Chapter 7
The Changing Balance of Teaching and Research in the Dutch Binary Higher Education System

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7.1 Introduction

A main feature of Dutch higher education is its binary structure, separating the universities from higher professional institutions (HBO—*Hoger Beroepsonderwijs*) providing a wide range of professional courses with a standard period of study lasting 4 years leading to the bachelor's degree. The sector also provides a limited number of professional master's programs in particular areas such as the health professions, education and engineering. The HBO is internationally termed Universities of Applied Sciences (UAS), a term that will be used in this chapter.

The respective goals and functions of universities and UAS are clearly defined. There are 14 universities, nine of which provide teaching and conduct research in a wide range of academic disciplines. Three universities offer courses mainly in science and engineering, one in agricultural sciences and the Open University. In addition there are a few university level institutions, mainly in theology and business studies. The main objectives of a university education include training for the independent pursuit of scholarship and preparation for those professions that require training at university level. The goals are to be achieved through teaching and research.

Today there are about 40 Universities of Applied Sciences with the main task to provide theoretical and practical training for a wide range of professions with a clear vocational orientation. They also have the important task of transferring and developing knowledge for the benefit of professional development in both the industrial and service (public) sectors. Their role is to support regional needs but

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increasingly are operating nationally and internationally too. About 65 % of the student cohort are enrolled in UAS against 35 % in universities. This nearly 2:1 balance in favour of the UAS is much higher than the OECD averages and much higher than in most other European countries with a binary higher education system.

Although the legal framework encompasses a range of regulations regarding organisational and administrative matters that apply identically to all institutions, the government policy continues to maintain the distinctive profiles of both sectors as a guarantee of institutional differentiation. The main difference is the status of research. For universities, this is a core task. The UAS are traditionally teaching-only institutions but have since the last decade developed a research function—practice-oriented research in the context of the professional preparation and development. The Dutch government supports these institutions in their ambition to develop a research infrastructure and augment the research capacity of these institutions mainly through earmarked funding. This has led to an extension of the working roles of the faculty of these institutions.

This chapter discusses on the basis of the CAP findings how these changes have affected the work roles of faculty regarding teaching and research in both sectors. The argument will be considered whether and to what extent the traditional distinction between research universities and teaching institutions still holds. In the analysis variables of staff on different positions and in different career stages will be taken into account.

The first part provides the policy background in Dutch higher education that puts pressure on teaching and research. Special attention will be given to the changing patterns of system coordination between the state, higher education institutions and the market. Next the way universities have organised their teaching and research will be discussed, followed by the research function at UAS and functional ranking and reward system.

In the second part we use CAP data to investigate what factors affect the working role of faculty members in both universities and UAS and how the teaching and research nexus is being perceived both in undergraduate and graduate programs. Finally the professionalisation of teaching in the binary higher education system will be discussed.

7.2 Research and Teaching in the Dutch System

7.2.1 Historical Traditions

In the international literature the Netherlands are sided with the countries with a strong research tradition. Several Dutch universities enjoy an international reputation and are well represented in global rankings. According to the Times Higher Education World University Ranking (2011), the Netherlands is ‘the standout performer in this year’s tables’ because of the sudden jump of 12 Dutch universities in the top 200 rankings.

However, from a cultural-philosophical viewpoint, the Dutch university system can be seen as a clash between pretentions of unitary and pluralistic tendencies which have their roots in the German, French and Anglo-Saxon tradition (Harskamp 1995; Rupp 1997). The unitary pretentions are based upon the normative principles derived from the Humboldtian conception of a university:

- The theoretical principle of the unity of scientific knowledge
- The pedagogical principle of the unity of teaching, studying and scientific inquiries

From the principle of unity of science, based in the mental attitude of the individual, the unity of research and education arises automatically or more precisely: teaching and learning constitute an integral part of science as 'research' and formal boundaries between teaching and research are blurring. The university in the first place is an institution for disinterested research protected by academic freedom, and the aim of education is scientific formation ('Bildung'). In this conception every student is also an active researcher and the university is a real community in which there is consensus among faculty and students about the fundamental issues at stake. In this conception there is less space for empirical experiments and research that has relevance for practical purposes. Since these activities are a real danger of pluralism, these should organisationally be located outside the university.

