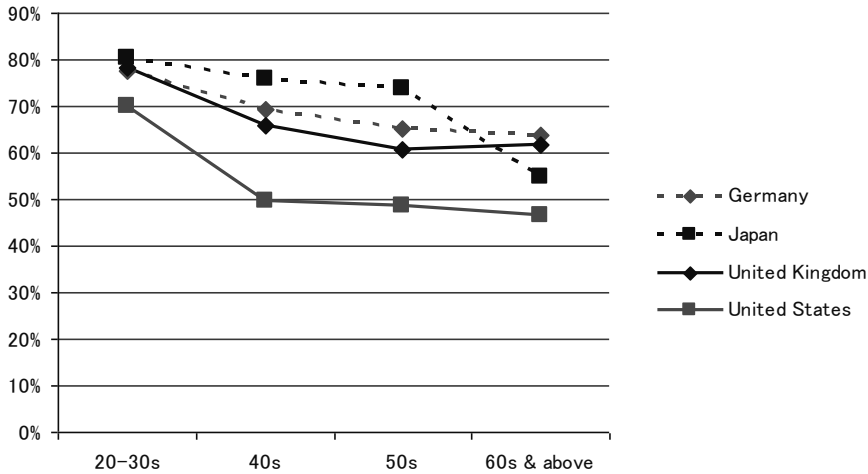
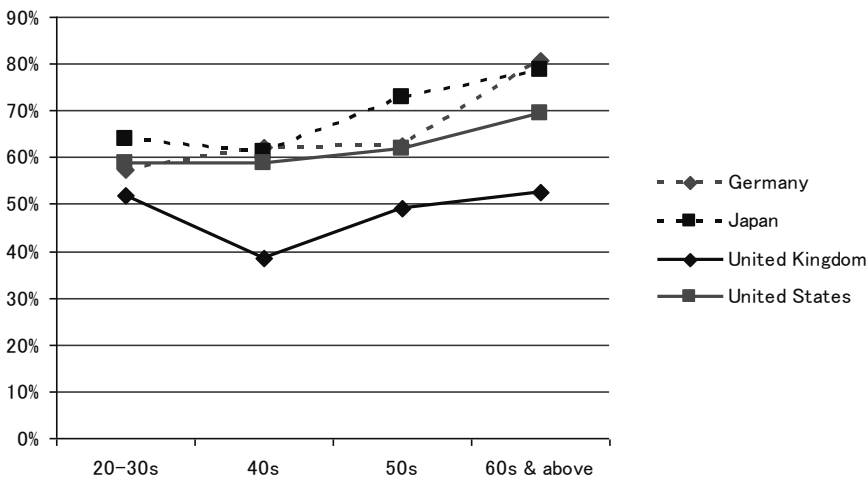


Figure 11. Proportions of research-oriented faculty (see footnote to Table 2)



Note: Responses to the question "How would you rate your overall satisfaction with your current job?" (CAP B6. Answers 1 & 2 on a 5-point scale from 1, very, to 5, very low)

Figure 12. Overall satisfaction with current job

1-4. Conclusions

What appears from the analysis was the effects of a critical trade-off between time distribution and stable employment. In Germany and US, and somewhat in UK, young faculty spend more time in research than teaching and administration. However, their employment conditions are not stable, with many of them on fixed-term contracts though this designation has different implications among countries to some extent. In Japan, in contrast, it is hard for younger faculty to devote themselves initially to research as they are required to spend much time on teaching and administration. This is a consequence of their contracts, which provide stable employment with guaranteed continuing positions.

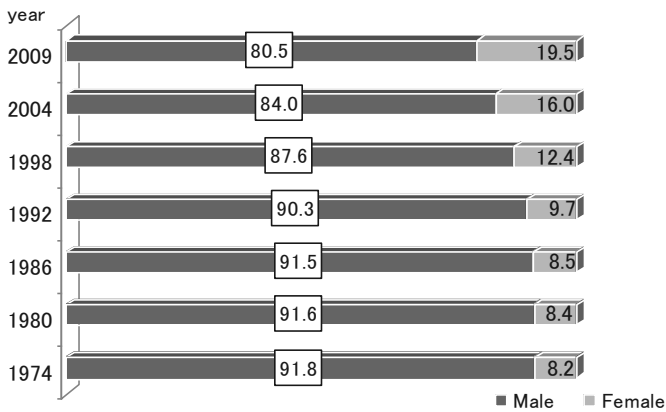
It is difficult to decide which system is better or appropriate for a specific country: many social and cultural factors are relevant. However, the analysis also shows how many academics are satisfied with their current jobs (Figure 12). The proportion of Japanese faculty who are satisfied is high; in total 68.5% of them, the fourth highest in the eighteen countries participating in the CAP survey. In particular, it may be noted, young faculty are satisfied with their current work. These results show "overall satisfaction" and do not indicate specific circumstances such as use-of-time or working schedules; they do though imply that interpreting the data is not simple. What is revealed in the analysis is that the development systems for academic professionals need to accommodate the differences between countries, and may best do so by means of diverse models for faculty development. We should identify appropriate models, identify their purposes and establish how they work. Then it becomes possible to consider how best faculty can use them to develop their own capacities.

2. Gender analysis

Introduction

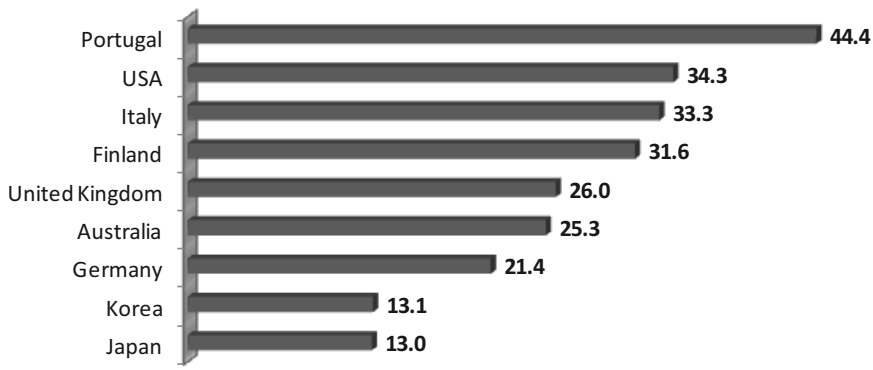
From the Meiji Period to the end of World War II, with very few exceptions, the Imperial University of Japan closed its doors to women. Due to inequalities in academic opportunities, for more than 60 years, only men were allowed to conduct teaching and research activities as members of the academic profession. After the war, most women who took up the academic profession conducted teaching activities in women's higher educational institutions, but generally did not do research. It may be said that women only became fully involved in research activities upon the launch of the new postwar university system (Kimoto 2005).

Although women were allowed to enter universities postwar, there is still a clear gender disparity in the academic profession in the 21st century, and this is the pressing challenge that gender-related policies must address (Kimoto 2008). Figure 13 shows the gender distribution of faculty members in Japan. Since the 1990s, the number of women members of faculty has been increasing at a faster rate. However, as shown in Figure 14, the proportion of female researchers is lower in Japan than in other countries. Moreover, the tendency for female students to choose certain academic disciplines leads to disparities among the distribution of female faculty members among disciplines.



Source: Statistics of Japanese Higher Education 2009

Figure 13. The gender distribution of faculty members in Japan (%)



Source: White Paper on Gender Equality 2009

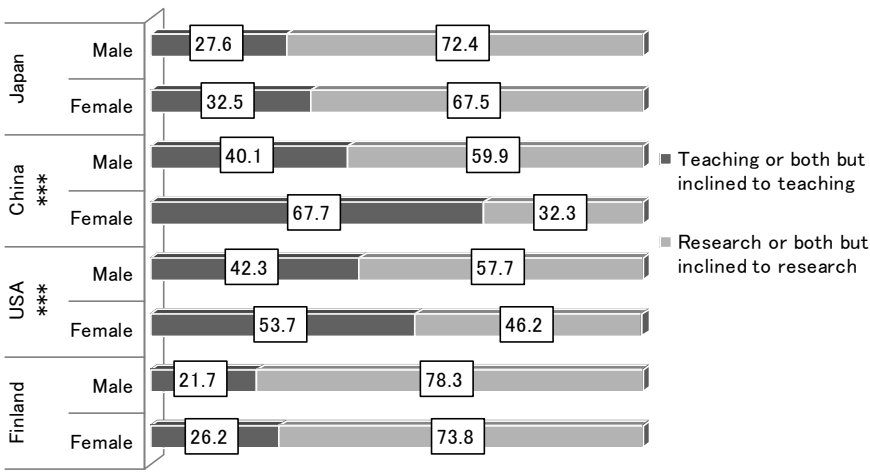
Figure 14. Proportion of woman scientists (%)

As notions of the role of gender vary greatly in the context of the cultures and customs of different nations and their differing social structures, it is important to conduct international comparisons.

This report uses results from the Changing Academic Profession (CAP) survey conducted in 2007 with faculty members from 18 countries as its subjects. The survey provides data for a gender-based comparative analysis[1] of faculty members' activities and opinions on teaching and research activities, thus clarifying the unique characteristics of and challenges to the Japanese academic profession with reference to gender.

2-1. Preferences regarding teaching and research

A 1992 survey, using the Japanese version of the "Carnegie International Survey of the Academic Profession", clarified one key issue: the interest of Japanese faculties is oriented more toward research activities than teaching activities. However, a significant difference was found between males and females ($p < 0.001$): males are oriented more toward research activities than females.



Note: The following symbolism is used in this and subsequent Tables: *** p<0.001, ** p<0.01, * p<0.05

Figure 15. Preferences regarding teaching and research

[1] In this analysis, we only use the data for full-time faculty members.

Results from the 2007 CAP survey for Japan, China, the USA, and Finland are shown in Figure 15. In China and the USA, males showed a stronger preference for research than females, while females were more interested in teaching than research ($p < 0.001$). However, no significant difference was observed between females and males in Japan and Finland, where both males and females were found to show a strong preference for research (males: 72.4%, females: 67.5%). The two surveys conducted in 1992 and 2007 indicate that in the past 15 years, Japanese females have been showing an increasing interest in research.

2-2. Teaching and research activities

Comparison of use of time

To investigate preferences regarding teaching and research activities, the proportions of time spent *per* week on professional activities both for periods when classes were in session and periods when classes were not in session are shown in Figures 16 and 17. A significant difference is found between males and females regarding the proportions of time allotted during periods when classes are in session in China ($p < 0.01$), Japan ($p < 0.001$), and Finland ($p < 0.001$). As shown in Figure 15, the interests of females are closely similar to those of males in Japan and Finland and oriented toward research rather than teaching. However, women in all countries allot more time to teaching activities than men during periods when classes were in session (Figure 16). Relative to the proportion of time spent by male faculty on teaching, that spent by Japanese and Chinese female faculty is highest. A significant difference between males and females regarding the proportion of time allotted to research was found only in China ($p <=0.001$).

On the other hand, teaching activities decrease in all four countries during periods when classes are not in session, and the proportion of time spent on research activities increases (Figure 17). This increase is the highest among Japanese women, for whom the percentage rose by 31.7 percentage points over the figure for periods when classes were in session (26.1%). When these results are compared with those for preferences regarding teaching and research, a number of aspects regarding the Japanese academic profession become clear.

First, during the 15-year period between 1992 and 2007, the interests of women members of faculty increased more in research than teaching. Second, while women faculty continued to spend more time than men on teaching activities during periods when classes were in session, when classes were not in session women devoted more time to research than men. In recent years,

Japanese women faculty have come to hold more interest in research than teaching, but as they are occupied with teaching activities during periods when classes are in session, they are not able to devote as much time as they would wish to research. In order to fill this gap, they devote a substantially greater amount of time to research during periods when classes are not in session, thus achieving a balance between teaching and research activities.

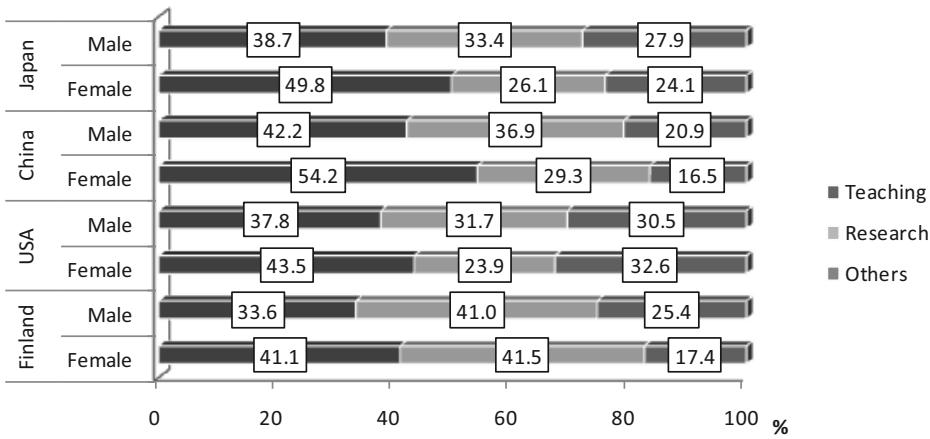


Figure 16. Proportions of time spent *per* week on professional activities (periods when classes are in session)(%)

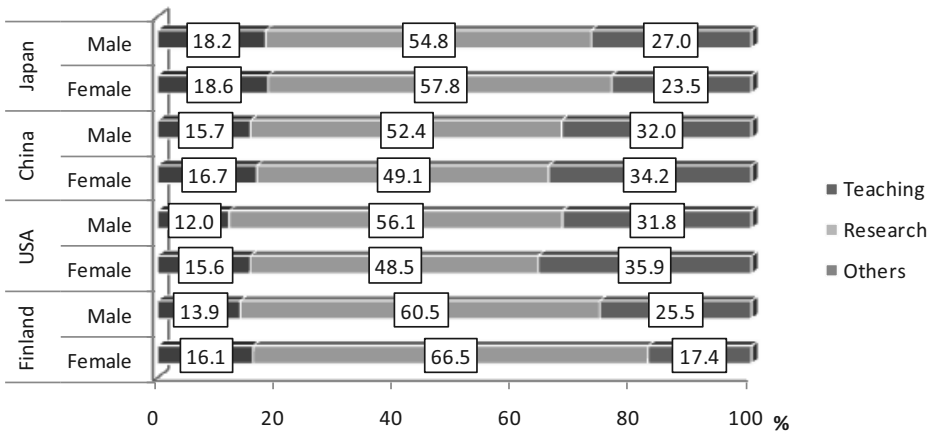


Figure 17. Proportions of time spent *per* week on professional activities (periods when classes are not in session)(%)

Results of research activity

Next, the study examined research productivity among the Japanese academic profession. The proportion[2] of academic papers based upon research activities from the past three years is displayed according to gender in Figure 18. This clarifies three points. First, faculty with 1-5 publications constitute the largest proportion for both men and women. Second, in total, men publish a larger amount of written research results than women ($p < 0.001$). Third, the proportion of women who had produced no publications in the past three years fell from 29.3% in 1992 to 23.3% in 2007.

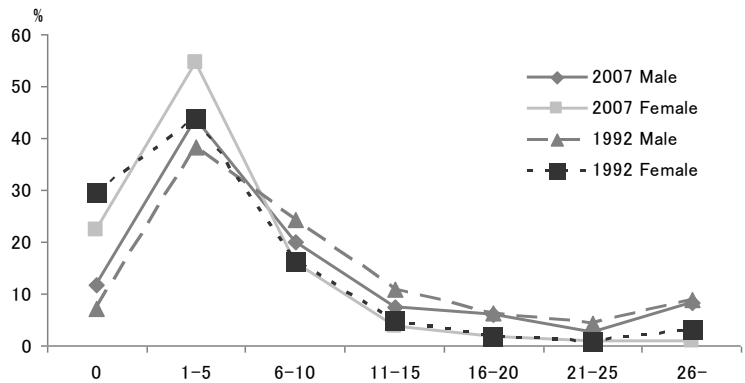


Figure 18. Papers published in an academic book or journal in the previous 3 years

Since research activities include both individual and collaborative research, both with differing costs and rates of productivity, it is necessary to confirm the type of research activity. The results are shown in Table 3. While the type of activity may vary based on the discipline, approximately 50% of studies were conducted by one individual in the case of both Japanese men and women faculty. Approximately 60% of men and women alike engage in collaborative research: in China, US, and Finland, a higher proportion of research was performed collaboratively. Finland and US had particularly large amounts of domestic collaborative research activity. In Finland, the extent of international collaborative studies was also high. Neither men nor women faculty in China and Japan were particularly active in collaborative studies with foreign researchers, with women even less active collaborators than men.

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[2] Research activities also include conference presentations and writing academic books, but here this refers only to the number of academic papers.

In recent years, Japanese higher education policy has encouraged the competitive acquisition of outside funding by universities and members of faculty, and the academic profession has been subject to a certain amount of pressure regarding the acquisition of these funds. The CAP survey asked respondents whether or not the pressure to acquire outside funding had increased since their first appointment. The results are shown in Figure 19. Japanese women registered the most extensive pressure (54.8%). Consequences of the strong commitment of Japanese women faculty are the emphases they have to place on acquiring outside funds and raising their research productivity. The gap between aspiration and reality regarding both teaching and research activities seems to cause substantial psychological stress for women.

Table 3. Collaboration in research

(%)

Country	Gender	Independent		Collaboration research		Collaboration_is domestic		Collaboration_is international	
Japan	Male	51.0		61.9		52.0		24.5	*
	Female	54.7		59.0		47.9		17.1	
China	Male	71.2	***	75.2		40.5	***	16.3	***
	Female	64.6		74.0		32.3		9.2	
USA	Male	73.4		84.5		68.9	*	41.9	*
	Female	72.4		79.3		60.9		34.5	
Finland	Male	13.8		90.8	*	74.6	**	76.8	**
	Female	17.8		86.0		67.7		69.3	

Note: CAP, D1. "How would you characterize your research efforts undertaken during this (or the previous) academic year?." (Yes or No)

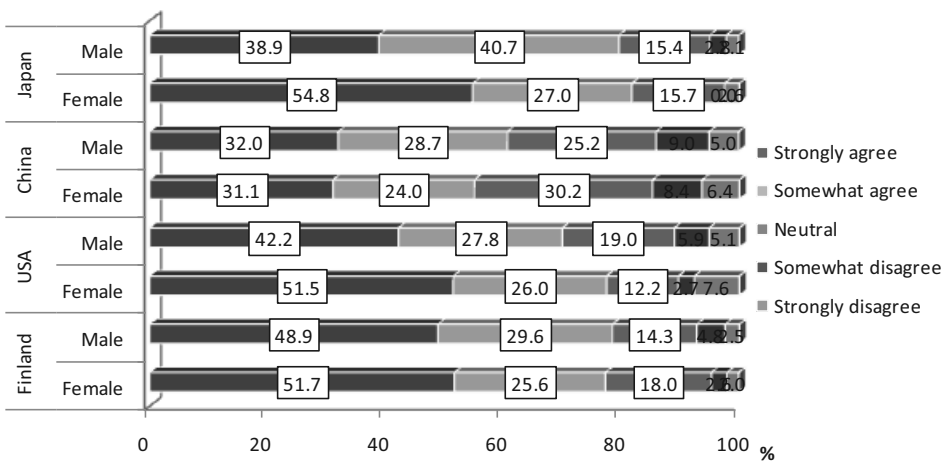


Figure 19. The pressure to raise external research funds has increased since my first appointment

2-3. Compatibility of teaching and research

Teaching and research activities are essential tasks for the academic profession, but compatibility between them presents problems. Answers to the statement, "Teaching and research are hardly compatible with each other." are shown in Table 4. While overall more faculty disagreed than agreed with the statement, a significant difference was found between men and women in all four of the quoted countries. A higher proportion of women than men responded that compatibility between teaching and research was hardly possible. While more women than men agreed with the statement, only in Japan is it by a large majority, 65.5%, that women faculty agreed with the statement.

Also, as seen in Figure 16 and Figure 17, Chinese women, who take a strong interest in teaching and allot most of their time to teaching activities, and American women, who also seem to be strongly oriented toward teaching, both sense more difficulties in the compatibility of teaching and research than do men faculty in their countries. A strong interest in teaching does not permit them to neglect research activities.

Table 4. Compatibility of teaching and research

(%)

Country	Male			Female			
	Strongly agree or Somewhat agree	Neutral	Strongly disagree or Somewhat disagree	Strongly agree or Somewhat agree	Neutral	Strongly disagree or Somewhat disagree	
Japan	49.6	20.5	29.8	65.5	16.8	17.7	**
China	41.3	28.0	30.7	45.0	27.2	27.8	*
USA	9.8	18.1	72.0	17.1	21.9	60.9	**
Finland	33.0	27.6	39.3	43.3	28.4	28.4	***
Overall average (18 countries)	25.8	20.8	53.5	28.0	21.7	50.3	***

Note: CAP, B5. "Please indicate your views on the statement "Teaching and research are hardly compatible with each other." (5-point scale from Strongly agree to Strongly disagree)

2-4 Job satisfaction

The results of the CAP survey indicate that, overall, two-thirds of faculty internationally are satisfied with their current jobs (Table 5). Equally, the proportions of those dissatisfied with their jobs are small averaging about 10% for both men and women. However, when we turn to Japan, the level of dissatisfaction among women is about double the international average at 20.2% and the highest overall. The difference between women and men (12.8%) was 7.4 points, and proportionally 1.6 times more women than men were dissatisfied.