This 'Humboldtian' model is a one-sided perspective that is nowadays practically impossible and in its consequences never existed in the Netherlands. Other conceptions can be distinguished that exerted their influence in the history of Dutch universities: the Napoleonic and the economic model (Philipse 2008). According to the Napoleonic model, the university has primarily the task to prepare graduates who are able to perform the cadre for the public functions. Likewise for other professions like physician, lawyer or engineer, the educational preparation was and continues to be primarily a university responsibility rather than an entitlement by some professional body as in some other countries is the case. The economic model is based on the exploitation of knowledge and the view that the university has to be instrumental to demands from the market, such as demands from students and from industry. All these conceptions are manifest in the Dutch system and have left their tracks.

Many critics from academia argue that the emphasis of the university system has shifted away from the Napoleonic and Humboldtian model towards the knowledge-economic model that currently tends to predominate. Another component in the current policy is to encourage institutions to develop their own distinctive profile. This can be a concentration on specific disciplinary or thematic areas, but universities can also make a conscious decision to specialise in outstanding teaching and scholarship rather than in research, quite the opposite of the Humboldtian idea of the university.

In 'Adieu von Humboldt?' Francot and De Vries (2010) describe how the Humboldtian model has been challenged by market forces and economic rationality. This economic rationality imposes organising principles on the university as a corporate organisation thereby changing the triangle of coordination between the state, institution and market forces.

7.2.2 Changing Patterns of System Coordination

Traditionally the state has played a significant role in higher education and research, particularly regarding the finance and administration of institutions, prescriptive educational structures and course requirements. During the last 25 years, the traditional governing arrangements have been criticised and alternative roles developed. In the 1980s and 1990s, the shifting governance style on the higher education and research sector was expressed in terms like 'steering at a distance', 'new public management', 'communicative planning' and 'network governance', to mention a few.

Some of these 'models' are connected with a general political view on the changing role of government towards the public or semipublic sector in general. Similar role models of ministerial governance can be found in fields like health care, hospitals, housing corporations and public transportation, all fields which have been infused with private sector elements. There are doubts whether the private elements—with emphasis on market mechanisms, clients' roles and consumer choices—would do justice to the specific character of the public domain where clients have insufficient information and have no competency to judge adequately the services provided.

Also the growing emphasis which became apparent in the Anglo-Saxon world on the economic exploitation of knowledge and market-driven reform strategies to generate external revenues found a breeding ground in the Netherlands. The Act on the Modernization of the university governance structure (1997) stimulated a further 'Americanisation' of Dutch higher education. This shift away from the continental model where authority is vested in academic oligarchy as well as state bureaucracy was apparently more supported by the ministry and university managers than by the (often resisting) academic research community.

An important turning point with the role of the Ministry as the central planning and regulative agent of education and research took place in the 1980s with two papers:

- The White paper on University Research (1979): coordination of research on the basis of national research programs as determined by external, disciplinary-based committees. Science should serve national (economic) interests more directly. This was regarded as the first market-type form of coordination as universities had to compete for research grants on the basis of research quality assessments.
- 'Steering at a distance'. The autonomy of institutions should be increased so that they can be more responsive to their environment. The autonomy implies that detailed input control has been replaced by output measures in terms of high-quality education and research.

The views expressed in both papers constituted the basis for subsequent higher education policy-making and continue to be actual till the present day. The ministry should not steer higher education with detailed planning and extensive control mechanisms, but should adopt a facilitative role allowing institutions considerable freedom in managing their own affairs.

At the same time funding mechanisms have increasingly been based on output performances such as student progress and graduation rates, societal relevance of research and commercialisation and valorisation of research. This way of steering the system, known as New Public Management (NPM), relies on (1) markets rather than planning, (2) strong performance measurement and audit mechanisms and (3) entrepreneurial management (Ferlie, Musselin and Andresani 2009). The university governance structure tends to transform the traditional task-oriented organisation in which academics have a large amount of professional autonomy into a market-type organisation which stresses the managerial aspects of teaching and research. The basic notion of NPM involves the steering by incentives and increasing competition in the university (research system) system. This is manifest in, for example:

- Increasing dependency of research on separately budgeted funds.
- Increased dependence on the competitive strength of the departmental unit or research centre. Resources are allocated according to internal policies by rectors, deans but also by the Dutch Research Council and external constituencies (public and private organisations alike).
- Emphasis on a corporate style of leadership and management.

The NPM led to a new configuration of authority relations. For criticasters NPM has resulted in a form of managerialism that 'domesticizes the genuine professional and disciplining professionals to submissive knowledge workers' (Lorenz 2008). The prevailing profession-coordinating model has been replaced by a model in which the state, institutional management and the market are stronger intertwined than ever before.

First, the new university governance structure resulted in considerably stronger management on the central institutional level and its constituent faculties. Professional managers with increased budgetary responsibilities and authority for staffing issues have replaced the collegial structure that previously typified the university decision-making structure.

Second, the state exercises its powers in relation to institutions' outputs and the societal consequences of the universities performances ('output steering'), thereby reducing institutional autonomy. The current government emphasises accountability about results achieved through the mechanism of performance agreements between institutions and the government (Ministry of OC&W 2011). These agreements include measurable outcomes regarding the educational process in particular on study progress and success rates and profiling of research and education as well as valorisation of scientific research. A larger part of the budget is depending on the meddling of the government which through a list of performance indicators gets a grip on a complex system of agreements focusing on relevant outcomes.

Third, the market coordination enters where universities should become 'real' corporate organisations. The effect was that some universities increased their commercial activities and the 'entrepreneurial university' was born with the basic feature to increase private funding, thereby making them less dependent on government funding.

These three authority components in their mutual interdependency constitute the centre of the coordination although it seems that the overall direction of higher education and research is more under control of the state. The question arises whether this change has implications for the balance between teaching and research.

7.3 Shifting Balance Between Research and Education

7.3.1 Teaching and Research in Universities

The NPM steering model emphasises the performance of the system as a whole and the power that this entails is generally believed to be too strong. The CAP survey reveals on three items how the NPM has been experienced by academics:

- The larger majority of the Dutch professoriate (58 %) agrees or strongly agrees with the statement that their institution uses performance-based allocation of resources to academic units. Their international colleagues show much lower levels of agreement, with the exception of Finland (60 % agreeing).
- Likewise, Dutch respondents are the second highest to agree that the funding of departments is substantially based on numbers of graduates: 60 % agreeing again after Finland (with 72 %).
- Eighty-six percent of the Dutch respondents agree or strongly agree with the statement that 'the pressure to raise external research funds has increased since my first appointment'. This is by far the highest percentage of all advanced CAP countries.

Regarding teaching the performance is increasingly depending on study progress of students and graduation rates. It is therefore in the interest of institutions to direct their students as efficiently as possible through the curriculum. Additional time investment for students who are behind is a financial burden. This steering by incentives has its perverse effects in terms of quality, and institutions feel forced to organise their curricula in such a way that students are enabled to finish in time. Another implication is that those courses that are not cost-effective and do not constitute part of the core curriculum will be cancelled. In some fields this has resulted in a reduction of the number of courses especially at the bachelor's level leading to the development of broader courses at this level, a development supported by the present government. This development entails a further differentiation between education and research as researchers in a particular domain no longer have an 'own' optional course within the curriculum (Francot and De Vries 2010).

Research funding for universities depends on three streams: core funding for universities, funding through the research council and contract research. Over time research funds have gradually been transferred from the core funding towards the funding by the research council, one argument being that such a reallocation would facilitate to steer research more on the basis of research performance, productivity and

social-economic relevance. Especially the latter criterion has been strengthened, and researchers are required to indicate in their proposal what the relevance of their research outcomes will be in terms of marketable application (valorisation). This is quite a tentative endeavour, often leading to conservative research approaches stifling more innovative or more risky but challenging research.

Contract research with business is the third stream and individual researchers are increasingly dependent on these financial sources. Some research groups are required to earn up to 50 % of their research budget externally. In other words, universities are not merely the place where independent research is undertaken, it also is increasingly dependent on market forces.