This clear difference in perception among men and women clearly indicates that while equality between men and women is formally assured, it would seem that in practice, there are areas in which this has yet to be achieved.

Table 5. Overall job satisfaction

(%)

Country	Male		Female		
	Very high or Somewhat high	Very low or Somewhat low	Very high or Somewhat high	Very low or Somewhat low	
Japan	69.0	12.8	62.2	20.2	**
China	60.3	13.4	54.7	16.7	
USA	63.1	10.0	62.1	11.4	
Finland	71.3	8.5	66.7	7.6	
Total (18 countries)	66.9	9.2	60.7	10.2	***

Note: CAP, B6. "How would you rate your overall satisfaction with your current job?" (5-point scale from Very high to Very low)

2-5. Conclusions

The results of the comparative analyses regarding teaching, research and job satisfaction in the Japanese academic profession reveal a number of gender-based differences.

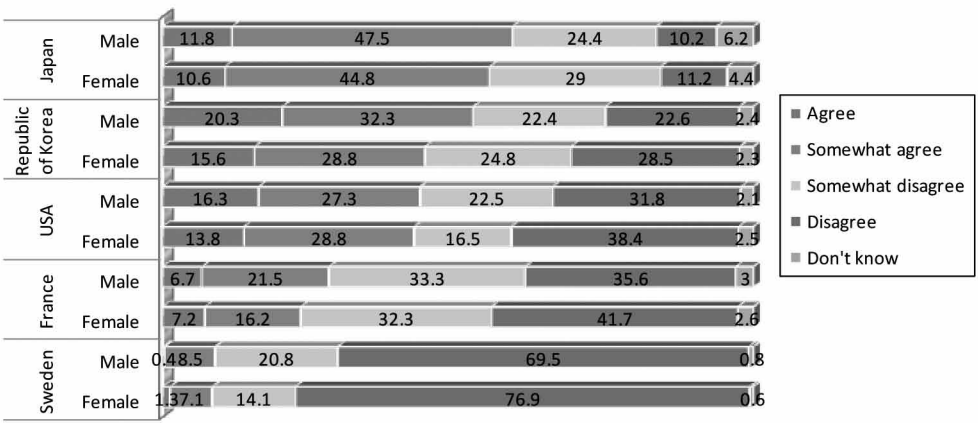
(1) When results from surveys in 1992 and 2007 were compared, it was apparent that men continued to be more interested in research than teaching; over this period though, women, on the other hand, showed a much increased interest in research.
(2) During periods when classes are scheduled, women spent more time on teaching activities than men, but during periods when classes are not scheduled, they spent more time on research activities than men.
(3) Men remain more productive than women with regard to publication of research papers ($p < 0.001$).
(4) Women became more active in publishing research results as academic papers in the 15-year period between 1992 and 2007.
(5) Japanese female faculty members have not formed collaborative research networks abroad.
(6) In common with women faculty in other countries, Japanese women sensed more difficulty in the compatibility of teaching and research than men, but in Japan the difficulty was perceived to be greater than elsewhere

(7) More women than men felt dissatisfied with their current jobs as academic professionals.

The CAP survey demonstrates that in recent years, women's interest in research has risen to the same extent as that of men and that they are putting forth effort to increase research productivity. However, questions remain.

Hitherto, internal institutional concerns have been treated as the primary factors influencing teaching and research in the academic profession, yet the role of family environments and social expectations on the academic profession are also believed to be factors that affect teaching and research. In Japan especially, gender disparities exist within the context of social roles.

Responses from five countries to the statement that "The husband should work outside the home and the woman should keep the house," a survey item in the 2006 "International Opinion Poll Regarding Aging Societies" conducted by the Cabinet Office, are presented in Figure 20.



Source: White Paper on Gender Equality 2009

Figure 20. Responses to the statement, "The husband should work outside the home and the woman should keep the house"

Among the responses from Japan, "Somewhat disagree" and "Disagree" together comprise 34.6% of responses by men and 40.2% of responses by women, the lowest of any country. It can be said that, unlike the West, gender equality in Japan is still a work in progress.

Although Japanese men, broadly speaking, spend most of their time in any given day on either work or leisure, women often also assume responsibility for

housework and childcare. This is one reason why many women sense a dilemma in their academic work and are dissatisfied with the academic profession. There are limits to the notion that women should emulate the working style of males. Elimination of this cause of professional inequality requires social evolution to the extent of equality in the domestic and community roles of both men and women. In particular, increasing the proportion of women involved in the academic profession and creating a fair relationship between men and women as academic professionals depends not only upon the treatment of women in the academic marketplace, but also upon norms regarding household gender roles.

The number of female respondents in the sample used in the CAP study cannot be said to be sufficient (Table 6), and there would perhaps be arguments against generalizing the results of this quantitative analysis. Additionally, there is the problem that the sample was not controlled for either the Carnegie university classification of universities or for academic disciplines. However, the gender disparity in the academic profession is a pressing international problem, not one that affects Japan alone. It must be hoped that those involved in higher education will continue to pursue research in this area.

Table 6. Gender distribution of university faculty, CAP survey 2007

Country	Male(%)	Female(%)	Total(N)	
Japan	91.1	8.9	1,377	
China	63.4	36.6	2,826	
USA	57.9	42.1	791	
Finland	55.1	44.9	888	
Total(%)	64.0	36.0		***
(N)	10,607	5,959	16,566	

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Presenting Malaysian Academics to the World: what's holding us back?

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and Melissa Ng Lee Yen Abdullah[***]

Introduction

This paper will look at the core activities of Malaysian academics based on the Malaysia Changing Academic Profession (CAP) 2006-2007 survey. Academics worldwide have roles to play in their institutions as well as in the disciplines they are trained in and this is also true for Malaysian academics. They are expected to be able to carry out a range of tasks in their academic activities. These include their core activities of research, teaching and administration. For some academics, they form a long list of activities (Lea & Stierer, 2009) that may not necessarily be academic in nature but are focused more on engaging themselves with community services. Arguably, from the very limited available time that they have, Malaysian academics need to focus and concentrate on both academic and non-academic related activities. It is argued here that because of this situation, research and publications have suffered in no small way. The problem is compounded by a general lack of competence in the English language, which limits international exposure and publication possibilities in international refereed journals. Furthermore, Malaysian academics need to demonstrate outstanding contribution in the following categories in order to be promoted to associate professor and full professor: publication, research, teaching, academic recognition, service to the

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university and the community. However, some academics have preference or inclination to perform better in one activity than others. For example, some academics have shown ability in administration and thus have been appointed as administrators in fulfilling their careers as academics.

Administrators in universities have a wide array of roles to play. They need to look after the well-being of the institutions, deal with academic and non-academic staff, and monitor resources and activities such as obtaining funding and support from various parties both internal and external to the institutions. Moreover, administrators need to be able to motivate staff and communicate with them; create an appropriate working environment, plan strategically for the institutions by interpreting the current scenarios and also by lobbying the government for extra funding especially with the recent financial crisis that has crippled the world economy.

Furthermore, higher education institutions in Malaysia have been under pressure to increase intake from both local and international students and at the same time to improve the quality to conform to international standards (Morshidi, 2008). Higher education institutions in Malaysia are also undergoing rapid change due to the combined effects of internationalization of higher education, the Malaysian Qualification Framework to ensure quality, and pressures to lower costs. Thus, administrators in Malaysia have been placed in a very challenging working environment that requires not only commitment but also passion as administrators and managers in the institutions.

Some academics in Malaysia have shown their passion towards teaching. They will spend many hours preparing for and updating materials to be used in their teaching. Students have enjoyed their teaching because of their commitment to it. In other words, they have shown teaching excellence. However, this group of lecturers is normally not rewarded accordingly. Their extra effort in teaching means they are sacrificing their chances of promotion. This suggests a lack of parity of teaching roles in relation to administrative and research roles (Hannon & Silver, 2000). Perhaps, this also manifests the low status of teaching as compared to research and administrative roles. However Gibbs (1995) found that 12% of promotions were being made on the basis of excellence in teaching while 38% of institutions made no such promotions.

Malaysian academics who excel in research are rewarded accordingly and to some extent a few who achieve excellence in research have been promoted to full professorships at a young age. However, many academics are not competent to write in the English language and this hinders their ability to publish articles in refereed international journals. Only a small proportion –

and these mostly senior academics – has sufficient flair and confidence in writing research articles in English and in applying for international research grants. As a result, Malaysian academics in general have limited exposure in the international arena. This poses a major challenge to raising the research activities and output of academics in the international scene.

This paper thus will look into all these three main activities of academics. Based on the evidence captured from the CAP survey, the authors have chosen to consider the following categories of Malaysian academics: researchers, teachers, and administrators or managers. In short, this paper will highlight the involvement of Malaysian academics in and their inclination towards all these activities.

To do so, answers to the following questions will be sought.

- To what extent do Malaysian academics spend time on research, teaching and administrative activities?
- What are Malaysian academics' inclinations in terms of teaching and research?
- What are Malaysian academics' views on scholarship, teaching and research?

Methodology

This article is based on a study that looks at the changes in the academic profession worldwide. Altogether 22 countries were involved in this study using a common research methodology making it possible for cross-national comparisons. Nevertheless, some degree of flexibility is built into the survey design to accommodate the distinctive differences that exist between nations.

The questionnaire comprises six sections capturing issues such as the general work situation and environment, teaching, research, professional career history and personal information. The items used were agreed upon by all the 22 countries taking part in this global study but included minor modifications for the Malaysian context. In Malaysia, the questionnaire was developed in two languages: English and bahasa Malaysia, the Malaysian national language, by using a back-to-back translation technique. The two sets of questionnaire were pilot tested in one public higher education institution in the country before they were distributed to the various higher education institutions.

Academics serving in higher education institutions (HEIs) in Malaysia form the target population of the study. All the HEIs selected offer education at degree level and above. Most are classified as universities with a few as

university colleges by the Ministry of Higher Education. At the time of study, there were 18 public HEIs and 16 private HEIs. However in this study, only 17 public HEIs and 9 private HEIs were selected. The others were excluded as they were only recently established and thus lacking the required data. Secondary data pertaining to the number of academics, classified by their academic rank as well as their discipline were then identified based on input from the participating HEIs as well as from the Ministry of Higher Education. This exercise was able to identify a total of 13,546 academics serving in the HEIs.

The effective sample size which was agreed upon by the coordinating body of the study is 800 respondents. To achieve the effective sample size, a gross sample of 4,000 respondents was required targeting a 40% response rate. This number was then distributed proportionately in terms of academic rank and discipline within each HEI, as displayed in Table 1. To obtain the final number of respondents within each cell at each HEI, a systematic random sampling design with a single random start was employed.

Table 1. Sample sizes (by discipline, academic rank and type of institution)

SAMPLE SIZE	Public HEIs			Private HEIs			TOTAL
DISCIPLINE	Professor	Associate Professor	Lecturer & others	Professor	Associate Professor	Lecturer & others	
Medical	66	96	363	14	17	38	594
Engineering	61	139	628	10	22	106	966
Science	105	239	773	4	22	70	1,213
Arts	78	176	930	3	19	135	1,341
TOTAL	310	650	2,694	31	80	349	4,114

Table 2. Final sample (responses)

SAMPLE SIZE	Public HEIs			Private HEIs			TOTAL
DISCIPLINE	Professor	Associate Professor	Lecturer & others	Professor	Associate Professor	Lecturer & others	
Medical	13	17	41	1	2	17	91
Engineering	6	34	127	4	20	79	270
Science	25	34	100	4	6	54	223
Arts	12	43	231	2	7	94	389
TOTAL	**56**	**128**	**499**	**11**	**35**	**244**	**973**

A total of 1,176 academics responded. However 203 of them did not identify one of the three designated categories and were therefore excluded. Table 2 shows the composition of the final sample.

The total number of responses was 1,176 giving a response rate of 28.6%, whilst the response rate for each of the cells in the above categorization varies from a low of 8.2% for engineering professors in public HEIs to a high of 95.5% for associate professors of engineering in private HEIs. The overall response rate (that could be categorized) was 23.7%, which represents a higher percentage than is typical of most surveys in Malaysia.

To conduct the survey, the Ministry of Higher Education informed the participating HEIs of the impending survey. A resident official in each of the participating HEIs was appointed as the project field official (some of them were members of the project team) and remunerated accordingly. These officials were invited to a one-day workshop that provided briefing of the rationale of the study, the content of the questionnaire, the identification of the respondents, the data collection procedure and other administrative matters related to the distribution and collection of the questionnaires. A two-month period was scheduled for the purposes of data collection.

In addition to the questionnaire the Malaysian team employed focus group interviews in order to obtain more comprehensive and in-depth data and as a way to support and triangulate the findings from the quantitative survey. In this regard, Silverman (2000, p.50) states using multiple methods in a research design helps to "give a fuller picture and addresses many different aspects of phenomena".

The interviewees comprising academics from public and private HEIs in Malaysia were divided into two groups. One group comprising 11 academics discussed issues pertaining to work situations, whereas the other, comprising 15 academics, discussed issues pertaining to teaching and research. The interviews lasted for about two hours. All of the academics gave permission to audio-record the interviews. The researchers transcribed the recordings and then performed content analysis to provide detailed descriptions. Findings based on the focus group interviews were able to confirm and enrich findings from the survey.

Results and discussion

Time spent by Malaysian academics on academic activities

Academics are required to perform various academic activities. The major

ones are teaching, research, administration and service. The study reveals that most academics spend less than 10 hours *per* week on each of these activities both when classes are in session and when classes are not in session. The only exception is teaching. A majority, it was found, spend between 11-20 hours *per* week performing teaching activities when classes are in session; when classes are not in session, as in other academic activities, the majority of academics of all ranks spend less than 10 hours *per* week on teaching. This confirms that academics in Malaysia engage in various academic activities throughout the academic year, regardless of their academic rank.

When the results are converted to means, a clearer pattern as to the amount of time spent for each academic activity emerges, as shown in Table 3.

Table 3. Time spent on academic activities (hours *per* week)

ACTIVITY	In session	Not in session
	Mean (sd.)	Mean (sd.)
Teaching	18.74 (11.51)	10.05 (8.96)
Research	8.87 (7.28)	14.00 (11.64)
Administration	8.16 (7.59)	10.07 (9.50)
Service	4.76 (6.12)	5.57 (7.23)
Other academic activities	4.14 (4.66)	4.85 (5.26)

The table reveals that teaching is the dominant function in Malaysian universities, followed by research, administration, service and other academic activities. However, when classes are not in session, more hours are spent on research and other academic activities. It is interesting to note that even when classes are not in session, academics still spend time on teaching work (mean hours spent: 10.05).

The study also made comparisons between academics in public universities and private universities regarding the time spent on the various academic activities. The study found no significant difference between academics in the two types of universities. In both public and private universities, when classes are in session, a majority of academics spends less than 10 hours on each of the various activities, except for teaching on which a majority in both types spends between 11-20 hours *per* week. Interestingly, when classes are not in session, a majority in both types of universities still spend less than 10 hours on each of the various academic activities, though the proportions in both types of universities who spend less than 10 hours *per* week on each of the various activities decreases a little.

The study also compared respondents from research (RU) and non-research universities (non-RU). It was found that there is no significant difference between the academics from RU and those from non- RU either when classes are or are not in session. When classes are in session, majorities in both RUs and non-RUs spend less than 10 hours *per* week on each of the various activities, except for teaching on which majorities spend between 10-20 hours per week. When classes are not in session, interestingly majorities in both RUs and non-RUs still spend less than 10 hours *per* week on each of the various activities. This appears to show that RU status does not necessarily mean greater expenditure of time on research. It also shows that, despite having the status of RUs, teaching is still a dominant activity.

To shed some light on the quantitative findings, researchers in the study conducted focus group interviews involving academics from various universities in Malaysia. The participants were generally in agreement that their teaching workload is high although they are also expected to perform other academic activities. One of the participants, for instance reported that there is no break between teaching and non-teaching sessions for the medical faculty in her university as the staff have to teach students who need to repeat courses. In addition, it was mentioned besides the "tri-semester" system, some universities are conducting in-between-semester sessions to accommodate graduating students who have failed in some of the courses and where they are given a chance to repeat the course. Some participants also indicated that they had to teach over weekends, a seven-day working schedule for them, and at times the teaching schedule extends from 8 am to 11 pm. The heavy workload, it was mentioned, is much worse for young lecturers as they end up spending a lot of their working time preparing lecture notes, leaving very little time for other academic activities.

A related issue worth mentioning is whether academics who excel in different academics activities should be accorded different routes to or criteria for promotion. Those who excel in teaching may not necessarily excel in research and *vice versa;* those who excel in administration may not necessarily excel in teaching or other academic activities. Accordingly, some of the interviewed respondents believed that those who excel in teaching should be appointed as teaching professors. This then, raises the issue as to whether positions like 'research professor', 'admin professor' and so forth should also be created.

Malaysian academics' inclination to teaching and research

Table 4 shows the distribution of academics preferences in teaching or research according to rank and in total. Most of the academics (89%) can be categorized as having preferences for both teaching and research but leaning more towards teaching rather than research. The following excerpt from the focus group interview identifies the background to this.

> "Actually what is important is promotion. Whether we work in a new university, or an old university, you have to do supervision, research and publication. If all you do is teach then you would not be promoted".

Table 4. Academics preferences in teaching or in research according to academic rank

Item	Academic Rank				Overall
	Professor	Associate Professor	Senior Lecturer	Lecturer	
primarily in teaching	1 (1.4%)	12 (6.9%)	14 (7.3%)	65 (10%)	92 (8.4%)
In both, but leaning towards teaching	24 (33.8%)	78 (44.6%)	91 (47.2%)	319 (48.9%)	512 (46.9%)
In both, but leaning towards research	45 (63.4%)	80 (45.7%)	82 (42.5%)	253 (38.7%)	460 (42.1%)
primarily in research	1 (1.4%)	5 (3.1%)	6 (3.1%)	16 (2.5%)	28 (2.6%)

However, the table shows that the pattern is dependent on academic rank: professors and associate professors preferred both teaching and research but lean more toward research. This can be partly explained by constraints on other academics:

> "I think it quite different with professors. But I think for most of the lecturers, juniors, and junior staffs are struggling. They spend a lot of time making notes".

In other words, junior academics had less time for research because they spent more time on the preparation of their teaching: senior academics have been teaching for many years and do not need to spend so much time preparing lectures and tutorials. Thus, senior academics have more time to conduct research and leaned more toward research instead of teaching as their preference.

Very few of the academics (2.6%) considered research as their primary preference as compared to teaching (8.4%). This reflects the view that academics see teaching more as their main task compared to research.

Malaysian academics' views on scholarship, teaching and research

Table 5 shows Malaysian academics' views on scholarship, teaching and research according to academic rank. Responses to the statements were sought over a range of from 1 to 5 points (strongly agree, 1; strongly disagree, 5).

Table 5. Academics' views on scholarship, teaching and research

Item	Academic Rank			
	Professor	Associate Professor	Senior Lecturer	Lecturer
1. Scholarship is best defined as the preparation and presentation of findings on original research.	1.78	1.96	2.02	2.00
2. Scholarship includes the application of academic knowledge in real-life settings.	1.81	1.82	1.95	1.89
3. Scholarship includes the preparation of reports that synthesize the major trends and findings of my field.	1.94	2.07	2.10	2.07
4. This is a poor time for any young person to begin an academic career in my field.	3.97	4.14	4.03	3.92
5. If I had it to do over again, I would not become an academic.	4.36	4.15	4.24	4.15
6. My job is a source of considerable personal strain.	3.75	3.58	3.53	3.47
7. Teaching and research are hardly compatible with each other.	4.03	3.45	3.38	3.06
8. Faculty in my discipline has a professional obligation to apply their knowledge to problems in society.	2.16	2.25	2.23	2.28

Note: The responses for assistant professors were excluded from this analysis as the sample size was too small (n=2).
Responses might range from (1) strongly agree to (5) strongly disagree. Items 4, 5, 6, 7 were negative items.

The first three items in Table 5 gauge academics' understanding of the definition and scope of scholarship. As expected professors, as the most scholarly recognized academics have the strongest view (mean, 1.78) that scholarship is best defined as the preparation and presentation of findings on original research, more than associate professors (1.96), senior lecturers (2.02) and lecturers (2.00). Accordingly professors were also found to be more inclined to believe that scholarship includes application of academic knowledge in real-life settings (mean, 1.81) and preparation of reports that synthesize the major trends and findings of their respective fields (1.94) compared to other academics. Generally, all the mean scores inclined towards agreement, which implies a consensus among academics about the definition and scope of scholarship regardless of their rank. In other words, Malaysian academics seem to have clear understanding of the meaning of scholarship and what constitutes it.