One of the key policy issues is to increase incentives in order to foster a more dynamic research landscape and more profiling of research and to fund specific areas. Especially the government innovation policy regarding R&D enforces universities to engage with business in selected top sectors. By providing fiscal facilities, companies are incited to invest more in R&D than is currently the case. The argument being used is that the national budget for R&D is among the lowest in the European Union. The average budget as percentage of the Gross Domestic Product (GDP) decreased to 1.67 % (in 2010) which is under the European Union average of 1.84 %. Whereas the investment in R&D in the last decade showed no growth at all, other EU countries spent additionally an average of 15 %. The other side of the picture is that such an enforced cooperation between universities and business entails that university research is increasingly subject to a norm of relevance and problem definition that is at odds with basic science and academic independence.

In the light of these developments, universities have organised their teaching and research in different organisational units, with separate budgeting and resources and with separate managerial structures for the respective teaching and research program as well as their staffing. Although these can be rather virtual units, the question arises to what extent such an organisational divide would affect the teaching and research work load and whether this would open a widening gulf between the two core roles of the academic profession.

7.3.2 Research at UAS

Traditionally the UAS are seen as ‘teaching-only’ institutions, which have been assigned a special role by preparing students for a variety of professional areas. In the last decade research has been playing an increasingly important role alongside their teaching obligations. Many UAS see it as their mission to accommodate societal demands by linking professional practice and education through innovative practically oriented research. This evolving research function of UAS has been supported by government with targeted funds to build a research infrastructure and to attract qualified researchers by creating the new rank of lector as a kind of professorship who has been assigned a leading role in a research group.

Research at UAS has some common features (De Weert and Leijnse 2010):

- Initiatives for research emanate from the needs of professional practice.
- Research should be relevant for the quality and innovation of education and the professionalisation of the teaching faculty.
- Research should be practice driven in that it is oriented to solve practical problems and to intensify collaboration with industry.

Two basic principles are underlying the conception of research at UAS. First, research should be closely interwoven with and beneficial to the teaching of students through for example inquiry-based learning. In a knowledge economy students are expected to acquire competencies that can be termed 'research skills' such as problem definition, methods, inferring conclusions and interpretations. Professional education in combination with applied research will allow these competencies to develop (Borgdorff et al. 2007). Some institutions have organised their research activities in separate units similar to the university but generally have integrated research with educational sections.

The second principle is that research is strongly demand led with financial resources from business and the government through targeted funds. These financial arrangements should provoke an articulation of research demands from the relevant professional field.

7.3.3 Functional Differentiation and Reward Systems

The standard model for academics to allocate a fixed percentage of time for teaching research and administration (respectively, 40–40–20 %) has been replaced by a staffing model that allows greater possibilities for a differentiated work role regarding teaching and research. The basic idea is that teaching and research are equally important and that these tasks may exist in different proportions in the workload of individual faculty members. Allowing flexibility would recognise the full range of facets of academic work to be expected from researchers and teachers as well as the different aspirations and competencies of faculty.

The new system of job ranking effective since 2002 aims to make explicit the various roles, tasks and responsibilities that have to be carried out to achieve specific results. Individual staff members can apply for specific roles on the basis of the actual appraisal of individual performances and on future development plans, for example, to be more involved in either teaching or research. Teaching activities are classified in four specified tasks such as teaching, curricular development, participating in project groups and curriculum evaluation. Research activities consist of co-ordination, acquisition of contract research and participating in research working groups and scientific or advisory committees. Within each of the main ranks, functional categories are distinguished with research and education. For example, professors are classified in three functional categories. In the extent to which a professor

is more authoritative in the field, more managerial and leading larger research group, the higher the status and appraisal scheme. The UAS adopted a similar system of functional differentiation.

The system has been criticised because of its bias towards the position of management activities in the staff hierarchy and the creation of a stronger pyramidal or hierarchical structure with new forms of superimposition (Lorenz 2008). Yet the system cannot be conceived as a further step in the disentanglement of the teaching—research nexus creating teaching-only and research-only staff. Rather, through a system of functional differentiation, specific competencies can become manifest whereby the research performance is not the all-determining criterion for promotion and tenure. Exclusive concentration on either teaching or research is possible but only for the duration of a previously arranged period. The combination of competencies in teaching and research is assessed higher than competencies in either teaching or research.

Thus, although there is a flexible ranking order of functions (an academic can reach a higher rank on the basis of teaching qualifications), the model reinforces the combination of teaching and research qualifications, giving equal value to excellence in teaching and in research and more generally in academic scholarship. In other words, high-level achievements in research do no longer serve as a sufficient criterion for academic excellence.

The three developments described above mark the academic profession in Dutch higher education. On the basis of CAP, data aspects of the work role regarding teaching and research will be analysed as well as the interrelationships between them.

7.4 Conditions of the Academic Work Role

In the analysis of CAP data, the different ranks at universities and UAS have been arranged as follows. For universities three main positions can be distinguished: Professor, University Main Lecturer (UHD) and Lecturer (UD). These positions correspond roughly to the international terms full professor, associate and assistant professor. The proportional distribution of the total population of academic staff (12,430 in 2010) is 19 %, 17 % and 36 %, respectively. The other 28 % consists of other academic staff, mainly postdocs and research associates. In the analyses the professors and associate professors have been taken together as the ‘higher ranks’ and the other positions as the ‘lower ranks’. The sample distribution shows a very similar distribution, respectively, 19 %, 16 %, 38 % and 27 % which is a representative sample for position (chi-square = 6.98, df = 3, $p = 0.07$).

The positions at the UAS can be quite differentiated and institutions often use their own categories. The ‘higher ranks’ consist of lector and senior lecturer/researcher. They have an explicit task to carry out research and consultancy activities for external constituencies. The ‘lower ranks’ consist of college teacher, lecturer and

Table 7.1 Descriptive statistics of the academic work role, controlled by institutional type and by rank

	Universities 1992			Universities 2009			Other HEIs 2009		
Rank	Total	High	Low	Total	High	Low	Total	High	Low
(*N*)	(649)	(309)	(340)	(628)	(292)	(336)	(539)	(175)	(364)
Teaching hours weekly	44 %	38 %	49 %	45 %	40 %	50 %	61 %	47 %	69 %
Research hours weekly	26 %	25 %	26 %	32 %	33 %	32 %	14 %	25 %	9 %
Total hours weekly	54 %	56 %	53 %	43 %	45 %	42 %	35 %	37 %	34 %
Research oriented	76 %	78 %	74 %	78 %	78 %	79 %	35 %[a]	51 %	17 %
Journal articles	3.1	4.1	2.3	9.5	11.2	7.8	1.3	1.4	1.1

[a]The Carnegie 1992 study showed that of the total staff in UAS 18 % was research oriented and 82 % teaching oriented

instructor at various levels. The proportional distribution of the total academic staff (16,152 in 2010) is for lector 3 %, senior lecturer/researcher 46 % and the lower ranks 51 %. The sample distribution is, respectively, 2.2 %, 30.3 % and 67.5 %, showing a slight overrepresentation of the lower ranks (chi-square = 59.06, df = 2, $p < .001$). This is not problematic since these ranks will be itemised in the analyses.

Table 7.1 presents descriptive results of the two surveys of the staff working role: weekly hours in teaching and in research as proportion of the total weekly hours, teaching versus research orientation and publication of journal articles. These data are controlled by institutional type and academic ranks.

Comparing data from the 1992 Carnegie study with the 2009 CAP survey, university respondents in 1992 reported over 50 weekly work hours, most of which were attributable to teaching hours and much less hours devoted to research. A rather substantive part has been devoted to other tasks not directly related to teaching or research. It is not clear how the total working hours could fall in 2009 to 43 h per week. The total proportion of time spent on teaching and research has increased, possibly due to the fact that over the years professionals in the organisation have taken over administrative tasks that were previously done by academics. Staff could devote more time to their core academic tasks.

The weekly hours in teaching as proportion of the total weekly hours has remained quite stable over the years (although in absolute hours has declined), whereas the proportional time spent on research increased from 26 % to 34 %.

The time spent on research differs to rank. For both the higher and lower ranks, teaching comprises the main part, the lower ranks slightly more in hours and relative to the total working hours. The higher ranks (among them the full professors) spent more time to management than the others. These figures illustrate how the previous ideal on average proportion of 40–40–20 turns out in favour of more teaching time in universities, 43 % and 33 % on average. Another observation is that while lower rank university respondent devoted in 1992 more time to teaching than those in the higher ranks, this difference has decreased only slightly. These CAP data of time spent on research/teaching are remarkably consistent with the finding in an earlier survey in the Netherlands to determine the time spending by university academic personnel (De Kok et al. 2007).