Items 4, 5, and 6 are concerned with job satisfaction: in each case a majority of responses rejected the negative assertions in the statements. Academics' views on the current prospects for a young person beginning an academic career (item 4) attracted the lowest mean score (3.92) from lecturers as the most junior academics but a slightly stronger rejection from the more senior academics. Similarly, while lecturers reject the statements "If I had it to do over again, I would not become an academic" (item 5) (mean, 4.15) and "My job is a source of considerable personal strain" (item 6) (mean 3.47) they do so slightly less firmly than more senior academics. The findings suggest that lecturers, who are young in academic experience, were slightly less positive about their academic career prospects and career choice and tend to perceive their job as a source of personal strain more than other higher ranked academics. Nevertheless, all the mean scores were well above the mid-score of 3 (in the five-point Likert scale) indicating that academics generally disagree that this is a poor time for young people to begin an academic career, that they would still become academics if had to do over again and that they do not perceive it as a stressful job.

Table 5 shows that on average lecturers have a close to neutral view (mean 3.06) about the compatibility between teaching and research. They seem to accept that teaching and research could be mutually exclusive and contradictory. This is possibly due to the uncertainty among younger academics regarding academics' multitasking roles to teach and conduct research and to integrate research findings into teaching due to a lack of a research culture and experience, and uncertainty of why and how research should be incorporated into teaching

activities may occur:

> "…confuse, we do not have research culture yet….we are very much embarking on research….forcing lecturers to do research, teaching we do not emphasize."

When comparison was made across designations, the mean scores for this item seem to increase according to academic rank. Senior lecturers' mean score was 3.38, associate professors were 3.45 and finally professors have the highest score, 4.03. Academics' acceptance of the compatibility of teaching and research seems to increase according to their academic ranks. It is not surprising that professors have the strongest stand and understanding regarding the link between the two components; they disagree that teaching and research are hardly compatible, in other words, the two aspects are viewed as interrelated and complementary. Yet, overall such a view is still not apparent among younger academics.

Lastly, according to Table 5, professors also agreed (M=2.16) that academics have a professional obligation to apply their knowledge to problems in society. Other academics' mean scores were slightly less affirmative, for instance, associate professors provide a mean score of 2.25, senior lecturers, 2.23 and lecturers, 2.28. The results suggest that professors have the strongest belief that academics' roles are not confined to teaching and research because academics also need to play important roles in finding solutions to solve problems which contribute towards the well being of the society.

Malaysian academics' views on integration of teaching and research

Qualitative data obtained from the focus group revealed that there has been a paradigm shift in Malaysian higher education towards research. One of the participants, for example, identified the change,

> "In the past we are known as a teaching university, we have been doing the teaching work all the while, very much based on teaching rather than research, but we changed towards research…"

Due to this lack of a research culture, the proportion of Malaysian academics who strongly agree that research should be incorporated into teaching activities was extremely low (0.1%) (CAP, 2006-2007 survey). The difficulties

of integrating research into teaching become more apparent when academics are teaching and doing research in different areas, notably when some of the lecturers have to teach in areas other than that of their own area of specialization. Such a scenario is more common in new universities, as mentioned by the focus group addressing the subject,

> "Some of the lecturers are not teaching in their field, their specialization". Hence, teaching and research may be perceived as two separate entities "... *mungkin ramai pensyarah melihat research and teaching merupakan sesuatu yang tiada kaitan* (maybe many lecturers perceive research and teaching as non-related)".

Accordingly, some of the interviewed participants believed that those who excel in teaching should be appointed as teaching professors. In other words, teaching professors may not necessarily excel in research "I fully agree that they must be some sort of teaching professors".

Malaysian academics' views on research efforts

The CAP, 2006-2007 survey shows that nearly all research activities are funded by government entities, own institutions, public research funding agencies or the national organization and only 7.02% is funded by academic themselves. Such figures indicate that securing funding to conduct research is not a big problem in Malaysia. This result is line with the focus group's perception that research activities among Malaysian academics are high. Unfortunately, the outputs from these researches do not match the amount of funding granted. "Number of research *tinggi* (high), but level of publication *rendah* (low)". This phenomenon, according to the focus group, is created partly by a deficiency in performance measurement. According to one of the participants,

> "Even at the research university, I don't think the rewards tie with output of publications. They set, KPI (Key Performance Index), say 3 *per* year. A lot of the times those are not adhered to. At the end of the day, those who do not deliver get to be promoted, get *anjakan* (promotion) or award of excellent. This sends a very strong signal. Even though you do not fulfill the KPI, you are still okay. As a result lots of free riders."

The focus group has also highlighted the lack of internal motivation as a cause of the low level of publication among Malaysian academics. According to the focus group, most academics perceived research grants simply as means for traveling and attending conferences, particularly at the international level. In other words, research grants are external rewards for them to carry out research and publication is deemed secondary. The interview result is supported by the fact that about more than 90% of the academics report that they have presented at least one paper in conferences in the past 3 years (CAP, 2006-2007 survey).

The lack of internal motivation among Malaysian academics towards publication may also affect the quality of the research outputs and this issue needs to be further analyzed. Even though findings from the CAP, 2006-2007 survey reveal that a majority of the academics claimed that they have at least published a research report/monograph from funded projects, around 19% of them are yet to publish in foreign journals and 14.8% of them have not published in peer-reviewed journals at all. Furthermore, most Malaysian academics are still not actively involved in securing patents, writing computer programs for public use or exhibiting artistic works.

Malaysian attitude to research collaboration

In terms of research collaboration, less than 30% of them have collaborated with international colleagues (CAP, 2006-2007 Survey). This small percentage was probably due to academics' belief that initiatives for collaboration should begin at the national level before moving to the international level: as stated by one of the participants "*antara university dulu (*between universities first..)". The low level of international research collaboration was attributed to the lack of contact and networking among Malaysian academics with their international counterparts. "If you don't have the network then that is the problem. So, something has to be done, to bridge this network between one university and another".

Conclusion

The primary purpose of this paper is to describe the three core activities of Malaysian academics: teaching, research and administration.

It was found that academics in Malaysia generally were not engaging themselves in the international arena in terms of research and publication. Only

a small number of them collaborated in research with academics from outside Malaysia, presented papers at international conferences and published in international refereed journals. Certainly, greater efforts are needed to ensure more Malaysian academics are in the international limelight.

A major shift is needed in HEIs in Malaysia that should involve macro-, meso- and micro-levels. At macro-level, the Malaysian Government through the Ministry of Higher Education (MoHE) already has policies in terms of research and teaching activities at international level. MoHE encourages academics to be involved in research and teaching activities at international levels. At meso-level, HEIs have to demonstrate priority for academics to be involved in conducting research and publication at international levels by providing incentives. A review of promotion criteria and the workload of academics who are doing a lot of research and publication at international level is necessary to persuade more academics to be involved in international activities. At micro-level, academics themselves need to see the importance of presenting themselves to the academic community worldwide. To achieve this, Malaysian academics need to be aware of the need to be involved in international activities. In other words, Malaysian academics need to be mindful of their discipline or have an awareness of the discipline as a platform of intellectual and social practice. Thus, this requires a significant change in the normative expectations under which academics operate in HEIs.

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Scholarship of Service: faculty perceptions, workloads, and reward systems

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1. Introduction

Academic researchers have studied faculty activities in terms of their teaching, research, and service. Of these three, teaching and research activities have been explored by many. These studies focused on either teaching or research, or both teaching and research at the same time. So far, researchers have focused on measuring teaching and/or research performance or developing causal models of teaching and/or research. These studies have contributed to our knowledge of the nature of faculty activities and have also contributed to policy practices at the institutional and governmental levels. For example, academic research on the measurement of teaching and research performance has contributed to establishing faculty evaluation criteria and evaluation systems at institutional or governmental policy levels.

More recently, researchers (see Feldman, 1987; Marsh & Hattie, 2002) have focused on the nexus between teaching and research based on empirical evidence. In reality, however, there have been controversies about the relation between teaching and research among academics as well as policymakers. Some researchers report positive relationships between teaching and research, but others find a near zero relationship between them. Although researchers report contradictory results on the nexus between teaching and research, the findings have affected policy development. For example, inspired by Marsh and Hattie (2002) who found that the relationship between teaching and research is near zero, the UK White Paper of 2004 recommended applying a division of labor

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between teaching-efficient faculty and research-efficient faculty (*e.g.*, Leistyte, Enders & Boer, 2009).

Contrary to teaching and research, service activity has been less highlighted in academic research. In some respects, service activity is considered less important compared with teaching and research. Founders of the modern university have not questioned the assumption that professors would teach students based on the area of their researches since the German model was disseminated worldwide in the 19th century. Similar to the teaching-research relationship, research might be associated with service activities. A positive relationship between research and service activity has also been assumed and implemented in policy practice. For example, the German model was based on the philosophical assumption that research contributes to national development. A similar idea was applied in the land grant universities in the US where the federal government provided financial support to public universities.

The research-teaching relationship has diminished since universities, especially research universities, have focused more on research and relatively less on teaching and service. To enhance their reputation and ranking status, higher education institutions began to emphasize research productivity, which is viewed as the main indicator of institutional performance. This trend to emphasize research performance has been reflected in faculty evaluation systems also. Such systems tend to primarily evaluate faculty by their research performance although teaching and service activities are also included in the evaluation. Such evaluation and reward systems reinforce faculty research activities while weakening teaching and service.

There was little comprehensive discussion on academic scholarship until Boyer (1990) proposed four dimensions of scholarship in 1990. In his book "Scholarship Reconsidered", Boyer proposed discovery, application, integration, and teaching as the four dimensions of academic scholarship. Following this, academic researchers and higher education institutions began to develop a model of academic scholarship and applied it in their institutional innovation. Empirical studies reported that these efforts have changed evaluation criteria and reward systems, faculty activity, and even academic culture to some extent (O'Meara, 2002, 2005).

These effects are noticeable in faculty teaching. The changes are seen less however in faculty service activities. As O'Meara (2002) argued, "even when official policy language includes the evaluation and reward of multiple forms of scholarship, conscious and unconscious values and beliefs held by faculty facilitating the reward system can prevent newer forms of scholarly work from

being accepted and rewarded" (pp.76-77). Why are the systemic efforts less successful in service activities?

There are several possible explanations for this. A primary reason might be the difficulty of measuring faculty service activity (Bensimon, Ward, & Sanders, 2000; O'Meara, 2002); in addition, outcomes and effectiveness of service activities are often unknown (Ward, 2003). Further, there is no agreed definition of faculty service: it may be understood as 'engagement', 'out-reach' or 'service'. Each definition has a different emphasis. Also, the range of service activity, whether the service is defined as engagement, outreach, or service, differs depending on the definition: it may or may not include civic activity (*e.g.*, participation in a cultural event), paid consulting, service activities not based on discipline-based expertise (Ward, 2003).

In addition, relatively little is known about faculty service activity itself compared with teaching and research. Faculty workload studies have provided information on how many hours faculty work on service activity, but we lack comprehensive information on faculty service in general, *e.g.*, faculty preference for service activity compared with teaching and research, perception of scholarship in relation to service, the nexus between other activities (*e.g.*, teaching and research) and service activity, institutional reward systems and so forth. As Ward (2003) proposed, in addition, service activity differs, depending on institutional mission, faculty rank, and affiliated disciplines. It is rare that studies address these issues because they cover such a broad range of information on faculty activities. Fortunately, the CAP survey includes comprehensive items on teaching, research, and service activities and related factors. The primary goal of this paper is to analyze and discuss plenary information about faculty service activity and related issues based on CAP data.

2. The background to and contexts of faculty service

Range of service activity

One approach to faculty service is from a perspective of the *scholarship of service*. Boyer's (1990) four dimensions of academic scholarship represent this approach. According to Boyer, academic scholarship is integrated with the other academic activities though it has different dimensions depending on its emphasis. Among the four dimensions, scholarship of application is related to faculty service, which emphasizes application of knowledge to solve social problems. Another approach of faculty service is to classify faculty activities into a simple conceptual framework. A binary classification was proposed by

Ward (2003), who classified faculty service as internal service and external service. Internal service includes service to the campus, to the discipline, and to students. Service to the campus includes service activities such as academic oversight, institutional governance, and institutional support (Finsen, 2002).

In addition to service on the campus, professors serve their academic disciplines. Professors are involved in service activities through various associations (*e.g.*, membership committees, program committees, reward committees) and publication-related activities (*e.g.*, editorial boards, reviewers *etc.*). Finally, professors serve their students (*e.g.*, by advising, counseling, writing recommendation letters). However, faculty service to students is related to teaching and research activities and might not be clearly differentiated from these two activities in some cases (Ward, 2003).

External service is a way for higher education to communicate with external stakeholders. Fear and Sandmann (1998) view higher education as a knowledge enterprise and define outreach as "generating, transmitting, applying and preserving knowledge for the direct benefit of external audiences that are consistent with university and unit missions" (cited in Ward, 2003, p.113). According to the definition, "not all service roles apply or require an individual's scholarly expertise, and not all are deemed scholarship" (Ward, 2003, p.71). According to Ward (2003), faculty external service includes extension, consulting, service-learning, community-based action research, and community and civic service. This paper will not discuss the details of external service activities (for details, see Ward, 2003).

Issues related to service activity

Although scholars as well as higher education institutions classify faculty services, it is difficult to decide whether a specific faculty activity is a service activity in the real world or not. The four issues related to faculty service activities can be summarized as follows.

First of all, does service activity include only the expertise-based activities of faculty? Some service activities are not related to faculty expertise while other activities are. If a member of faculty is actively involved in civic activity but the activity is not related to his/her academic expertise, is that a service activity? According to Boyer (1990), it is not, because service activity includes only expertise-based activity. However, the issue remains controversial.

Second, is paid activity, service activity? Professors in some disciplines are engaged in well paid consulting for private companies. Is this activity a service activity or not? Business administration and engineering faculty might

contribute to regional economic development through a paid activity by using their disciplinary knowledge. If the main purpose of their service activity is to generate financial benefit as well as contribute to the community, the nature of the activity remains a gray area. This type of activity is growing among faculty in applied science areas.

Third, is political activity a service activity? Some professors are actively involved in politics, (*e.g.*, participating in a political election as a candidate, applying for a leadership position in a national research institute). In some respects, these activities might be considered service if they are based on their academic expertise. For example, a professor of chemistry might apply for the presidency of a National Science Foundation; a professor of education might be a candidate for superintendent of a province; a political science professor might be a candidate for a national assembly. Are these service activities? If they resign from their faculty positions, there might be no controversy on the issue, but if they hold their positions during an election campaign and/or after they are elected, there might be controversy on whether their activity is really service.

Fourth, is faculty participation in a general civic-activity as a citizen a service activity? For example, many professors are involved in non-governmental organizations. The organizations may or may not be related to their areas of expertise. For example, an economics faculty member might be involved in a non-government organization that is interested in a free trade agreement (FTA) between the nation and other countries. There might be a chance for the professor to contribute to non-governmental activities with his/her expertise in economics.

Differences in service activity

Faculty service activities differ depending on their institutional mission, their affiliated disciplines, their rank, and demographics (Ward, 2003). Faculty service differs in its types and relative weight between teaching, research, and service, according to institutional mission types (O'Meara, 2002). Faculty in a research university might contribute to their community with knowledge transfer while faculty in a polytechnic might contribute by providing skills. Moreover, faculty activities differ depending on their affiliated disciplines (Becher & Trowler, 2001; Biglan, 1973). Applied sciences faculty are more actively involved in service activities compared with their colleagues in pure sciences (Antonio, Astin, & Cress, 2000; Braxton & Hargens, 1996; Braxton, Luckey, & Helland, 2002).

In addition, researchers found that faculty activities differ according to their

career stages, gender, and ethnic groups. For example, Baldwin, Lunceford & Vanderlinden (2005) found that mid-career faculty spend more time on administrative activities on campus than do junior and senior faculty. As many studies (*e.g.*, O'Meara, 2002; Antonio *et al.*, 2000) found, faculty who are heavily involved in service activity are also the most marginalized in the academic culture. Female faculty and minority background faculty tend to be more involved in service activity on and off campus because they are invited by many committees to represent minorities in US higher education (O'Meara, 2002; Ward, 2003).

It is clear that the inclusion of institutional mission, disciplinary differences, and faculty demographics in analyzing faculty service activity provides more in-depth information on the diversity of service activities.

The Korean context

As in other countries, higher education institutions in South Korea esteem research more highly than teaching or service activities. The emphasis on research was initiated and accelerated by government policy to enhance the competitiveness of higher education institutions. For example, the government set a guideline for faculty hiring and promotion, regardless of whether it is a private or public institution, and the guideline is still in the place today. In the early 1990s, the government began to allocate funding based on institutional performance, which is mainly focused on research performance. Under this national policy, higher education institutions emphasize faculty research, and assign less weight to teaching and service activities.

On the other hand, faculty have a strong tradition of involvement in political and social movements since the early 1960s, beginning with the student resistance that overturned President Lee's government in 1960. Also, professors had been outspoken when the military government attempted to limit civil rights during the military regimes from the 1960s to the 1980s. The strong political voice of academics against dictatorships has transformed political participation in the democratized government since the late-1980s. Professors are actively involved in internal governance of their university, and are especially critical during university presidential elections. In addition, the departmental chairmanship is a service activity because the chairman's position is rotated among faculty members, making even departmental leadership a service activity. Faculty are also expected to participate in the student admission process, committees, and so forth.

Professors undertake a variety of external service activities. They

participate in policy-action research, act as consultants in government policymaking, are opinion leaders, serve in political positions (*e.g.* as the president of a government-established research institute, or as a national assembly member), or participate in a non-governmental organization. The external activities of faculty in a Korean context are summarized as follows.

- Policy-action research. Many government policies have been studied or proposed through policy-action research conducted by academics. Policy-action research provides an opportunity for academics to participate in government policymaking and also to gain research funding from government.
- Consultation services to government, community, private corporations. Government, community, and private corporations rely on the knowledge of academics because the university is the place where specialists in each branch of disciplines work together. As a result, more and more faculty are engaging in paid and non-paid consulting.
- Opinion leaders. Newspapers hire faculty as their columnists or as editorial writers to provide specialized opinions for their readers. In addition, professors are one of main groups of participants in public hearings convened by the government, national assembly, or non-governmental organization.
- Political positions. Professors are actively involved in national and local politics. In addition, they participate in the political leadership positions of government-owned research institutions. Although there is controversy, the academic community in Korea regards politics-oriented activities favorably.
- Participation in non-governmental organizations. Academics are involved in NGO activities that may or may not be related to their academic disciplines. Many of the founders of NGOs are professors and they are active members of the organizations.

3. Method

Data

The data were collected as a part of the international CAP comparative study in 2008. Each country used the same survey questions. The population in the Korean study was 52,763 full-time faculty who are affiliated with bachelor degree granting institutions in South Korea. The data were collected through

an on-line survey to which 900 professors responded. The survey questions included faculty demographics, their careers, activities (teaching, research, and service), institutional management and culture. The survey data are informative in analyzing faculty service activities in general because the CAP survey includes diverse types of service activity, the time spent on service activity, the perceptions of academic scholarship (discovery, integration, and application), preferred types of research (basic *vs*. applied), and personnel reward systems. The use of CAP data enables a researcher to conduct a comprehensive study on faculty service activities and its related topics.

Research focus

This study focused on six topics of interest.

- A faculty view of scholarship of service. Since Boyer proposed four dimensions of academic scholarship, teaching and service have been emphasized in many higher education institutions. This study seeks to analyze how faculty perceive academic scholarship. The CAP survey covers matters such as discovery, integration, and application.
- Types of service activity. Service activities include different types of activities. This study aims to provide information on the types of service activities that professors were involved in during 2008 when the survey was conducted.
- Effects of faculty workload on service activity. This study is expected to provide access to the time faculty spend on service activities.
- The relationship between different types of scholarship. The data examine the relationship between service, research and teaching. Specifically, this study addresses the question, "Do faculty emphasize practically oriented knowledge or skills in their teaching?"
- Organizational culture. The analysis explores whether higher education institutions reinforce the service activity of their professors.
- Faculty evaluation systems. The study seeks to establish to extent to which service activity is included in faculty evaluation criteria.

Analytical strategy

This study focuses on how the variables of interest provided by the six issues differ by institutional mission, their affiliated disciplines, and faculty career stage.

- Institutional missions are classified according to the categories Research university, PhD granting university, and Comprehensive university, based on Shin's classification (for details, see Shin (2009a)).
- Academic disciplines are classified in terms of a pure-applied dimension because service activities are assumed to differ between pure sciences and applied sciences (for details, see Shin (2009b))
- Career stages are classified as early, mid-, and late careers: early career (aged 39 or younger), mid-career (aged 40-55), and late career (aged 56 or older). The age of 65 years is the retirement age in most higher education institutions in Korea.

4. Results and discussion

Types of service activity

Faculty are very involved in scientific committees and academic services, in such roles as peer reviewers, editors, and leaders of academic organizations. However, they participate less in community and political service activities than in scientific and academic service activities. One noticeable feature is that faculty in a research university are more actively involved in scientific and academic services compared with their peers in PhD granting and comprehensive universities, while they are less actively involved in community service than PhD granting and comprehensive universities. Early career faculty are less involved in service activities compared with mid- or late career faculty. Also, female faculty are more active involved in community service than their male peers. These findings are quite similar to the findings of other researchers.

These findings imply that research universities attach more weight to academic research and research-related activities than to other types of service activities. Early career faculty may have less opportunity to participate in scientific committees compared with their mid- or late career colleagues. However, a relatively high proportion of early career faculty are involved in research-related service activity. As Table 1 shows, about half of early career faculty are engaged in scientific and academic service which means that they are responsible for much of academic service work.

Table 1. Faculty service activity (%)

Service Activity		Mission			Career			Gender	
		Research	PhD	Compre-hensive	Early	Mid	Late	Male	Female
Scientific committees		89	78	77	66	82	87	79	85
Academic service	Peer reviewer	88	80	72	66	82	77	79	77
	Journal editor	65	63	54	40	67	48	59	65
	Leaders of academic organization	77	73	76	43	80	86	73	79
Political service	Elected officer/ union leader	2	2	5	0	5	0	3	3
	State politics	2	4	2	1	4	2	4	1
Community service		15	25	32	15	27	29	24	29
Work with service agency		8	13	16	7	14	14	13	13

Note. Proportion of faculty who currently undertake these activities.

The situation becomes clearer in international comparisons. As shown in Table 2, Korean academics are very involved in scientific and academic service compared with other countries. Korean academics are three to four times more likely to be involved in scientific committees at national or / and international levels than their colleagues in the UK, Australia, or Germany, and twice as likely as in Japan, a culturally comparable country. Many Korean professors serve as journal editorial board members and act as leaders of academic organizations.

There may be several reasons for this finding. First of all, there are so many academic organizations, academic journals, and scientific committees that many faculty need to be involved in the activities of these organizations, journals, and committees regardless their career stages. Korean academic society is considerably smaller than that of the US, but proportionately, many more academics are involved in such activities. Second, the Korean government has emphasized research performance since the early 1990s, so forcing academics to publish more in order to meet the publication requirements set by the government or their institutions. Third, the government established many committees to deal with conflicts between interest groups and to draw on the relevant experience and knowledge of professors.

Table 2. Faculty service activity (international comparison) (%)

Service Activity		USA	UK	Aus.	DE	IT	Japan	Korea
Scientific committees		29	22	25	20	51	38	81
Academic service	Peer reviewer	65	52	62	31	55	61	78
	Journal editor	19	18	18	23	10	26	61
	Academic organization	28	12	23	25	11	52	75
Political service	Elected officer/union leader	2	3	2	1	1	4	4
	State politics	14	3	4	2	4	1	3
Community service		48	16	37	0	14	20	25
Work with service agency		20	9	10	16	8	10	13

Note. Proportion of faculty who currently undertake these activities.

Service workloads

Because faculty are engaged in many types of service activities, time spent on service activity is an important factor in analyzing faculty service. Faculty spend, on average, 4.6 hours *per* week on service activity and 6.0 hours *per* week on administration during a semester. Service activities do not differ much by mission types, affiliated academic disciplines, or career stages. However, administrative activities are quite different across career stages, with early career faculty averaging 3 more hours on administrative service than late career faculty.

Faculty may consider time on administration as part of their regular workload or as service to society. If the service workload is imposed by others (*e.g.*, administrative authority, cultural patterns), that might be regarded as a service activity. For example, a department chairmanship is not a service activity in many US universities because administration is viewed as regular work. However, being a department chairman is seen as service work in many Korean universities because the role is given to them as an academic duty. In this situation, a heavy administrative burden for an early career academic raises issues about faculty workloads.

Korean academics spend more time on service activities than their peers in other countries. German professors spend the highest time on service activities (5.7 hours *per* week) followed by Korea (4.7 hours), and the USA (4.6 hours). However, Korean academics spend less time on administration than their peers in other countries. This finding implies that many Korean academics spend more time on service but less on administration (committees, department meetings, and paperwork) compared to their peers in other countries. These

findings need more in-depth study to fully understand the situation. One hypothesis is that academics spend more time in off-campus service (service), but less time in on-campus service (administration). In some respect, Korean academics contribute more to their society through service activities but less to their own campus. This is a good sign from the service point of view, but it may be a bad sign for their students and their institutions.

Table 3. Service workloads (hours *per* week)

Workloads	Mission			Discipline		Career		
	Research	PhD	Com	Pure	Applied	Early	Mid	Late
Teaching	17.8	20.9	23.3	21.4	20.9	23.2	20.7	20.7
Research	21.3	18.6	16.3	19.4	17.7	18.5	18.1	19.4
Service	5.0	4.7	4.8	4.0	5.2	4.7	4.7	5.0
Administration	6.4	6.0	6.0	5.8	6.2	7.1	6.2	4.3
Total	54.8	53.4	53.5	53.8	53.6	56.8	53.2	52.7

Note. Hours *per* week spent on the listed academic activities during teaching semesters.

Table 4. Service workloads (international comparison) (hours *per* week)

Workloads	USA	UK	Australia	DE	IT	Japan	Korea
Teaching	21.2	18.3	17.6	13.9	18.8	20.4	21.1
Research	12.4	12.1	13.9	15.6	17.4	16.6	18.1
Service	4.6	1.6	2.9	5.7	2.5	3.9	4.7
Administration	7.7	9.6	8.8	4.5	4.3	7.2	6.0
Total	48.7	44.8	46.2	42.9	45.4	51	53.2

Note. Hours *per* week spent on the listed academic activities during teaching semesters

Perceptions of academic scholarship

Faculty perceptions about academic scholarship do not differ by institutional mission, but do differ by discipline and career stage. About 80% of professors perceive that application is a form of scholarship and 76% of them believe that their discipline has a professional obligation to apply its body of knowledge to resolving social problems. Korean academics hold these beliefs much more strongly than their peers in other counties. This finding is related to the data showing that Korean faculty spend more time on service activities than their peers in other countries.

There are noticeable differences among faculty regarding their perceptions of academic scholarship. Fewer faculty in the pure sciences than their peers in

applied sciences consider application to be scholarship. In addition, pure science faculty are less likely to believe that their disciplines have an obligation to apply their knowledge to society. These findings confirmed our expectations. In general, faculty in the applied sciences attach more weight to the application of knowledge and they are more likely to say they intend to apply their knowledge to solve social problems.

Faculty perception on academic scholarship differs by career stage. In relation to the application of knowledge, 81% agree that application is a part of academic scholarship while 88% of late career faculty agree with it. In addition, the early career faculty feel less obligation to apply their knowledge to social problems than the late career faculty. The findings imply that junior faculty are less likely to perceive service activities as scholarship compared with senior faculty.

Table 5. Perceptions on the scholarship of service (%)

Types of Scholarship	Mission			Discipline		Career Stages		
	Research	PhD	Compre-hensive	Pure	Applied	Early	Mid	Late
Discovery	79	78	77	85	73	78	77	83
Application	79	84	82	71	88	81	82	88
Integration	90	89	93	90	91	86	91	95
Social service	71	78	76	69	80	68	77	81

Note. Proportion of faculty who agree or strongly agree that scholarship is best defined as, or includes, the listed activity or carries an obligation towards social service.

Table 6. Perception on scholarship of service (international comparison)

Types of Scholarship	USA	UK	Australia	DE	IT	Japan	Korea
Discovery	69	67	67	72	73	77	78
Application	81	70	74	70	60	75	83
Integration	70	67	67	67	46	81	91
Social service	67	59	64	55	61	65	76

Note. Proportion of faculty who agree or strongly agree that scholarship is best defined as, or includes, the listed activity or carries an obligation towards social service.

Service, teaching and research

How much do faculty try to disseminate their knowledge and research into their society (*e.g.*, their community, nation)? As shown in Table 7, faculty in research universities are less likely to emphasize practically-oriented knowledge

and skills in their teaching than their peers in other types of institutions. Also, faculty in applied disciplines and faculty later in their careers tend to place greater emphasis on practical knowledge and skills in their classroom activities.

Similar trends have been found in relation to research activities. Professors in research universities are less active in conducting practically-oriented research or socially-oriented research compared with their peers in PhD granting and comprehensive universities. Faculty in applied disciplines are more active in conducting practically-oriented or socially-oriented research than their peers in pure disciplines, and later career faculty conduct more socially-oriented research than early career faculty.

In general, Korean academics emphasize practical knowledge and skills in their teaching and are active in conducting practically oriented research. As the international comparisons (Table 8) show, Korean academics rank above average in the practical orientation of their teaching and research.

Table 7. Orientation of teaching and research (%)

Research And Teaching	Mission			Discipline		Career		
	Research	PhD	Compre-hensive	Pure	Applied	Early	Mid	Late
Practically oriented teaching	69	79	76	65	82	73	77	74
Practically oriented research	71	73	76	56	84	75	75	67
Socially oriented research	25	33	42	31	36	25	36	38

Note. Proportion of faculty who agree or strongly agree that they emphasize a practical or social orientation.

Table 8. Orientation of teaching and research (international comparison) (%)

Research and Teaching	USA	UK	Australia	DE	IT	Japan	Korea
Practically oriented teaching	70	68	75	79	52	50	76
Practically oriented research	74	66	77	71	60	69	74
Socially oriented research	35	46	61	36	33	31	35

Note. Proportion of faculty who agree or strongly agree that they emphasize a practical or social orientation

Institutional climate and reward systems

Does faculty evaluation consider service activities as a criterion of faculty tenure and promotion? According to the literature, many universities in the US emphasize service activities, but the reward systems do not reflect this. As a result, faculty who are actively involved in service activities are disincentivized

from spending their time on service activities that are not regarded as worthwhile. As Table 9 demonstrates, higher education institutions encourage service activities, but their personnel decisions are based on research and teaching (and mainly on research performance). Only 15% of the faculty indicated that their institutions take their service activities into account in faculty personnel decisions.

Higher education institutions in Korea encourage their faculty to become involved in service activity for several reasons, but principally because participation in a government committee is highly encouraged by institutions and rewarded by some universities, especially less well known institutions. Institutions encourage their faculty participation in government committees because it contributes to building an institutional reputation. In addition, government committees provide channels for high-value information that may be helpful to higher education institutions.

Table 9. Institutional climate and reward systems (%)

Evaluation Criteria & Climate	Mission			Discipline		Career		
	Research	PhD	Compre-hensive	Pure	Applied	Early	Mid	Late
Research quality	46	37	23	33	35	39	33	34
Teaching quality	27	25	22	24	25	26	24	26
Practical relevance of faculty work	15	16	15	14	16	14	16	14
Encouraging service activity	17	26	37	27	28	34	26	32

Note. Proportion of faculty who agree or strongly agree that in making personnel decisions, their institution considers the listed criteria.

Table 10. Institutional climate and reward systems (international comparison) (%)

Evaluation Criteria	USA	UK	Australia	DE	IT	Japan	Korea
Research quality	47	66	50	53	23	60	33
Teaching quality	51	33	28	27	11	39	24
Practical relevance of faculty work	30	26	24	25	10	26	15
Encouraging service activity	37	30	36	57	15	27	28

Note. Proportion of faculty who agree or strongly agree that in making personnel decisions, their institution considers the listed criteria

Nevertheless, higher education institutions do not actively take into account service-related activities in their personnel decisions. South Korean universities are less proactive in introducing reward systems that include

service-related activities in their evaluation than most other countries (Table 10). This failure is highest in Germany followed by South Korea. As O'Meara (2002) argued, "asking faculty to do one thing and be rewarded for another is dysfunctional for individuals and for the institution" (p.76).

5. Concluding remarks

In this study, the data led to some informative insights on service activity and academics' perceptions about their service activities. First of all, Korean academics are actively involved in scientific and academic service activities, but much less in community activities. Second, in Korea, academics have a more positive attitude toward the scholarship of service compared with their peers in other countries. Third, faculty service activities differ markedly by institutional mission, discipline, and career stage. This finding implies faculty service activities are understood and approached differently according to their institution, their discipline areas, and their career stages.

Faculty service is a complicated concept and it is difficult to formulate an agreed-on definition. We addressed and discussed service activity by using the CAP data. However, because of the lack of any uniform definition of the service activity, the CAP survey could not maintain consistent terms throughout the survey. For example, some items are referred to "service" activity but terms such as "scholarship of application" or "practicality" are used in other places. Notwithstanding this limitation, the CAP data provided comprehensive data that enabled us to analyze service activity and its related dimensions.

In conclusion, the question may be asked: why are policymakers and business leaders negative toward faculty service activities in Korea? Many of them complain that higher education does not meet societal demands and yet, at the same time demonstrate such a negative attitude toward faculty service. People argue that professors should stay on campus and do their job rather than be involved in service activities (*e.g.*, government committees, non-governmental organizations, political parties, election participation). Sometimes, service activity is criticized by policymakers and news media as the reason for a loss of competitiveness. Thoughtful discussions on the definition of service and further in-depth study on the quality of service activity might provide answers to this issue in the future.

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The Divergent Worlds of Teaching and Research among Mexican Faculty: tendencies and implications

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Introduction

While the academic profession and its associated work are recognized as central to higher education, the function which has been associated with faculty work since early times is teaching (Altbach, 1991). Identified as the "key" profession, it is recognized as such because of its teaching function in relation to all other professions (Perkin, 1987). Research is, on the other hand, a relatively recent development in the history of universities (Perkin, 1991). Nowadays, however, higher education confronts a greater expectation of relevance coming from a society that includes the training of highly skilled personnel for a

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knowledge-based economy and seeks not only research in terms of the production of knowledge but also of the application of such knowledge, in a relatively short period of time, in the enrichment of technologies currently in use by different sectors of society (Brennan, 2007).

Given the importance of teaching and research activities for higher education institutions, it is most relevant to analyze the relationship between these two central activities of academic work. In this paper we will explore this relation for the case of Mexican faculty. After a brief discussion of the way in which teaching and research might be related, and the way in which such a relationship might be studied, the paper proposes a Teaching-Research Involvement Classification (TRIC) of Mexican faculty that is considered to be pertinent to the current situation of Mexican higher education. The paper then presents data on faculty activities and productivity, academic preferences and notions of academic work, recognition and compensation, personal characteristics and, finally, job satisfaction and commitment, that largely support, the discriminatory characteristics of such a faculty classification and fundamentally, that teaching and research activities serve to differentiate two academic worlds, in the case of Mexican higher education. Finally, the paper ends with a brief recapitulation of the information presented and small set of reflections based on them.

The teaching-research relationship

While it is commonly recognized that teaching and research, together with service, are at the core of higher education institutions and, therefore, are central components of academic work (Bowen & Schuster, 1986; Boyer, 1990), it is also now more commonly recognized that their realization with the highest involvement and quality in the same institution or by the same individual along its entire professional career is not the rule (Clark, 1987; Rice, 1996). Additionally, it must be kept in mind that teaching and research admit various ways of being interpreted and implemented as a function of the discipline in which they take place (Becher, 1989). So, it is to be expected that the teaching-research relationship might vary depending upon the institution, the discipline and the individuals, including their career stage, involved. In this paper we will concentrate on individual differences, leaving for another work the analysis of institutional, disciplinary and stage-related dimensions.

Three general perspectives can be identified regarding the potential relationship between teaching and research in higher education at the level of

individual academics (Fairweather, 2002; Marsh & Hattie, 2002). The first one states that teaching and research are mutually reinforcing and, in line with such a position, faculty can be highly productive in both such activities. A second position maintains that there is actually an inverse or competing relationship between research and teaching, particularly at the undergraduate level, where both activities compete for the limited time, resources and energy that faculty members have in doing their work. Finally, a third position holds that teaching and research are un-related and, therefore, an academic can be productive in one aspect without necessarily being productive in the other aspect. This last position is probably the one more consistent with Boyer's (1990) proposition that there are four types of scholarship that, although sharing a common substantive theme and requiring from all of them intensive and high-quality work, differ in their emphasis on the teaching, integration, discovery and application of knowledge.

In analyzing the potential relation between teaching and research it is possible to proceed in at least two ways. In one measures of teaching and research productivity are identified and, afterwards, correlations between the selected measures are run to test the nature of the relationship under study. A second way to proceed is to identify, whether on mainly statistically or conceptual grounds, groups of academics and then use observations of the ways in which measures associated with teaching and research vary between the identified groups, as Gil-Antón *et al*. (1994) and Villa-Lever (1996) have done.[1] This last approach is the one we will follow in this paper. More specifically, the starting assumption will be that research and teaching "productivity" are inversely related (Fairweather, 2002; Marsh & Hattie, 2002) and, thus, both activities can be captured, at least for the current Mexican situation, by means of a single classification scheme. As in previous papers, the work will be done by taking into account only full-time faculty (N_T=1775) sampled according to a procedure also described earlier (Galaz-Fontes *et al*., 2008, 2009). Although there are potentially important disciplinary, institutional and career-stage related differences, these will not be pursued in this paper.

[1] Gil-Antón *et al*. (1994) discussed fully- and marginally-involved academics, while Villa-Lever (1996) described teachers, researchers and administrators.

A "Teaching-Research Involvement Classification" based on research productivity and highest degree

Table 1 classifies Mexican f-t faculty according to their participation in the National Researchers' System (SNI, Sistema Nacional de Investigadores) and, at the same time, their highest degree. This cross-tabulation served as the basis for the Teaching-Research Involvement Classification (TRIC) shown in Table 2. As membership of the SNI is attained through a national peer review process that focuses on published work, we selected this group as the most research-oriented (SNI members, n=366 [21.5%]). From such a departure point and by regarding faculty in the rest of the groups as not as intensively involved in research as recognized by SNI, the next logical research-involved group is the one composed by academics holding as their highest degree a doctorate or a post-doctorate qualification (non-SNI doctors, n=240 [14.1%]). Leaning less towards research, the third and largest group is associated with faculty with graduate studies completed up to a master's degree (non-SNI masters, n=765 [45.0%]) and, finally, the fourth group, which was expected to be more naturally devoted to teaching, is composed of faculty holding, at the most, a licentiate degree (non-SNI licentiates, n=327 [19.3%]). Using highest degree as a second classification criterion was considered reasonable because of the importance given to it by institutional academic regulations that usually assign less teaching and more research responsibilities the higher the degree and rank of a faculty member and, most importantly, by the latest public policies towards higher education and its funding (Rubio-Oca, 2006). The order found in the results that are reported here further justifies - and most definitively - the use of the two criteria.

Table 1. Distribution of f-t Mexican faculty according to their highest degree and their membership in the national researchers' system (SNI) (N_T = 1,775)

	National Researchers' System		Total	
Highest Degree	No	Yes	n	%
Up to licentiate	327	7	334	19.7
Graduate studies, up to master's	765	14	779	45.9
Doctorate	226	267	493	29.0
Post-doctorate	14	78	92	5.4
Total	1,332	366	1,698	
%	78.4	21.6		100.0

Table 2. Classification of f-t Mexican faculty according to a teaching-research involvement dimension based on membership in the national researchers' system (SNI) and on highest degree (N_T = 1,775)

Teaching-Research Involvement Classification	N	%
Non-SNI Licentiate	327	19.3
Non-SNI Master	765	45.0
Non-SNI Doctor	240	14.1
SNI Member	366	21.5
Total	1,698	99.9

The results of the above classification exercise are presented in Table 2, which shows the distribution of faculty according to the TRIC just described. Notwithstanding that the non-SNI doctor group represents 14.1% of all the full-time faculty considered, having nearly 20% in both extremes of the teaching-research based classification, the number of cases in each of the groups thus formed seemed appropriate to allow the exploration that follows.

Teaching and research correlations to the TRIC

Having defined a TRIC, in this section its relationship to various specific teaching and research activities will be examined. Table 3 shows, for each TRIC group, the mean of a typical research productivity index based on the number of various academic publications and conference presentations for the last three years. As can be observed, differences in the mean number of reported publications for the last three years are considerably and statistically different between each contiguous group, ranging from a mean of 2.3 publications for non-SNI licentiate faculty, to a mean of 17.1 publications for SNI members, with non-SNI masters and non-SNI doctor academics reporting means of, respectively, 5.9 and 10.8 publications.

Table 3 also presents data on the average weekly hours that surveyed faculty reported spending in research activities. Once again, differences are considerable and statistically significant for each contiguous group and in the expected order. So, while non-SNI licentiates reported a mean of 4.2 weekly hours devoted to research, the corresponding figure for SNI members was 20.3 hours *per* week, with non-SNI masters and non-SNI doctors reporting, respectively, means of 7.4 and 11.8 hours *per* week. These two distributions provide acceptable concurrent validity, from the research dimension side, to the TRIC built on the basis of SNI membership and highest degree attained.

Table 3. Academic publications in the last three years and weekly hours devoted to research activities, by faculty teaching-research involvement (N_T = 1,775)

Teaching-Research Involvement Classification	Academic products*[1]			Weekly hours in research		
	n	Mean*[2]	SE	n	Mean*[3]	SE
Non-SNI Licentiate	267	2.3	0.3	283	4.2	0.4
Non-SNI Master	711	5.9	0.3	697	7.4	0.3
Non-SNI Doctor	237	10.8	0.8	224	11.8	0.6
SNI Member	364	17.1	0.8	335	20.3	0.6
Total	1,578	8.6	0.3	1,539	10.2	0.3

*[1] Index built by adding directly the number of academic books authored, books edited, journal papers, book chapters, research monographs and conference presentations reported for the last three years.
*[2] $F_{3,1575} = 125.527$, $p < .00001$, η^2 0.193.
*[3] $F_{3,1536} = 223.697$, $p < .00001$, η^2 0.304.

After having documented that the TRIC is highly correlated with two commonly used measures of research productivity (number of publications and time involved in research activities), Table 4 presents data related to the relationship between such classification and teaching activities. Specifically, for each TRIC group, Table 4 shows the mean number of hours that faculty reported to be involved in classroom instruction and also the mean number of total hours devoted to teaching activities in general, which includes not only classroom instruction, but also activities such as class preparation, grading and tutoring students. As can be observed, weekly hours devoted to classroom instruction and to teaching in general are very similar in each case for both non-SNI licentiate and non-SNI masters faculty (approximately 14 and 24 hours *per* week, respectively). It seems, then, that teaching responsibilities (classroom instruction) and involvement (teaching activities overall) are little affected by whether an academic has a licentiate or a master's as a highest degree. It will be recalled, however, that non-SNI masters faculty reported investing more hours in research than their non-SNI licentiate colleagues (means of 7.4 *vs*. 4.2 hours *per* week) and, additionally, they also reported more publications (means of 5.9 *vs*. 2.3 publications during the last three years).

In contrast, non-SNI doctors reported, on average, about two hours less *per* week of classroom instruction and also of teaching activities in general (11.6 and 21.3 hours *per* week, respectively). Moreover, as is shown in Table 4, SNI members reported nearly four hours less of classroom instruction and about six hours less of total teaching activities (8.0 and 15.2 hours per week, respectively). These figures show that, while not as strongly as for the research measures,

TRIC correlates quite reasonably with time measures of teaching involvement. On the other hand, it appears that non-SNI masters, in comparison to their non-SNI licentiate colleagues, are more involved and productive in research while, at the same time, maintaining a high level of involvement in teaching.[2] Moving to a higher degree and, ultimately becoming a SNI Member, however, takes f-t faculty to a situation in which there is a significant exchange between research and teaching involvement.

Table 4. Weekly hours devoted to classes and to teaching activities in general, by faculty's teaching-research involvement (N_T = 1,775)

Teaching-Research Involvement Classification	Weekly hours devoted to classroom instruction			Weekly hours devoted to teaching activities		
	n	Mean*[2]	SE	n	Mean*[3]	SE
Non-SNI Licentiate	283	14.7	0.6	283	24.4	0.7
Non-SNI Master	697	14.0	0.3	697	23.5	0.4
Non-SNI Doctor	224	11.6	0.4	224	21.3	0.7
SNI Member	335	8.0	0.3	335	15.2	0.5
Total	1,539	12.5	0.2	1,539	21.5	0.3

*[1] In addition to classroom instruction this category includes class preparation, grading and tutoring students.
*[2] $F_{3,1536} = 62.212$, $p < .00001$, η^2 0.108.
*[3] $F_{3,1536} = 57.948$, $p < .00001$, η^2 0.102.

Another informative measure of teaching productivity is the number of students taught. Table 5 presents, for each TRIC group, the mean number of students taught at the licentiate, master's and doctoral levels during the current academic year. As it can be observed, non-SNI licentiate and non-SNI master academics attend to more than 100 students in licentiature programs. In contrast, non-SNI, doctor faculty attend on average 79 students in these same programs, while SNI members report attending to a mean of 40 students at the same level. So, the higher the level of research involvement as measured by the TRIC, the lower the number of students attended to at the licentiature level. However, the relation between research involvement and number of students at the master's level is direct when moving from the categories of non-SNI licentiate, to non-SNI master, to non-SNI doctor and finally to SNI member (means of students attended, respectively, of 0, 5, 12 and 10). A similar pattern,

[2] The majority of countries participating in the CAP International Study report that their faculty spend less than 20 hours *per* week in teaching activities overall.

although with lower numbers, is also observed between the relation of research involvement and students attended to at the doctoral level. So, a higher level of involvement in research is associated with attending fewer students at the licentiature level, but with more students at the master's and doctoral levels. The numbers of students involved at graduate level, however, are small, particularly at the doctoral level. Notwithstanding this situation, these figures speak to the fact that teaching graduate courses and tutoring students at that level might be mutually reinforced by research, although this relationship is relatively small compared to the relationship between TRIC and hours spent in research activities, as evidenced by the fact that the η^2 reported for the relationship between the TRIC and students attended to at the masters and doctoral levels are considerably lower than that for the relationship between TRIC and hours involved in research (0.066 and 0.037 *vs*. 0.304).

Table 5. Students attended to at the licentiate, master's and doctoral level during current academic year, by faculty's teaching-research involvement (N_T = 1,775)

Teaching-Research Involvement Classification	Students attended to at the licentiature level			Students attended to at the master's level			Students attended to at the doctorate level		
	n	Mean*1	SE	n	Mean*2	SE	n	Mean*3	SE
Non-SNI Licentiature	279	118	6.3	300	0	0.1	300	0	0.0
Non-SNI Masters	694	109	3.5	712	5	0.6	724	0	0.0
Non-SNI Doctorate	222	79	4.9	226	12	1.5	229	3	1.2
SNI Members	344	40	2.9	346	10	0.7	349	3	0.3
Total	1,539	91	2.3	1,584	6	0.4	1,602	1	0.2

*1 $F_{3,1536} = 63.501$, $p < .0001$, $\eta^2 = 0.110$.
*2 $F_{3,1581} = 37.097$, $p < .0001$, $\eta^2 = 0.066$.
*3 $F_{3,1599} = 20.628$, $p < .0001$, $\eta^2 = 0.037$

Academic preference and notions of teaching

Table 6 shows data pertaining to the relationship between TRIC and academic preference. While 36.0% of non-SNI licentiate faculty reported a primary interest in teaching, a similar response came from only 0.8% of SNI members. Conversely, 20.8% of SNI members expressed a primary interest in research, while only 1.6% of non-SNI licentiates reported such a preference. It is interesting to observe that non-SNI licentiate and master faculty do not differ in terms of interest in both activities when "leaning towards teaching" is considered (46.9 *vs*. 47.9%, respectively), though they differ in relation to their

preference to research (15.4 *vs*. 27.2%). So, obtaining a higher degree has an incremental effect in the interest in research when both teaching and research activities are considered. However, teaching interest does not change when moving from a licentiate to a master's degree. Instead, a diminished interest in teaching occurs only when a doctoral degree has been obtained. This pattern is consistent with the previous result regarding how involvement in teaching changes much less than involvement in research when moving from the non-SNI licentiate to the non-SNI master group.

Table 6. Academic preference by teaching-research involvement (%) (N_T = 1,775)

Teaching-Research Involvement Classification	n	Regarding your own preferences, do your interests lie in teaching or in research?				Total
		Primarily in teaching	In both, but leaning towards teaching	In both, but leaning towards research	Primarily in research	
Non-SNI licentiate	311	36.0	46.9	15.4	1.6	100.0
Non-SNI master	743	21.9	47.9	27.2	3.0	100.0
Non-SNI doctor	241	10.8	30.7	51.9	6.6	100.0
SNI member	361	0.8	7.5	70.9	20.8	100.0
Total	1,656	18.4	36.4	38.1	7.1	100.0

Pearson Chi-Square $_9$ = 552.546, $p < .0001$, η directional towards preference = 0.535

Table 7 presents data relative to the way Mexican f-t faculty understands scholarship and the associated nature of academic work. For various statements having to do with such topics, the proportions of respondents that stated agreement or strong agreement with them are specified. As can be observed, the data show that academics who vary in their research involvement report different ways of looking at scholarship and academic work. While non-SNI licentiate, master and doctor faculty stress teaching and tutoring as the core of scholarship, SNI members are somewhat less prone to such statement (70.1%, 73.0% and 66.7% *vs*. 60.1%, respectively). It is quite interesting that the assertion that scholarship includes an application dimension generates high levels of agreement (83.7% overall), from 79.0% for non-SNI doctors to 90.0% for non-SNI masters, but again, less so for SNI members (72.4%). Such figures most surely are related to the fact that Mexican higher education has been traditionally oriented towards the training of professionals. So, by using Boyer's (1990) terms, the scholarships of teaching and application are high overall, the scholarship of integration (preparation of synthesis reports) is

somewhat less seen as part of scholarship by survey respondents (64.8% overall); the scholarship of research, on the other hand, is seen, overall, by a lower percentage (58.7%) of respondents as the best way to define scholarship. As expected, SNI members tend to agree more with such a perspective than non-SNI licentiate faculty (72.1 *vs*. 52.4%, respectively). SNI members, on the other hand, do not agree as strongly as other groups, particularly the non-SNI masters, with the view that faculty have a professional obligation to use their disciplinary knowledge to address societal problems (57.0% *vs*. 82.3%, respectively). Why do SNI members express such a view when compared to the other TRIC groups? Has the dynamics of becoming a SNI member and retaining such status reached a point in which "reality" has moved to lower significance? Or is it that SNI Members consider that generating and applying knowledge is a set of tasks difficult to perform by the same person? Finally, there is a low general agreement (11.6% overall) with respect to teaching and research being incompatible.

Table 7. Proportions of f-t Mexican faculty that agree or strongly agree with various statements on the nature of scholarship, by TRIC group (N_T = 1,775) (%)

Statement	N*[1]	Teaching-Research Involvement Classification				Total
		Non-SNI Licentiates	Non-SNI Masters	Non-SNI Doctors	SNI Members	
Scholarship is best defined as teaching and tutoring students	1,667	70.1	73.0	66.7	60.1	68.8
Scholarship includes the application of academic knowledge in real-life settings	1,673	85.2	90.0	79.0	72.4	83.7
Scholarship includes preparation of reports that synthesize the major trends and findings of my field	1,656	58.8	69.0	67.2	59.6	64.8
Scholarship is best defined as the preparation and presentation of findings on original research	1,663	52.4	55.9	55.5	72.1	58.7
Teaching and research are hardly compatible with each other	1,679	12.4	11.0	13.5	11.0	11.6
Faculty in my discipline have a professional obligation to apply their knowledge to problems in society	1,680	78.4	82.3	77.2	57.0	75.3

*[1] In this table, N is the total number of surveyed academics who answered the question. Percentages for each TRIC group are calculated in relation to the number of academics within each group.

Table 7a. Proportions of f-t Mexican faculty that agree or strongly agree with statements on the quality of teaching and research, by TRIC group (N_T = 1,775) (%)

Statement	N*[1]	Teaching-Research Involvement Classification				Total
		Non-SNI Licentiates	Non-SNI Masters	Non-SNI Doctors	SNI Members	
Faculty with higher degrees do better teaching than faculty without those degrees	1,413	15.5	29.4	42.4	40.3	31.0
The best research is done by faculty members of SNI	1,248	33.3	35.7	28.4	72.4	44.5

*[1] see footnote to Table 7

Table 7a presents the levels of agreement to two statements that show, from another perspective, that faculty from each of the TRIC groups see academic work from different points of view. Specifically, it appears, for faculty that have an opinion on the issues, that judgments of the quality of teaching and research are influenced by the position they have in the TRIC. So, for example, while only one or two in ten of non-SNI licentiate faculty agrees or strongly agrees with a view that assigns better teaching quality to academics with higher degrees, four in ten of the non-SNI doctors or SNI members do. On the other hand, while three out of ten non-SNI licentiates accept that the best research is carried out by SNI members, seven out of ten of this last group expressed the same opinion. These figures, along with those of Table 7, speak of a faculty body that is not homogeneous in terms of the nature of scholarship, academic work and the credentials to perform it at higher quality levels.

Recognition and compensation for academic work

Table 8 presents data related to faculty's participation in two individual incentive and recognition programs in addition to SNI. The various TRIC groups serve to differentiate participation of faculty in institutional incentive programs, which have been largely under the control of higher education institutions and which, like SNI, provide faculty with a monthly additional income. So, while 32.8% of non-SNI licentiates participate in such incentive programs, 72.7% of SNI members take part in them. The Program for the Improvement of the Professoriate (PROMEP, *Programa para el Mejoramiento del Profesorado*), although not providing a monthly payment like the institutional incentive programs or SNI, but rather constituting a recognition

program requiring a minimum of a masters degree and targeted mainly on faculty in state public institutions, it also is sensitive to the TRIC. So, while 33.0% of non-SNI masters participate in this program, more (58.2% and 84.1%) non-SNI doctors and SNI members do. In short, participation in these recognition programs seems to be associated to faculty member's highest degree and, at the same time, involvement in research, rather than in teaching.

Table 8. Proportions of Mexican f-t faculty participating in various recognition programs, by TRIC group (N_T = 1,775) (%)

Teaching-Research Involvement Classification	Institutional Incentive Program*[1]		Desirable Profile, Program for the Improvement of the Professoriate*[2] *[3]	
	N	%	N	%
Non-SNI Licentiates	326	32.8	97	1.0
Non-SNI Masters	760	53.3	385	33.0
Non-SNI Doctors	240	60.8	110	58.2
SNI Members	366	72.7	113	84.1
Total	1,692	54.6	705	40.7

*[1] Pearson Chi-Square $_3$ = 114.918, p < .0001, η, Directional towards Program Participation, 0.261.
*[2] Only f-t faculty working in public state institutions have been considered in this program, as it has been mainly targeted at such institutions (Urbano-Vidales, Aguilar-Sahagún & Rubio-Oca, 2006).
*[3] Pearson Chi-Square $_3$ = 174.721, p < .0001, η, Directional towards Program Participation, = 0.498.

Table 9. Mean monthly income (current Mexican pesos) from various sources for f-t Mexican faculty, by TRIC group (N_T = 1,775)

Teaching-Research Involvement Classification	n	Contractual Income		Incentive Programs' Income		Total Income*[4]	
		Mean*[1]	SE	Mean*[2]	SE	Mean*[3]	SE
Non-SNI Licentiates	318	17,703	557	1,309	220	21,134	741
Non-SNI Masters	751	19,622	365	3,553	273	26,390	634
Non-SNI Doctors	237	24,465	732	6,670	665	33,802	1,118
SNI Members	330	22,458	541	24,221	959	48,768	1,413
Total	1,636	20,523	257	7,734	328	30,954	519

*[1] $F_{3,1632}$ = 26.077, p < .0001, η^2 0.046.
*[2] $F_{3,1632}$ = 368.766, p < .0001, η^2 0.404.
*[3] $F_{3,1632}$ = 146.406, p < .0001, η^2 0.212.
*[4] Total income incorporates other income sources, so it is larger than the sum of the contractual and incentive programs' income, which integrate both institutional and external merit-pay sources.

With recognition that faculty involvement in research activities is stronger than that provided for being involved in teaching, the question could be asked about the extent to which such recognition, in addition to that associated with the highest degree, makes to a difference in income. Table 9 presents data relevant to this question. It can be seen that the more research-involved groups of the TRIC, which are also those with the highest degrees, receive the highest mean contractual incomes: $24,465 and $22,458 Mexican Pesos (MP) for non-SNI doctors and SNI members, *versus* $17,703 and $19,622MP for non-SNI licentiate and master faculty. The difference between the lowest and the highest paid group (non-SNI licentiate and non-SNI doctor groups, respectively) is around 38.2%. The situation with income from incentive programs, however, is much more differentiated. While non-SNI licentiates earn, on average, an extra $1,309 MP *per* month, non-SNI masters earn $3,553, non-SNI doctors, $6,670MP and SNI members, $24,221MP more every month. It can be seen that SNI faculty, on average, have a larger income from the incentive programs in which they participate, than from their contractual income ($24,221MP *vs*. $22,458MP, respectively). Putting together all income sources Table 9 shows that the total monthly income varies from a low of $21,134MP, for non-SNI licentiates, to a high of $48,768MP for SNI members: a difference of 130.8%. This income differentiation identifies two points of interest: first, it favors largely research involvement and, second, it is based largely on the additional income provided by incentive programs.

Incentive income comes from both internal and external institutional sources. While the external incentive program known as SNI was created in 1984, and was targeted at faculty doing research, internal institutional merit-pay incentives were developed several years later and intended to compensate faculty mostly devoted to teaching (Cordero-Arroyo, Galaz-Fontes & Sevilla-García, 2003). Notwithstanding such intentions, the data just presented show that research is by far the activity that is recognized by incentive programs as a whole, so that institutional programs have been unable to counterbalance the additional compensation first awarded to research. Additionally, such data also show that as f-t Mexican faculty increase their professional qualifications and their involvement in research, the less stable is their income, as the contractual share of their total income diminishes from 83.8% to 74.4%, to 72.4%, and finally to 46.1% for non-SNI licentiates, masters, doctors and SNI members, respectively. Is this a planned outcome of federal and institutional policies currently in place? Is this a long-term "healthy" situation for faculty, institutions and Mexican higher education in general?

Personal characteristics associated with TRIC

After having presented data relative to the discriminatory capacity of the TRIC relative to various measures of research and teaching, as well as in relation to academic preference and work recognition and income, we now turn to ask whether the groups identified by the TRIC differ along some personal characteristics. Table 10 presents data on gender and age relative to the four TRIC groups. It shows that female representation is higher amongst non-SNI masters faculty (41.6%), than elsewhere (around 30%). A lower proportion of faculty with doctorates are female, but also females are more teaching oriented, as indicated by their higher proportion of non-SNI masters, relative to the overall female participation rate (41.6% *vs*. 35.7%, respectively). In relation to age, Table 10 shows that, despite the fact that all TRIC groups have a similar age average, of between 49.3 years for non-SNI licentiates and SNI members, to 51.4 years for non-SNI doctors, with this last TRIC group being around two years older than the other TRIC groups.

Table 11 presents data relating TRIC and the time when faculty first entered the academic profession, as defined by having had their first f-t or half-time appointment in a higher education institution. As it can be observed, there has been little change between the date of first entrance period and the last one for all the TRIC groups except non-SNI doctors. Thus, of all non-SNI licentiates, 26.6% entered the academic profession up to 1982, but 28.9% did so during the last period considered. Given the teaching orientation of this group of academics it is natural to conclude that enrollment growth and, on the other hand, a low supply of candidates with higher degrees, is influencing such dynamics. On the other hand, that 31.6% of the non-SNI doctors entered the profession up to 1982, while 19.0% came into higher education during the most recent period, suggests that many of these academics obtained their doctoral degrees while already working in the profession. A point of interest here is why these faculty members, even though they have obtained their doctorates, which is a prerequisite to enter SNI, are not yet members of it. Table 12 presents information relative to the highest degree with which the different TRIC groups first entered the academic profession. It can be observed that the current highest degree, that associated with the TRIC, has been obtained, to a considerable extent, after faculty have already been employed. So, 63.3% of non-SNI master faculty entered academic profession with a licentiate degree, and 50.9% of non-SNI doctors did the same. It is interesting to observe that of all SNI members, 42.1% entered the academic profession already holding a

doctorate, while 23.6% of non-SNI doctor faculty entered the profession under similar conditions. It would appear, then, that obtaining a doctorate while already working in the profession is associated with conditions that make it less probable to enter SNI, despite the fact of the additional income that faculty members of SNI receive. Could it be that non-SNI doctor faculty have engaged more significantly in teaching and that they prefer not to change such work in order to gain entrance to SNI? Could it be that such faculty, after having obtained their doctorates while already working, do not have working conditions that allow them to perform so as to gain access to SNI? Could it be that the doctorates that these faculty obtained did not provide the immediate necessary training and academic capital that allow them to enter SNI? Or could it be that many non-SNI doctors obtained their degrees in order to be eligible to receive higher rewards, but are not really interested in becoming researchers according to SNI criteria? Given the efforts targeted at increasing the highest degree level of in-service faculty, these questions are central in analyzing the public policies associated with such efforts.

Table 10. Gender and age characteristics associated with each TRIC group (N_T = 1,775)

Teaching-Research Involvement Classification	Gender*1		Age*2		
	N	% Female	N	Mean	SE
Non-SNI Licentiates	322	30.4	321	49.3	0.6
Non-SNI Masters	758	41.6	753	49.7	0.3
Non-SNI Doctors	238	31.5	236	51.4	0.6
SNI Members	356	30.6	352	49.3	0.5
Total	1,674	35.7	1,662	49.8	0.2

*1 Pearson Chi-Square $_3$ = 21.047, p < .001, $\acute{\eta}^2$ Directional towards Gender, 0.112
*2 $F_{3,1658}$ = 2.900, p < .05, η0.072, η^2 0.005

Table 11. Time of entry into the academic profession, by TRIC group (%) (N_T = 1,775)

Teaching-Research Involvement Classification	N	Time of Entrance into the Academic Profession*1, *2			
		Up to 1982	1983-1990	1991-1998	1999-2008
Non-SNI Licentiates	308	26.6	21.1	23.4	28.9
Non-SNI Masters	743	22.6	27.3	24.4	25.7
Non-SNI Doctors	237	31.6	26.2	23.2	19.0
SNI Members	355	27.6	24.8	20.3	27.3
Total	1,643	25.7	25.4	23.1	25.7

*1 Date of first f-t or half-time contract in a higher education institution.
*2 Pearson Chi-Square $_9$ = 17.515, p < .05, η, Directional towards Period of Entrance 0.073

Table 12. Highest degree at entry to f-t or half-time faculty in a higher education institution, by TRIC (N_T = 1,775) (%)

Teaching-Research Involvement Classification	N	Highest degree in first f-t or half-time contract*[1]		
		Licentiate	Master's	Doctorate
Non-SNI Licentiates	259	100.0	0.0	0.0
Non-SNI Masters	610	63.3	36.7	0.0
Non-SNI Doctors	212	50.9	25.5	23.6
SNI Members	309	30.4	27.5	42.1
Total	1,390	60.9	26.1	12.9

*[1] Pearson Chi-Square $_6$ = 543.694, $p < .0001$, η directional towards highest degree, 0.536.

Job satisfaction and commitment

Table 13 presents data on the way in which faculty in the various TRIC groups responded to questions related to their perspectives on the academic profession and job satisfaction in general. Irrespective of whether they are teaching- or research-oriented, only one in ten faculty agree or strongly agree with the statement that, if they had to do it again, they would not become an academic. Consistent with such responses, almost nine out of ten academics reported a high or very high level of overall satisfaction with their current job. It appears then, that Mexican faculty are satisfied not only with their current job, but also with their profession in general. Notwithstanding this situation, faculty reported some levels of tension in their jobs, which grow somewhat as research becomes their main activity. So, while 18.1% of non-SNI licentiates agree or strongly agree with the statement that their job is a source of personal strain, 28.7% of SNI members report the same. As it happens, with institutional merit-pay systems, faculty's SNI participation is based upon a performance assessment done every certain number of years, with a real possibility of yielding a negative evaluation, which would mean not receiving, at least for the following year, the additional income that SNI provides; this could entail the loss, together with income from institutional merit-pay, of more than half of their income. Moreover, a lower proportion of SNI Members, when compared to other TRIC groups, is tenured (*e.g.*, 70.7% *vs.* 81.9% of non-SNI doctor academics). Probably associated with both of these situations, a small proportion (about one in ten overall) of Mexican faculty evaluate negatively the attractions for a young person to begin an academic career in their field but, again, this view is stronger for SNI members than for non-SNI licentiates (22.0% *vs.* 9.0%, respectively).

Table 13. Proportions of f-t Mexican faculty that agree or strongly agree with various statements on the academic profession and job satisfaction in general, by TRIC groups (N_T = 1,775) (%)

Statement	N*[1]	Teaching-Research Involvement Classification				Total
		Non-SNI Licentiates	Non-SNI Masters	Non-SNI Doctors	SNI Members	
If I had it to do over again, I would not become an academic	1,674	11.7	9.5	9.3	8.8	9.8
How would you rate your overall satisfaction with your current job?*[2]	1,677	88.9	87.6	83.3	86.8	87.0
My job is a source of considerable personal strain*[3]	1,681	18.1	22.6	26.5	28.7	23.6
This is a poor time for any young person to begin an academic career in my field*[4]	1,669	9.0	11.1	16.3	22.0	13.8

*[1] In this table, N refers to the total number of academics that answered the question. Percentages for each TRIC group are calculated in relation to the number of academics within each such group.
*[2] For this statement the response alternatives were high or very high.
*[3] Pearson Chi-Square $_{12}$ = 32.152, p < .01, η directional towards statement, 0.096.
*[4] Pearson Chi-Square $_{12}$ = 59.017, p < .0001, η directional towards statement, 0.144.

Table 14. Proportion of f-t Mexican faculty that reported their affiliation to various referents to be important or very important, by TRIC group (N_T = 1,775) (%)

Degree to which each of the following affiliations is important to you	N*[1]	Teaching-Research Involvement Classification				Total
		Non-SNI Licentiates	Non-SNI Masters	Non-SNI Doctors	SNI Members	
My academic discipline/field	1,677	96.9	98.2	95.0	97.8	97.3
My unit of assignment (at this institution)*[2]	1,679	94.4	93.3	86.2	81.0	89.8
My institution*[3]	1,681	95.6	96.3	88.8	89.1	93.6

*[1] See footnote to Table 13
*[2] Pearson Chi-Square $_{12}$ = 79.592, η directional towards statement, 0.199.
*[3] Pearson Chi-Square $_{12}$ = 66.950, η directional towards statement, 0.167.

Finally, Table 14 presents data on the level of affiliation reported by Mexican faculty in relation to their academic discipline, their unit of assignment (faculty, school, department, *etc*.) and their institution. As can be observed, all levels of affiliation are high, ranging from 89.8% of respondents stating a high or

very high affiliation with their unit of assignment, to 93.6% reporting the same for their institution and, lastly, to 97.3% stating such affiliation levels with respect to their academic disciplines. Despite this pattern, SNI members report somewhat lowers levels of affiliation for both their unit of assignment (81.0% *vs*. 94.4% when comparing SNI members and non-SNI licentiates) and their institution (89.1% *vs*. 95.6% in the case of SNI members and non-SNI licentiates).

Concluding comments

What have we learned from our exploration based on the TRIC? In this paper it has been shown that teaching and research activities and productivity in Mexican faculty are so related that it is possible to group them in a one-dimension classification scheme, the TRIC that captures significant variations of these two central aspects of academic work. Given the level of training of Mexican faculty, as well as the importance assigned to the highest degree by public and institutional policies, TRIC is highly associated with highest degree and, on the other hand, with membership of the National Researchers' System (SNI), which is a nation-wide merit-pay system based on proven levels of research productivity (refereed publications essentially).

Comparisons of TRIC groups showed that, in the Mexican case and beyond a certain level of teaching activity (around eight hours of classroom instruction and an additional seven of complementary teaching activities *per* week), teaching and research activities are inversely related. The same holds for productivity measures in terms of the number of publications reported in the last three years and the number of undergraduate students taught during the current academic year. When considering the number of graduate students, however, there are signs of a positive relation between teaching and research. The intensity with which graduate teaching takes place, however, is so low that it does not modify the general relationship between teaching and research.

Those members of faculty more involved in research are more recognized and, moreover, have larger incomes than those more involved in teaching. The extra income, however, is based in a disproportionate way on merit-pay systems. Of these, the most important, SNI, is run centrally, so research-oriented faculty are faced with the challenge of having to respond to two, not always aligned, sets of rules in order to maintain their status. This might be related to the fact that, despite high levels of affiliation to the unit in which they work and to their institution, SNI members reported lower commitment levels to both of them than

non-SNI licentiates.

Associated with the way it is structured and its growth, Mexican higher education has continued to recruit faculty without a doctorate or, even more, without a master's degree: four out of ten new faculty members hired during the period 1999-2007 hold a licentiate as their highest degree, while only two out of ten hold a doctorate. This dynamic is creating and reinforcing two worlds of scholarship that, afterwards, institutions and governmental agencies will have to integrate by various professional development programs which, because they are targeted at so large a number of faculty members, will require significant amounts of institutional resources. However, the question remains of to what extent these two worlds will be compatible given that one responds to an institutional teaching-oriented reality while the other is more related to an external agency dedicated to increasing research.

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The Balance between Teaching and Research in the Work Life of American Academics, 1992-2007: is it changing?

Martin Finkelstein*

Introduction: the arbiters of faculty work life

In 1987, the late Burton Clark proposed an elegantly parsimonious sociology of the American academic professions: academic work life in the U.S., he argued, was "nested" in a matrix defined, on the one hand, by the type of institution in which professors worked and, on the other, by the academic disciplines or fields in which they received their doctoral training. Each cell in this matrix defined a slightly different variation on the academic work-role, substantially predictable but based on only these two factors. The work-role variable to which Clark was referring included prominently the balance between teaching and research (in terms of actual time and effort allocation), the type of research undertaken (*e.g.* basic *vs.* applied), the form and quantity of publications produced (*e.g.* research notes, journals articles *vs.* books; sole *vs.* multiple authorships), the work venue (*e.g.* laboratory, office, library, home office), *etc.* The notion was simple enough: individual academic fields provided distinctive and enduring educational socialization experiences during doctoral training that were "carried over" into the subsequent career; and these were reinforced and/or reshaped at the margins by the expectations and organizational structures of the institutional settings in which they pursued their work. From a comparative perspective, this second order institution level, in-service socialization component was what distinguished the American system from other national systems typically characterized by a more basic uniformity in work settings, that is, a university is a university is a university.

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From the moment of its initial articulation, this "matrix theory" of the academic professions gained wide currency as a cogent macro-level lens through which to understand U.S. faculty work activities and behavior. In the ensuing quarter century, however, American higher education has undergone what many consider a radical transformation and/or restructuring (Schuster & Finkelstein, 2006; Slaughter & Rhoades, 2004) in several respects. Most generally, it has witnessed something of a blurring of the lines of demarcation among types of institutions as the research university model (research dollars and publications as the desideratum of academic quality), including expectations that all faculty engage in research and publish, has diffused broadly throughout the system's four-year sector. Former liberal arts colleges are adding master's programs and former comprehensive institutions are adding doctoral programs and seeking (or adopting) "university" status. This increasing homogenization of research expectations could certainly threaten to attenuate differences in teaching and research balance attributable historically to institutional type. Second, the last quarter century has seen a radical "marketization" of academic fields in the university, that is, academic fields have grown and prospered inside the university in direct proportion to their role and commercial value outside it, in the new knowledge-based economy of the 21st century. Those fields that generate resources outside university walls (science and technology-based) and must compete with industry for faculty talent have prospered, while those that compete less well commercially have faltered. That has led some observers to conclude that universities have become bifurcated institutions academically divided between the "haves" and the "have nots" (Slaughter & Rhoades, 2004). It is not clear to what extent this commercial stratification of the academic menu has intensified or attenuated differences among disciplines overall or between disciplines within one or another of the new stratification cells.

Distinct from, albeit related to, these trends in institutional homogenization and academic field commodification, are trends in the restructuring of academic appointments and the demographics of the faculty workforce. Gappa and Leslie (1993), Baldwin and Chronister (2001), Schuster and Finkelstein (2006), Cross and Goldenberg (2009), and Kezar and Sam (2010) have all heralded the ascent of contingent faculty appointments in the United States: the rise first of part-time (in the 1970s and 1980s) and then (in the 1990s and 2000s) of full-time non-tenure track appointments across institutional types and academic fields. While these appointments differ most obviously in their duration and permanence, they differ substantively in their specialization of function: that is, they focus incumbent work activities on a single one of the typical triumvirate of

faculty functions in the post World War II American university; either teaching (predominantly), research (usually related to federal grants), or service (related to directing new academic programs, frequently with an off-campus or distance learning component). To the extent that a "new" majority of faculty in U.S. colleges are now holding appointments that limit their responsibilities to, for example, only one of the historic faculty functions, *e.g.* teaching, suggests, at the least, that one other variable may need to be added to Clark's faculty work prediction equation (a three dimensional matrix?).

And then, there is the matter of gender. The final macro trend of the past quarter century in American (indeed, global) higher education is its increasing feminization. In 1969, about one-quarter of American professors were women; by 2008, that overall figure had reached about 38%. Moreover, among new entrants to the U.S. academic workforce today, nearly half (about 45%) are women. In certain fields of the humanities (English; foreign languages), softer social sciences (psychology, history), and the professions (education, social work, nursing and many of the allied health professions), the majority of instructional faculty are now women. This demographic shift becomes salient when we consider that social science research in the past half century has documented the decisive role of gender in shaping academic work and careers (Finkelstein, 1984; Finkelstein *et al*, 1998): women are more oriented to teaching than men and less oriented to research; they allocated more of their time to teaching, are more student centered than men, they publish less, *etc*. To the extent that they are an increasing presence in the workforce and to the extent that their historically documented work/life differences *vis-a-vis* men persist, then it would appear that gender, as well as type of appointment, may need to be added to institutional type and academic field (assuming the latter's salience persists) as determinants of the work/life of the "new" American professor.

Research questions: the purpose of the proposed study

In light of the original "Clarkian" principles and the potentially disruptive academic trends we have noted in the intervening years, the purpose of the present study is to test the extent to which Clark's formulation still obtains or whether his original formulation needs to be expanded to include new potential predictors of type of appointment and gender as arbiters of the shaping of academic work: in particular the balance that faculty strike between their teaching and research responsibilities.

To be precise, we will address the following questions:

- To what extent do institutional type and discipline continue to shape academic work in much the same powerful way as Clark described in 1987?
- To what extent have type of appointment and gender emerged as an additional set of organizing principles for academic work in the U.S.?

Data source and method

The first seeds of answers to questions like these are contained in a new international survey, the Changing Academic Profession (CAP), undertaken in 2007 as a fifteen year follow-up to the original 1992 Carnegie Foundation International Faculty Survey. For purposes of addressing the research questions posed above, we sought to compare U.S. faculty responses in 1992 and 2007 on five common survey items that serve as indicators of the faculty work role: weekly hours spent in teaching and weekly hours spent on research, total weekly work hours, reported orientation to teaching *vs*. research, articles published over the past three years and to disaggregate those responses by institutional type, academic field, type of appointment and gender. Specifically, we sought to determine whether inter-institutional and inter-disciplinary differences in the above work activities in 1992 were larger, smaller, or about the same as those in 2007. Were those institutional type and interdisciplinary differences affected when type of appointment or gender were controlled in either 1992 or 2007? Were there systematic differences in work activities by type of appointment and gender in 1992 or 2007? If so, how large were those differences, especially relative to those associated with institutional type and academic field? In either year (1992 or 2002) were any differences discerned greater, lesser or the same for new entrants than for experienced faculty?[1]

Population and sampling

The data to examine the balance between teaching and research in the faculty work role were collected from the 1992 Carnegie survey and the 2007 CAP survey data files for the U.S. sample.[2]

The 1992 survey conducted by Philip Altbach and an international faculty team under the auspices of the Carnegie Foundation for the Advancement of

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[1] In Finkelstein *et al*., *The New Academic Generation* (Johns Hopkins , 1998), it was shown that new tends that were barely discernible in aggregate data became striking when that same data was disaggregated by year of entry to the academic profession; that is, that new developments clearly affecting new recruits might be largely hidden by aggregate data.

[2] The 1992 U.S. data file was made available by Professor William Cummings, George Washington University.

Teaching was a twelve page paper survey that was mailed to a random sample of 7,588 U.S. faculty at 40 randomly selected four-year colleges and universities, twelve of which were research universities. Responses were received from 3,588 faculty for a 46.5% response rate. The data file was weighted by gender, tenure status and academic field to ensure broad generalizability to the general four-year collegiate faculty population[3].

In the 2007 CAP Survey, the universe of 4000+ four-year colleges and universities in the U.S. was stratified by two characteristics: size/degree level and control. A total of 80 institutions were selected from among four strata (defined by large/graduate, small/undergraduate, public, and private). Using their faculty lists we determined the proportion of full-time faculty in the population in each of the four institutional strata. A random sample of faculty was selected within each institutional stratum to approximate to their proportions in the population. This approach yielded a total sample of 5,772 faculty at 80 four-year colleges and universities across the United States.

Data collection

The U.S. team contracted the Research Services Division of SPSS Corporation to program and host the on-line American English version of the CAP survey. The survey link with an individually coded identifier was e-mailed to all 5,772 faculty on October 3, 2007. A total of five reminders were sent out electronically between October 15 and December 7, 2007. In March, 2008, a paper version of the survey was mailed to approximately 1,000 of the non-respondents in an effort to capture additional responses from those who were unwilling to respond to an on-line survey. Ultimately, a total of 1,048 responses were received from faculty at nearly 80 institutions for an effective response rate of 21.4%. Subsequent analysis showed that respondents differed modestly from the sample in institutional type (over-representing PhD granting universities and under-representing liberal arts colleges), gender (women were slightly over-represented), and rank (slight over-representation of senior faculty). The data file was therefore weighted by institutional type, academic field, gender and rank to ensure generalizability to the general faculty population.

Dependent variables

Five identical items were selected from the 1992 Carnegie survey and the 2007 CAP survey to serve as dimensions of the teaching and research balance

[3] For further details on technical aspects of the survey, see Altbach (1996).

within the faculty work-role. These included:

(1) total self-reported weekly work hours;
(2) total weekly self-reported hours spent in teaching;
(3) total weekly self-reported hours spent in research;
(4) self-reported orientation to teaching vs. research (ranging from heavily in research to heavily in teaching); and
(5) self-reported published articles in the last three years.

Independent variables

For both surveys, we employed the same independent variables: institutional type; academic field; gender; appointment type and career stage. While the options for institutional type varied somewhat across the two surveys, we dichotomized the institutional type variable for both 1992 and 2007 into universities (including research and doctoral granting) and other four-year institutions. For academic field, we tri-chotomized the data for both 1992 and 2007 into the following four clusters: life and medical sciences; physical sciences and engineering; humanities and social sciences; and other, including the professions. The type of appointment variable was dichotomized as either tenured or tenure-track (career ladder) or contract (non-ladder). For career stage, we used the traditional seven-year probationary period as the criterion to dichotomize respondents into two subgroups: new entrants (seven years or less since first full-time appointment; and senior faculty (including what are usually considered mid-career faculty, *i.e.* those who have spent eight years or more in the profession)

Data analysis

The data analysis proceeded in two stages: a descriptive stage and a multivariate stage as follows.

Descriptive. For each dimension of the faculty work-role in each bookend year, crosstabs were computed for each independent variable categorized as above. The cross tabulations were then compared for observable trends.

Inferential. A series of logistic regression analyses were undertaken for each of the five outcome (dependent) variables. Each logistic regression analysis included three models: an initial model that tested the effects of institutional type and academic field only; a second model to which appointment type and career stage were added; and a third model to which gender was added. In the process of generating the correlation matrix upon which the regression analyses were

conducted, appropriate tests for multicollinearity among predictor variables was conducted.

Prologue to results: trends in academic work, 1970-1992

Before proceeding directly to an examination of the results, it seems necessary, by way of establishing the context for interpreting these findings, to locate for the reader the status of the teaching *vs*. research in the U.S. faculty role for the period immediately prior to the fifteen years period examined here: the period from about 1970-1992 in which American higher education's golden age had begun receding and had been replaced by a period of fiscal constraint and re-examination and assessment. If the 1992 Carnegie survey provides the baseline for the current study, we need to provide the reader with a sense of the baseline that those undertaking the 1992 Carnegie survey had when they took their snapshot of faculty work. We try to do so by using data from earlier U.S. national surveys to provide an overview of the two decades prior to the Carnegie survey.

In the early 1970s, faculty in the U.S. reported an about 40-42 hour work week in national surveys, a figure that rose sharply by the late-1980s to close to 50 hours (with perhaps a quarter reporting 55 or more weekly hours). Most of that rise was attributable to an increase in research hours and publication activity; indeed, the overall rise masked a slight decline in weekly teaching hours. This trend represented the widespread diffusion of the research model throughout the four-year sector of American higher education. This is the period when college rankings, especially by U.S. News and World Report made their debut and focused attention on factors such as faculty credentials, external research dollars generated and faculty publications as key factors in attracting the best students and driving campus positions in the ratings game (Wildavsky, 2010). It is also the period when student consumerism received its biggest boost, the 1972 Amendments to the Higher Education Act of 1965, targeting individual students rather than institutions as the recipients of federal scholarship grants. Ultimately, the confluence of these developments led to unfettered pursuit by students of the most highly rated colleges and reinforced institutional jockeying for ever better positions in the prestige race.

The early 1990's saw something of a teaching correction in American higher education. The decade opened with the publication of Ernest Boyer's widely influential "Scholarship Reconsidered: Priorities of the Professorate". That volume not only decried the knee-jerk embrace of research and decried its displacement of teaching as the overriding focus of most four-year institutions,

but provided a conceptual framework and rationale for expanding conceptions of faculty research and scholarship to include "the scholarship of teaching", a species of legitimation of teaching's importance employing the language of research and scholarship. That clarion call was supported by the increasing disaffection of state legislators and other public officials with undergraduate education, which was increasingly relegated to graduate teaching assistants and other part-time faculty. In several states these concerns effectively translated into higher teaching loads − or at least the enforcement of legal teaching loads − and a concomitant decline in research effort (facilitated, too, by a concurrent decline in federal research support). These trends were reflected in a stabilization or slight regression to earlier (*i.e.* lower) levels of weekly work hours, mostly at the expense of research hours.

This was the context into which the 1992 Carnegie survey introduced itself. And now, thus armed, we turn to the results.

Findings

Descriptive results

Table 1 below reports overall weekly work hours, weekly hours in teaching and in research, teaching *vs*. research orientation, and publications for U.S. faculty in 1992 and 2007. These data appear to confirm the sort of "teaching correction" post-1990 we postulated in the preceding section: weekly time devoted to teaching increased by 12% and research time declined by more than 27% in the fifteen year period, thus allowing for an actual decline in total weekly work hours despite the teaching effort uptick. This re-allocation of effort is reflected in a slight decline in reported orientation to research and a substantial decline in reported publication activity.

Institutional type

When we examine differences in teaching and research effort between institutional types in both 1992 and 2007 (Table 2), we find a consistent pattern of difference between research and non-research institutions in each year: faculty in research institutions spend less time in teaching than their "other four-year" counterparts, they are more research oriented, they publish much more and work longer hours. Moreover, the magnitude of the institutional type differences appears to remain equally large, suggesting that type of institution continues to play a formative role in shaping the character of faculty work.

Table 1. U.S. faculty teaching and research, 1992, 2007: all faculty

		1992	2007	Percent Change '92-'07
		N≈3300	N≈1066	
Teaching hours, weekly		18.68	20.93	**+12.0%**
Research hours, weekly		16.46	11.89	**-27.8%**
Total work hours, weekly		50.93	47.70	-6.3%
Teaching or research oriented	Teaching oriented	49.2%	57.0%	**+7.8%**
	Research oriented	50.8%	43.0%	**-7.8%**
Journal articles published last 3 yrs		6.42	4.10	**-36.1%**

Source: Carnegie Foundation for the Advancement of Teaching (1996); CAP (2009)

Table 2. U.S. faculty teaching and research by institutional type, 1992, 2007

		1992			2007		
		Non-research	Research	% Difference Res vs. Non	Non-Research	Research	% Difference Res vs. Non
		N≈980	N≈2370		N≈611	N≈475	
Teaching hours, weekly		23.43	16.71	-28.7%	24.19	18.20	-24.8%
Research hours, weekly		11.05	18.63	+68.6%	9.05	16.31	+80.2%
Total work hours, weekly		47.83	52.18	+9.1%	47.18	50.31	+6.6%
Teaching or research oriented	Teaching oriented	73.9%	38.9%	-35.0%	72.8%	37.7%	-35.1%
	Research oriented	26.1%	61.1%	+35.0%	27.2%	62.3%	+35.1%
Journal articles published in 3 yrs		3.32	7.53	+126.8%	3.04	6.36	+109.2%

Source: Carnegie Foundation for the Advancement of Teaching (1996); CAP (2009)

In an effort to detect whether any more subtle changes in the power of institutional type may be operating for certain faculty subgroups (but not others) and thus be effectively masked in the aggregated analyses, we sought to repeat the cross tabulation of institutional type and faculty work activities, controlling for career stage. The hypothesis here was that if indeed there was some attenuation in the effect of institutional type on faculty work, it should be most noticeable among the most recent faculty hires. Table 3 reports the effect of institutional type and work activities for faculty in the first seven years of their career only, *i.e.* typical probationary faculty in their first academic appointment. The data here show that while among new hires, the basic pattern of differences in teaching effort, research effort and orientation between research and non-research institutions remains, differences in total weekly work effort between institutional types virtually disappear and publication differentials are

cut in half. This suggests that the spread of the competitive research and publication ethos throughout the four year sector described earlier may indeed be manifesting itself, if not yet in allocation of time to research, in efforts to increase the tangible products of research − scholarly publications.

Table 3. U.S. faculty teaching and research by institutional type, 1992, 2007. New entrants only

		1992			2007		
		Non-research	Research	% Difference Res vs. Non	Non-research	Research	% Difference Res vs. Non
		N≈260	N≈560		N≈177	N≈109	
Teaching hours, weekly		22.37	16.36	-26.9%	26.05	19.61	-24.7%
Research hours, weekly		10.18	20.54	+101.8%	9.79	18.50	+89.0%
Total work hours, weekly		**42.72**	**52.71**	**+23.4%**	**48.89**	**49.34**	**+0.9%**
Teaching or research oriented	Teaching Oriented	69.2%	37.5%	-31.7%	67.5%	32.4%	-35.1%
	Research oriented	30.8%	62.5%	+31.7%	32.5%	67.6%	+35.1%
Journal articles published in 3 yrs		**2.41**	**5.93**	**+146.1%**	**2.62**	**4.57**	**+74.4%**

Source: Carnegie Foundation for the Advancement of Teaching (1996); CAP (2009)

Academic discipline

Table 4 shows weekly hours for teaching, research, and all activities, research orientation and publication in 1992 and 2007 for faculty in four clusters of academic fields: (1) life and medical sciences, (2) physical sciences, mathematics and engineering, (3) humanities and social sciences, and (4) other fields, including the professions (health sciences as well as law, architecture, education and business). In 1992, the position of the four disciplinary clusters is roughly as expected: faculty in the natural sciences (life sciences and physical sciences combined) spend less time teaching, more on research, work more hours overall, are more research oriented and publish nearly twice as much as their colleagues in the humanities and social sciences and other fields, including the professions (although the relative position of the life and physical sciences changes slightly from item to item). By 2007, the basic pattern persists, with, however, some notable exceptions: the gap in overall work hours and research hours favoring natural scientists (the former a function primarily of their greater effort allocated to research) narrows as do differences in research orientation and, to a lesser extent, publications. While disciplinary differences remain, they

appear, like differences attributable to institutional type, to be somewhat attenuated.

Table 4. U.S faculty teaching and research by academic field, 1992, 2007

		1992				2007			
		Life & Medical	Physics & Engineer-ing	Social Sci. & Humani-ties	Other (incl. Profess-ions)	Life & Medical	Physics & Engineer-ing	Social Sci. & Humani-ties	Other (incl. profess-ions)
		N≈1035	N≈590	N≈1025	N≈675	N≈230	N≈195	N≈333	N≈300
Teaching hours, weekly		13.44	20.01	21.62	21.09	18.83	19.20	22.50	21.97
Research hours, weekly		18.47	19.40	14.67	13.32	12.62	14.22	12.00	9.77
Total work hours, weekly		52.54	51.77	49.16	50.07	48.80	47.83	47.97	46.69
Teaching or research oriented	Teaching oriented	42.7%	40.4%	52.0%	62.7%	53.9%	52.3%	54.0%	65.8%
	Research oriented	57.3%	59.6%	48.0%	37.3%	46.1%	47.7%	46.0%	34.2%
Journal articles published last 3 yrs		8.59	7.83	4.16	4.68	5.49	5.28	3.07	3.25

Source: Carnegie Foundation for the Advancement of Teaching (1996); CAP (2009)

Gender

Table 5 displays gender differences in the focal faculty role activities in 1992 and 2007. The pattern that emerges in both 1992 and 2007 is largely as expected: men spend less time in teaching and more time in research than female colleagues; they are more oriented to research and publish much more. Two points are worthy of note. First, the magnitude of the differences between the genders seems smaller than between the institutional types and academic fields overall. Second, the differences are especially small in overall weekly hours devoted to work (indeed by 2007, women reported working longer hours than men) and the gender disparity in publications seems to narrow by 2007. In an effort to further locate and analyze these gender differences, Table 6 shows the gender differences on the five focal work dimensions for research university faculty only (controlling for institutional type) and Tables 7a and 7b show the gender differences after controlling for academic discipline. The message of Table 6 is clear: at research universities (*vis-à-vis* the general institutional population), gender differences have to some extent always been attenuated; but, more to the point, by 2007, gender differences in weekly hours devoted to work, research orientation and publications had virtually disappeared. The data in

Tables 7a and 7b suggest that in no small part the attenuation of gender differences in research orientation and publications is likely to be attributable to women faculty in the humanities and social sciences and the professions who have largely eliminated any gender disparities in publication in those fields. These findings are largely consistent with the trends in faculty research productivity noted by Schuster and Finkelstein (2006) in their recent overview of the evidence gleaned from more than three decades of national faculty surveys in the United States.

Table 5. U.S. faculty teaching and research by gender, 1992, 2007

		1992		% Difference Male vs. Female	2007		% Difference Male vs. Female
		Female	Male		Female	Male	
		N≈880	N≈2400		N≈400	N≈650	
Teaching hours, weekly		20.55	18.03	-12.3%	22.51	20.00	-11.2%
Research hours, weekly		13.51	17.50	+29.5%	10.26	13.03	+27.0%
Total work hours, weekly		**49.93**	**51.26**	**+2.7%**	**48.50**	**47.41**	**-2.2%**
Teaching or research oriented	Teaching oriented	57.2%	46.3%	-10.9%	62.6%	53.3%	-9.3%
	Research oriented	42.8%	53.7%	+10.9%	37.4%	46.7%	+9.3%
Journal articles published in 3 yrs		**4.26**	**7.14**	**+67.6%**	**3.47**	**4.50**	**+29.7%**

Source: Carnegie Foundation for the Advancement of Teaching (1996); CAP (2009)

Table 6. U.S. faculty teaching and research by gender. Research Universities only

		1992		% Difference Male vs. Female	2007		% Difference Male vs. Female
		Female	Male		Female	Male	
		N≈570	N≈1780		N≈168	N≈302	
Teaching hours, weekly		18.02	16.31	-9.5%	19.42	17.53	-9.7%
Research hours, weekly		**16.35**	**19.37**	**+18.5%**	**15.24**	**17.01**	**+11.6%**
Total work hours, weekly		**52.03**	**52.22**	**+0.4%**	**50.63**	**50.28**	**-0.7%**
Teaching or research oriented	Teaching oriented	44.4%	37.1%	-7.3%	38.4%	36.8%	-1.6%
	Research oriented	**55.6%**	**62.9%**	**+7.3%**	**61.6%**	**63.2%**	**+1.6%**
Journal articles published in 3 yrs		**5.36**	**8.19**	**+52.8%**	**6.15**	**6.49**	**+5.5%**

Source: Carnegie Foundation for the Advancement of Teaching (1996); CAP (2009)

Table 7a. U.S. faculty teaching and research by academic field and gender, 1992

		Life & Medical		Physics & Engineering		Social sciences & Humanities		Other (incl. professions)	
		F	M	F	M	F	M	F	M
		N≈320	N≈ 793	N≈58	N≈553	N≈326	N≈737	N≈230	N≈476
Teaching hours, weekly		15.58	12.42	23.73	19.33	22.62	20.53	21.42	20.47
Research hours, weekly		13.84	17.02	14.71	17.88	11.89	14.87	11.17	13.47
Total work hours, weekly		49.38	52.23	49.73	51.41	48.31	48.46	48.74	49.37
Teaching or research oriented	Teaching oriented	49.5%	39.8%	58.5%	38.6%	56.1%	50.2%	69.4%	59.5%
	Research oriented	50.5%	60.2%	41.5%	61.4%	43.9%	49.8%	30.6%	40.5%
Journal articles published last 3 yrs		5.26	8.39	4.43	7.33	3.25	4.15	2.95	4.44

Source: Carnegie Foundation for the Advancement of Teaching (1996)

Table 7b. U. S. faculty teaching and research by academic field and gender, 2007

		Life & Medical		Physics & Engineering		Social sciences & Humanities		Other (incl. professions)	
		F	M	F	M	F	M	F	M
		N≈121	N≈126	N≈46	N≈159	N≈132	N≈202	N≈112	N≈192
Teaching hours, weekly		21.35	15.64	20.85	18.27	21.51	22.61	23.49	19.98
Research hours, weekly		9.57	13.90	9.35	14.74	10.55	12.41	10.25	9.37
Total work hours, weekly		47.74	49.35	47.53	48.44	45.54	48.80	50.25	42.61
Teaching or research oriented	Teaching oriented	67.5%	41.0%	70.8%	45.8%	54.1%	53.4%	62.6%	67.6%
	Research oriented	32.5%	59.0%	29.2%	54.2%	45.9%	46.6%	37.4%	32.4%
Journal articles published last 3 yrs		3.90	5.49	3.70	4.42	2.46	3.46	3.24	2.66

Source: CAP (2009)

Type of appointment

Table 8 shows the differences in the focal faculty role activities in 1992 and 2007 by type of appointment: tenured and tenure-track (often referred to as *career* ladder) *vs*. non-tenure track (*non-ladder)*. The pattern of differences in 1992 is minimal in all but two respects: most notably, there is a sharp differential in publication activity in the expected direction with tenured and tenure track faculty publishing more than their contract colleagues by nearly 50%; and somewhat incongruously, it is contract faculty that taught nearly 10% less than

the tenured and tenure-track faculty.[4] There is little appreciable difference in either orientation to teaching *vs*. research or in weekly effort devoted to research. By 2007, both the scope and absolute magnitude of differences in role activities had strikingly expanded: large differences were discernible in all areas except weekly teaching hours, including a decided gap in research orientation, weekly research effort and the previous publication gap between appointment types had increased. This suggests that relatively muted differences had developed into a substantial work-role differentials by 2007.

Table 8. U.S. faculty teaching and research by appointment type, 1992, 2007

		1992			2007		
		Contract	Tenured/ On-track	% Difference Tenure vs. contract	Contract	Tenured/ On-track	% Difference Tenure vs. contract
		N≈704	N≈2804		N≈360	N≈718	
Teaching hours, weekly		17.04	18.72	+9.9%	19.98	20.58	+3.0%
Research hours, weekly		14.56	15.19	+4.3%	8.49	12.84	+51.2%
Total work hours, weekly		49.29	50.31	+2.1%	43.78	48.76	+11.4%
Teaching or research oriented	Teaching oriented	48.0%	49.5%	+1.5%	70.7%	49.6%	-21.1%
	Research oriented	52.0%	50.5%	-1.5%	29.3%	50.4%	+21.1%
Journal articles published in 3 yrs		4.54	6.03	+32.7%	2.32	4.18	+80.2%

Source: Carnegie Foundation for the Advancement of Teaching (1996); CAP (2009)

When we examine the scope and magnitude of the role activities gap controlling for career stage (Table 9), we find that new entrants in 1992 largely reflected the aggregate (except for a decidedly smaller gap in publication activity), while in 2007 the gap between contract and tenured/tenureable faculty among new entrants *vis-à-vis* more senior faculty had expanded especially in the areas of weekly research effort and publication, (although inexplicably contract faculty also seem to teach 10% less than their tenureable colleagues). This suggests, at least with respect to research effort and publication activity, that the accentuation of appointment type differences was especially visible among the

[4] This unexpected (at least in terms of direction) teaching differential may reflect the disproportionate number of contract faculty in this earlier period with research as their principal activity, especially at the research universities. Such faculty typically teach much less (Schuster & Finkelstein, 2006).

newest entrants to the profession. The data in Table 10, which controls for institutional type, shows that the appointment type related gap in work activities is largely replicated in research universities where differences in research effort, weekly work hours and research orientation persist among different types of full-time faculty appointees, while the gap in publication activity is somewhat attenuated. This suggests that irrespective of appointment type, there is a modestly durable institutional type effect.

Table 9. U.S. faculty teaching and research by appointment type, 1992, 2007. New entrants only

		1992		% Difference Tenure vs. contract	2007		% Difference Tenure vs. contract
		Contract	Tenured/ On-track		Contract	Tenured/ On-track	
		N≈375	N≈479		N≈155	N≈159	
Teaching hours, weekly		17.15	18.56	+8.2%	20.34	22.78	+12.0%
Research hours, weekly		15.59	15.26	-2.1%	8.81	14.25	+61.7%
Total work hours, weekly		49.57	47.76	-3.7%	44.33	49.62	+11.9%
Teaching or research oriented	Teaching oriented	43.4%	51.2%	+7.8%	70.8%	47.1%	-23.7%
	Research oriented	56.6%	48.8%	-7.8%	29.2%	52.9%	+23.7%
Journal articles published in 3 yrs		4.31	4.89	+13.5%	1.87	3.55	+89.8%

Source: Carnegie Foundation for the Advancement of Teaching (1996); CAP (2009)

Table 10. U.S. faculty teaching and research by appointment type, 1992, 2007. Research Universities only

		1992		% Difference Tenure vs. contract	2007		% Difference Tenure vs. contract
		Contract	Tenured/ On-track		Contract	Tenured/ On-track	
		N≈496	N≈1995		N≈97	N≈394	
Teaching hours, Weekly		14.85	16.93	+14.0%	16.58	18.26	+10.1%
Research hours, Weekly		16.34	16.94	+3.7%	11.01	16.53	+50.1%
Total work hours, Weekly		50.90	51.42	+1.0%	44.78	51.06	+14.0%
Teaching or research oriented	Teaching oriented	40.3%	38.6%	-1.7%	60.8%	31.2%	-29.6%
	Research oriented	59.7%	61.4%	+1.7%	39.2%	68.9%	+29.7%
Journal articles published in 3 yrs		5.27	7.05	+33.8%	4.10	6.02	+46.8%

Source: Carnegie Foundation for the Advancement of Teaching (1996); CAP (2009)

Table 11. U. S. faculty teaching and research by appointment type and gender, 1992, 2007

		1992				2007			
		Contract		Tenure/On-track		Contract		Tenure/On-track	
		F	M	F	M	F	M	F	M
		N≈263	N≈438	N≈673	N≈2128	N≈154	N≈197	N≈245	N≈469
Teaching hours, Weekly		19.35	15.70	20.30	18.24	20.05	19.97	22.98	19.33
Research hours, Weekly		12.48	15.86	12.61	15.96	8.97	8.37	10.68	14.00
Total work hours, Weekly		48.39	49.85	49.02	50.66	44.32	43.70	49.54	48.43
Teaching or research oriented	Teaching oriented	53.1%	44.8%	58.8%	46.6%	73.3%	67.8%	54.3%	47.1%
	Research oriented	46.9%	55.2%	41.3%	53.4%	26.7%	32.2%	45.7%	52.9%
Journal articles published last 3 yrs		3.16	5.32	4.34	6.50	2.18	2.52	3.81	4.37

Source: Carnegie Foundation for the Advancement of Teaching (1996)

Table 11 shows the work-role gap in 1992 and 2007 for contract vs. tenureable faculty by gender. There are few surprises in the overall data, with a few notable exceptions: the persistent gender gap in weekly teaching and research effort and in orientation to research that is visible in the aggregate (Table 10) and among tenured and tenure track faculty in 2007 and appears to persist across both institutional types (Table 6) and academic fields (Tables 7a and 7b) largely disappears among contract faculty in 2007. Male contract faculty teach about the same amount − twenty hours weekly − in 2007 as female contract faculty and spend about the same amount of time − nine hours weekly − in research; and the gender gap in research orientation is the lowest among any faculty subgroup defined by institutional type, academic field, and type of appointment. This is in stark contrast to the gender gap for tenured and tenure-track faculty which remains relatively large in 2007. The only area in which the gender gap among contract faculty surpasses that of tenured and tenure track faculty is in publication activity, where men publish more than women by nearly 40%. That that type of appointment appears to neutralize the persistent effects of gender on work-role definition suggests clearly and persuasively that appointment type may now serve as an independent arbiter of work-role definition.

Inferential results

Table 12 displays the results of the final (third) model of the logistic regression analyses for all five dependent variables for 1992. At first

inspection, the results provide clear and resounding empirical confirmation of the basic Clark conceptualization: both institutional type and academic field emerge as significant predictors of all five faculty work dependent variables, although between the two, institutional type was more powerful. In 1992 faculty members at a research university were about five times more likely than those at another type of four-year institution to be highly oriented to research (rather than teaching) and to expend a large weekly effort on research; they were three times more likely to have published above the median that faculty at other four-year institutions; about 1.5 times as likely to work above the median number of weekly hours; and about one-third as likely to teach above the median number of weekly hours. Less powerfully, 1992 faculty members in the natural sciences were about twice as likely as those outside the natural sciences to be oriented to research (rather than teaching), to devote more than the median weekly number of hours to research and to publish more than the median number of articles. They were about half as likely as non-scientists to teach above the median number of weekly hours; and no different from non-scientists in total weekly work hours.

Table 12. Logistic regression, predictors of work-role: 1992

	Teaching Hours (X^2=293.668, df=7, p<=.000)		Research Hours (X^2=310.082, df=7, p<=.000)		Total Working Hours (X^2=30.999, df=7, p<=.000)		Articles Published (X^2=194.174, df=7, p<=.000)		Teaching/research Orientation (X^2=339.283, df=7, p<=.000)	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Institutional types*1	.000***	.367	.000***	4.731	.001**	1.469	.000***	3.073	.000***	5.009
discipline: life/medical or not*2	.000***	.344	.000***	1.487	.053	1.261	.000***	1.882	.000***	1.984
discipline: physical sciences or not	.010**	.726	.000***	2.342	.238	1.182	.002**	1.615	.000***	2.318
discipline: humanities	.561	1.062	.095	1.199	.427	.907	.011*	.720	.000***	1.581
appointment types*3	.537	1.069	.157	1.159	.405	1.101	.052	1.279	.624	.952
career age*4	.255	.894	.025*	1.243	.724	.963	.121	.832	.109	1.160
gender*5	.000***	.705	.000***	1.524	.052	1.221	.000***	1.453	.000***	1.391

*1 Coded as "0" = other four-year institution and "1" = research university
*2 Coded as "0"= no and "1" = yes
*3 Coded as "0" = contract and "1" = tenured/on-track
*4 Coded as "0" = senior and "1" = new entrants
*5 Coded as "0" = female and "1" = male
Source: Carnegie Foundation for the Advancement of Teaching (1996)

Beyond institutional type and academic field, gender emerges, even as early as 1992, as a significant arbiter of work-role behavior almost on a par with academic field (a close third). Male faculty members in 1992 were about one and one-half times as likely as females to be above the median in weekly research hours, in research orientation and in publication; conversely they were about 3/4 as likely to be above the median in weekly teaching hours. Type of academic appointment is, however, largely invisible as a determinant of academic work-role in 1992: contract faculty were no more or no less likely than tenured and tenure-track (career ladder) faculty to expend any greater (or lesser) effort in teaching, research, the overall job or to publish more.

Table 13 displays the results of the final (third) model of the logistic regression analyses for all five dependent variables for 2007. The Exp B values suggest first that while the determinative power of institutional type persists across four of the five dimensions of the work-role, it is slightly attenuated. The only dependent variable upon which the predictive power of institutional type remains equally strong is faculty orientation to research: a 2007 faculty member at a research university is still about five times more likely than one at another four-year institution to be above the median in research orientation. They are slightly less likely, however, than a faculty member in 1992 to be above the median in research hours (Exp B = 2.7 *vs*. 3.3) and publications; (Exp B = 3.7 *vs*. 4.0) and show no significant difference from other four-year institution faculty in total work hours (they were significantly higher in 1992). The determinative power of both academic field and gender appear to persist at about the same level of power: Exp B in the neighborhood of 1.5 for scientists *vs*. non-scientists and for men *vs*. women on research orientation, teaching and research hours and publications.

The new and big story revealed by Table 13 is the emergence of type of appointment as a powerful predictor of work-role behaviors (nearly) rivaling academic field and gender as second only to institutional type as an arbiter of academic work. The table shows that a career ladder (tenured or tenure-track) faculty member, who in 1992 showed no visible differences on any of the five dimensions of academic work from a contract faculty member, was by 2007 two and half times more likely than a contract faculty member to be above the median in research orientation and weekly research hours, twice as likely as a contract faculty member to be above the median in publication and one and a half times as likely as a contract faculty member to be above the median in total weekly work hours. This suggests that by 2007 appointment status had developed very quickly as a fourth pillar defining the complexion of academic work.

Table 13. Logistic regression, predictors of work-role, 2007

	Teaching Hours (X^2=66.217, df=7, p<=.000)		Research Hours (X^2=99.085, df=7, p<=.000)		Total Working Hours (X^2=23.451, df=7, p<=.001)		Articles Published (X^2=53.191, df=7, p<=.000)		Teaching/research Orientation (X^2=153.985, df=7, p<=.000)	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Institutional types	.000***	.393	.000***	3.774	.698	.944	.000***	2.670	.000***	5.132
discipline: medical or not	.013*	.619	.680	1.087	.030*	1.483	.011*	1.876	.007**	1.677
discipline: physical sciences or not	.008**	.566	.012*	1.708	.035*	1.513	.244	1.365	.007**	1.748
discipline: humanities	.916	1.018	.166	1.294	.143	1.279	.410	.836	.001**	1.842
appointment types	.359	.871	.000***	2.041	.001**	1.646	.000***	2.534	.000***	2.684
career age	.216	1.205	.541	1.102	.724	.950	.340	1.209	.655	1.070
gender	.006**	.677	.004**	1.528	.111	.806	.634	1.090	.022*	1.385

Source: CAP (2009)

Discussion and conclusions

Based on the above analyses, what then can we say first, most generally, about the changing balance of teaching and research in American higher education? In the past 15 years, we have suggested that a rebalancing of teaching and research towards teaching is observable. The self-reported total number of weekly hours devoted to academic work has stabilized or declined slightly: teaching orientation and hours have increased across the board; research hours have declined across the board (although there has been a much smaller decline in observable research orientation); and publication volume and rate has declined, but is distributed more widely within the four-year system.

Within the context of this broader teaching "correction," which can be interpreted as nothing more than a swing of the pendulum (although, to be sure, it may be a lengthy swing), what can we say more fundamentally about the factors that shape academic work in the United States? To what extent do Burton Clark's observations of a quarter century ago still hold? To what extent do they need to be modified or even supplanted? The results of our analyses suggest several layers of conclusions. Most generally, at the macro level, they suggest that institutional type and academic field remain powerful arbiters shaping how faculty members go about their work. Moreover, our analyses

suggest that even as Professor Clark wrote, gender had already emerged as a nearly co-equal third axis shaping academic work, both within institutional and disciplinary settings.

By 2007, however, while institutional type, academic field and gender persist as arbiters of academic work, the available evidence suggests that type of appointment has emerged − and very quickly − as a major shaper of the academic work-role, second only to institutional type. This is the single most dramatic and far reaching conclusion of this analysis. Clearly, in the past 15 years, new types of full-time appointments, which were just emerging in the 1990s have become major factors in the academic workplace, not only as a function of their rapidly growing numbers, but also in terms of the powerful definition, or redefinition, that they give to the academic work-role, across institutional and disciplinary settings and even within the boundaries of gender socialization. As a fourth arbiter of the complexion of academic work has emerged, the available evidence suggests some subtle shifts in their interactions. There is some evidence that gender differences are being attenuated by the power of institutional type (*e.g.* by the elimination of many differences, especially in publication behavior at research universities) and appointment type (males and female work patterns differ less in contract appointments than in tenure-track appointments). There is even some evidence that the power of institutional type is attenuating slightly as publication expectations spread more uniformly across the system, even in the midst of a "teaching correction." There is some further evidence that career stage may be entering the picture, insofar as new entrants to the profession may differ less among themselves in their work orientation and behavior than their senior colleagues.

Taken together, the findings suggest that we are witnessing an increasing differentiation of academic work. If a quarter of a century ago, Professor Clark could explain half the variance in a professor's work life based on only two bits of information (institutional type and academic field), we can say with some confidence that he would need to add at least two additional contributors today: gender and appointment type. And perhaps most significantly, the newly emergent arbiter of academic work, appointment type, promises increasing specialization in the work-role rendering questions of teaching and research balance increasingly moot (or rather increasingly irrelevant to an ever larger segment of the U.S. instructional faculty.

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Conclusion

Changes and Realities in Teaching and Research Activities of the Academy

Futao Huang*

The Research Institutes for Higher Education (RIHE) of Hiroshima University and of Hijiyama University in Hiroshima jointly organized the international conference entitled "The Changing Academic Profession in International and Quantitative Perspectives: A Focus on Teaching and Research Activities," from January 13-14, 2010. This conference was the fourth and final conference to be held in Hiroshima as part of the Changing Academic Profession (CAP) Project. At the conference, 15 speakers from 9 countries made presentations, and with participants from across Japan, approximately 60 people attended the conference.

The major theme was proposed to focus mainly on the teaching and research activities of the academic profession in each country, mainly based on the major findings from the national surveys of 2007-2008. In reality, the presentations and discussion covered more diverse topics and included,

- the relationship between teaching, research, and learning,
- an analysis of research productivity,
- the correlation between teaching, research and administration, and
- the special factors contributing to service activities.

All these topics were touched on at diverse levels and from a range of perspectives. At an international level, Prof. Arimoto argued that, in a knowledge-based society the necessity to integrate research and teaching activities, which is based on the concept of the Humboldtian model of the university, should be recognized. By using data for a sub-group of countries,

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Prof. Cummings made a comparative study of the most important factors affecting differential research productivity in the USA, Japan, Korea, Australia and Hong Kong. At a system level, Prof. Rostan's presentation was mainly concerned with a comparative study of Italy with other major European countries. He provided a relatively gloomy picture of the academic profession in his country due to the reforms relating to the Bologna process. In contrast, in South Africa, Prof. Higgs described significant changes that are resulting in a transformation of higher education and the great changes that still need to be achieved.

From the presentations and discussion it was evident, in the conference, that a more refined analysis of the convergence-divergence debate on teaching and research activities was being made within and between systems by a number of speakers by the use of various sub-groups. Exemplifying this was a case study of Germany by institution and academic rank (professorial and junior staff), in which Prof. Teichler emphasized that there has been a narrowing gap in the differences between professors and junior staff as well as in those working at universities and Fachhochschulen, but substantial differences still remained over the period 1992-2007 in Germany.

Prof. Huang and Dr. Li, in a case study of China by type of institution and by academic rank, argued that there seems to be a clear division in the character of academic work between different institutions and between different academic ranks in Chinese higher education institutions especially since 1998 when a quick and fast expansion in higher education has been achieved.

Prof. Hasegawa and Prof. Ogata reported on Japan's academic profession with a focus on teaching and research activities by institution and by academic discipline. They showed that, similarly, there is in Japan a clear division in the character of the academic work between the national research universities and private non-research universities as well as between different academic disciplines in recent years.

A further case study of Japan by Prof. Fukudome and Dr. Kimoto used a range of international, comparative perspectives to show that for age cohorts and by gender there exist diverse models for faculty development. Though some changes are happening concerning teaching and research by female academics, a great disparity could still be found between male academics and female academics in Japan.

Prof. Zain from Malaysia focused on the research, teaching, and administration of academic staff by rank and academic discipline. His sophisticated analysis identified factors affecting the ability of Malaysian

academics to achieve international prestige and to make academic impact at an international level.

A special case study by Prof. Shin focused on the service work of Korean academics in a comparative perspective by institution, career, and gender, He argued that, apart from different perceptions of the definition of service by institution, career, and gender, one of the important conclusions is that Korean academics are more actively involved with scientific service, but less with community activities than academics elsewhere.

Prof. Galaz-Fontes presented a case study of Mexico with a focus on teaching and research by the minority full-time faculty by level of degree and by membership of the national system. He concluded that there has been an intensified separation between teaching and research and a creation of two different academic worlds due to the implementation of public policies.

An analysis by Prof. Finkelstein, of total weekly work hours, teaching orientation, and numbers and rate of publications by the USA academic profession in terms of institution, gender, and discipline, found that in the past 15 years, there has been a rebalancing of teaching and research towards teaching in the USA. Academic work in the USA has become increasingly complicated and diversified for various sub-groups over the period 1992-2007.

Additionally, some other interesting topics and questions attracted discussion, including the following issues.

- Should the Humboldtian ideal be pursued even in countries in which mass- or universal-access higher education systems have been established?
- Do teaching and research activities mutually reinforce each other, or are these activities substantially un-related or disaggregated?
- To what extent have significant changes happened to both teaching and research activities of the AP, in the USA and elsewhere, over the last 15 years?
- What factors have affected the changing pattern of academic work, especially teaching and research activities? And
- What changes will happen to the academic profession's orientations or preferences towards teaching and research as well as other activities in countries like the USA and Mexico in the future?

Compared with all the previous conferences which have been held in Hiroshima, we have gained some clearer perceptions from both presentations and discussions; in particular these relate to a number of important aspects.

- There has been a widening gap between teaching and research activities by the academic profession evident not only among different systems, but also within systems by sub-group.
- The separation between teaching and research might be attributed to various factors depending on different countries. However, in some countries, such as Italy, South Africa, Malaysia, and Mexico, national HE reforms and public policies seem to have played a central role in substantially affecting the changing pattern of teaching and research of the AP. Some of them have brought healthy changes to the AP, while others have not.
- Many contributory relations, including supporting systems, national policies, domestic and international connections, *etc*., are of great importance in stimulating research productivity.
- Most countries, except notably the USA, have shown an increase in research productivity while devoting rather less time to research and more time to teaching.

Although four international conferences on the changing academic profession have been held in Hiroshima since 2006, there remain many issues to be dealt with in the future. Three of the more important are listed below.

- What models or patterns can be identified through refined analyses of the academic profession at national levels and especially within systems for various sub-groups?
- What role should the academic profession seek to play in this changing world?
- What implications can our academic outcomes have for social, political and legal decisions which might lead to positive and healthy impacts on the academic profession in individual countries?

Appendices

Appendix 1: Conference Program

The Changing Academic Profession in International and Quantitative Perspectives: A Focus on Teaching & Research Activities

Date: January 13-14, 2010
Venue: Hiroshima Garden Palace

Wednesday, January 13

8:30 - Registration

*** **Opening Ceremony** ***

9:00 - 9:20 **Opening Remarks**
Toshimasa Asahara, President, Hiroshima University, Japan
Susumu Takahashi, President, Hijiyama University, Japan
Shinichi Yamamoto, Director & Professor, Research Institute for Higher Education, Hiroshima University, Japan
Akira Arimoto, Director & Professor, Research Institute for Higher Education, Hijiyama University, Japan

*** **Keynote Speeches** ***

Chairs:
Takekazu Ehara, Professor, Institute for Teaching and Learning, Ritsumeikan University, Japan
Jesús F. Galaz-Fontes, Professor of Education, Autonomous University of Baja California, Mexico

9:20 - 9:50 **Keynote Speech 1**
"Differentiation and Integration of Research, Teaching and Learning in the Knowledge Society"
Akira Arimoto, Director & Professor, Research Institute for Higher Education, Hijiyama University, Japan

9:50 - 10:20 **Keynote Speech 2**
"Academic Productivity in the Pacific Rim"
William K. Cummings, Professor of International Education and International Affairs, The George Washington University, USA

10.20 - 10:50 **Keynote Speech 3**
"Teaching and Research in Germany: narrowing the gaps between institutional types and staff categories?"
Ulrich Teichler, Professor & former Director, International Centre for Higher Education Research Kassel (INCHER-Kassel), The University of Kassel, Germany

10:50 - 11:00 Q & A

11:00 - 11:15 Coffee Break

*** **Presentations 1-2** ***

11:15 - 11:45 **Presentation 1: Italy**
"Research and Teaching in a Changing Environment: the academic work in Italy"
Michele Rostan, Professor & Director, Center for Study and Research on Higher Education Systems, The University of Pavia, Italy

11:45 - 12:15 **Presentation 2: South Africa**
"Teaching and Research Activities in South African Universities"
Philip Higgs, Research Professor, School for Graduate Studies, The University of South Africa, South Africa

12:15 - 12:30 Discussion

12:30 - 13:30 Lunch

*** **Presentations 3-8** ***

Chairs:
Tsukasa Daizen, Professor, Research Institute for Higher Education, Hiroshima University, Japan
Martin Finkelstein, Professor, Seton Hall University, USA

13:30 - 14:00 **Presentation 3: China**
"Teaching and Research Activities in the Chinese Academics"
Futao Huang, Professor, Research Institute for Higher Education, Hiroshima University, Japan
Min Li, Research Fellow, Research Institute for Higher Education, Hiroshima University, Japan

14:00 - 14:30 **Presentation 4: Hong Kong**
"Explaining Preferences of Hong Kong Academics toward Research and Teaching"
Gerard Postiglione, Professor & Head, Division of Policy, Administration and Social Sciences, Faculty of Education, The University of Hong Kong, Hong Kong, China
Li-fang Zhang, Associate Dean, Faculty of Education, The University of Hong Kong, Hong Kong, China
Shiru Wang, Postdoctoral Fellow, Division of Policy, Administration and Social Sciences, Faculty of Education, The University of Hong Kong, Hong Kong, China
Hei-hang Hayes Tang, Ph.D. Student, Division of Policy, Administration and Social Sciences, Faculty of Education, The University of Hong Kong, Hong Kong, China

14:30 - 15:00 **Presentation 5: Japan**
"Convergence and Divergence of Teaching and Research Activity of Japanese Academic Profession"

Yusuke Hasegawa, Assistant Professor, Research Institute for Higher Education, Hijiyama University, Japan
Naoyuki Ogata, Professor, Research Institute for Higher Education, Hiroshima University, Japan

15:00 - 15:15 Coffee Break

15:15 - 15:45 **Presentation 6: Japan**
"Teaching and Research in Japanese Academic Profession: Focusing on Ages and Gender"
Hideto Fukudome, Associate Professor, Research Institute for Higher Education, Hiroshima University, Japan
Naomi Kimoto, Assistant Professor, Comprehensive Education Center, Prefectural University of Hiroshima, Japan

15:45 - 16:15 **Presentation 7: Malaysia**
"Presenting Malaysian Academics to the World: what's holding us back?"
Morshidi Sirat, Director, National Higher Education Research Institute (IPPTN) / Dean, Platform for Social Transformation Research, Universiti Sains Malaysia, Malaysia
Ahmad Nurulazam Md Zain, Associate Professor, IPPTN and School of Education, Universiti Sains Malaysia, Malaysia
Munir Shuib, Associate Professor, IPPTN and School of Humanities, Universiti Sains Malaysia, Malaysia
Melissa NG, Lecturer, IPPTN and School of Education, Universiti Sains Malaysia, Malaysia

16:15 - 16:45 **Presentation 8: South Korea**
"Nexuses between Faculty Teaching, Research, and Service"
Jung Cheol Shin, Assistant Professor, Department of Education, Seoul National University, South Korea

16:45 - 17:30 Discussion

18:00 - 20:00 Reception at Hiroshima Garden Palace

Thursday, January 14

8:30 - Registration

*** **Presentations 9-11** ***
Chairs:
Jun Oba, Associate Professor, Research Institute for Higher Education, Hiroshima University, Japan
Gerard Postiglione, Professor & Head, Division of Policy, Administration and Social Sciences, Faculty of Education, The University of Hong Kong, Hong Kong, China

9:00 - 9:30	**Presentation 9: Argentina** "Teach and Research: a study on the current challenges of the Argentine academic profession" Mercedes del Valle Leal, Associate Professor, The National University of Tucuman, Argentina María Adelaida Maidana, Associate Professor, The National University of Tucuman, Argentina
9:30 - 10:00	**Presentation 10: Mexico** "The Divergent Worlds of Teaching and Research among Mexican Faculty: tendencies and implications" Jesus F. Galaz-Fontes, Professor of Education, Autonomous University of Baja California, Mexico Jorge G. Martinez-Stack, Professor, National Autonomous University of, Mexico, Mexico Etty H. Estevez-Nenninger, Professor, University of Sonora Ana L. de la Cruz-Santana, Professor, University of Colima Laura E. Padilla-Gonzalez, Professor, Autonomous University of Aguascalientes, Mexico Manuel Gil-Anton, Professor-Researcher, Autonomous Metropolitan University, Iztapalapa, Mexico Juan J. Sevilla-Garcia, Researcher, Autonomous University of Baja California, Mexico Jose L. Arcos-Vega, Researcher, Autonomous University of Baja California, Mexico
10:00 - 10:30	**Presentation 11: USA** "The Interrelationship of Teaching and Research in the American Academic Context: findings from the Changing Academic Profession Survey, 2007" Martin Finkelstein, Professor, Seton Hall University, USA
10:30 - 11:15	Discussion
11:15 - 11:30	Coffee Break
11:30 - 11:45	**Concluding Remarks** Futao Huang, Professor, Research Institute for Higher Education, Hiroshima University, Japan
11:45 - 12:00	**Closing Speeches** Akira Arimoto, Director & Professor, Research Institute for Higher Education, Hijiyama University, Japan Shinichi Yamamoto, Director & Professor, Research Institute for Higher Education, Hiroshima University, Japan

Appendix 2: List of Participants*

OVERSEAS PARTICIPANTS

Invited Experts

Germany

Ulrich Teichler	Professor & former Director, INCHER-Kassel, University of Kassel

Italy

Michele Rostan	Professor & Director, Center for Study and Research on Higher Education Systems, The University of Pavia

Malaysia

Ahmad Nurulazam Md Zain	Associate Professor, National Higher Education Research Institute (IPPTN) and School of Education, Universiti Sains

Mexico

Jesus F. Galaz-Fontes	Professor of Education, Autonomous University of Baja California

South Africa

Philip Higgs	Research Professor, School for Graduate Studies, The University of South Africa

South Korea

Jung Cheol Shin	Assistant Professor, Department of Education, Seoul National University

USA

William K. Cummings	Professor of International Education, Graduate School of Education and Human Development, The George Washington University
Martin Finkelstein	Professor, College of Education and Human Services, Seton Hall University Seton Hall University

Participants

Mexico

Juan J. Sevilla-Garcia	Researcher, Autonomous University of Baja California
José L. Arcos-Vega	Researcher, Autonomous University of Baja California

USA

Elaine M.Walker	Associate Professor of Education Department of Education Leadership, Management & Policy, Seton Hall University

and another 5 overseas participants

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* As of January, 2010

JAPANESE PARTICIPANTS

Presidents

Toshimasa Asahara	President, Hiroshima University
Susumu Takahashi	President, Hijiyama University

Invited Experts

Akira Arimoto	Director and Professor, Hijiyama University
Takekazu Ehara	Professor, Ritsumeikan University
Yusuke Hasegawa	Assistant Professor Hijiyama University
Naomi Kimoto	Assistant Professor, Prefectural University of Hiroshima

Research Institute for Higher Education (RIHE)

Shinichi Yamamoto	Director and Professor
Ikuo Kitagaki	Professor
Tsukasa Daizen	Professor
Futao Huang	Professor
Naoyuki Ogata	Professor
Jun Oba	Associate Professor
Masataka Murasawa	Associate Professor
Kazunori Shima	Associate Professor
Satoshi Watanabe	Associate Professor
Hideto Fukudome	Associate Professor
Yumiko Hada	Associate Professor
Keith J. Morgan	Visiting Professor

and another 31 Japanese Participants

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