Table 7.2 Teaching and research by gender and employment contract

	Gender				Employment contract			
	University		UAS		University		UAS	
Gender	M	F	M	F	Tenure	Non-T	Tenure	Non-T
Total *N*	314	158	165	325	347	124	370	76
Teaching hours weekly	43 %	48 %	61 %	59 %	45 %	40 %	59 %	87 %
Research hours weekly	33 %	31 %	15 %	15 %	29 %	46 %	15 %	11 %
Total hours weekly	43.6	42.3	38.7	32	44	40.1	35.5	31.5
Research oriented	78 %	77 %	33 %	27 %	73 %	87 %	29 %	25 %
Journal articles	10.5	7.4	1,3	1.4	10.8	7.1	1.2	2.1

The research orientation, measured as the percentage of the own preferences primarily in research and leaning to research (compared to teaching or leaning towards teaching), has remained quite consistent for university faculty over the years. There is a slight increase of the lower rank respondents indicating that their interests lie primarily in research or leaning towards research.

The figures for the other HE institutions, the UAS, reflect the emerging research function in this sector. The difference in weekly research hours between the higher and lower ranks is explainable since the two higher ranks have the explicit task to do research, whereas the lower ranks are mainly charged with teaching tasks. The latter, however, are enabled to engage in research, as part of a research team or on an individual basis. For the total staff group, the research orientation of the total staff has doubled from 18 % (in 1992) to 35 %, while more than half of the higher ranks have research preference/leaning to research. This finding means that the institutional differences are attenuating.

A difference between universities and UAS is the total weekly hours spent, for universities this is much higher than for their UAS counterparts. This is possibly due to the higher number of part-timers in UAS. In the university sector 72 % is full-time employed, whereas in the UAS this is 48 %. Given this major difference, the part-time factor will be included in the further analysis.

Finally the productivity in terms of publication of journal articles (only respondents with any research output) has increased considerably between 1992 and 2009, whereas the actual hours invested in research have remained rather unchanged. This shows the high productivity of Dutch academics and also the increasing importance attributed to scholarly articles.

Other variables are expected to affect the working role as well in particular gender and employment situation. These are summarised in Table 7.2 and again controlled by institutional type.

As in other countries, women tend to be less oriented towards research than men and spend less hours for research relative the total weekly working hours. For universities, however, the difference is negligible on all dimensions, but for UAS the differences are larger on all aspects including the fact that women spend less time to teaching. Presumably the part-time factor may play a role here.

Regarding the employment contract, the differences are more pronounced. Tenured university faculty members do more teaching, whereas nontenured faculty do considerably more research. The latter also expressed their preference for research or leaning to research. This corresponds with the general fact that in the Netherlands, temporary contracts mainly apply to those who have primarily research positions and much less in charge of teaching. This is quite the reverse of what is common in for example North American universities where nontenured staff are predominantly in teaching jobs (Finkelstein et al. 2009).

In the UAS on the other hand, 87 % of the total weekly hours of nontenured faculty are absorbed with teaching and their research time is correspondingly low. General conclusions are difficult to make since the proportion of nontenured positions in the UAS sector is quite low: 15 % against 33 % in universities. This is by far the lowest of all CAP countries for the 'Other HE Institutions', only the UK is nearing with 18 %.

7.5 Regression Results

The descriptive variables were used in a regression analysis for the research time, preference for research and publications as follows:

Relative research time: the hours spent per week time on research (including reading literature, writing, conducting experiments, fieldwork) divided by the sum of the teaching time and research time. This is a measure of the relative time spent on research compared to teaching.

Preference for research: the score of the interests primarily in research or leaning towards research (the other two categories with focus on teaching add up to 100 %).

Publications: the sum of publications of books, articles published in an academic book or journal, research monograph written for an externally funded project and papers for a scholarly conference. This measure of publications is only of those respondents with *any* research output. A correction of extreme cases has been carried out. It was considered to differentiate between different types of publications such as refereed international journal articles, book chapters, review of books and textbooks. Other research (Horta et al. 2012; Shin 2011) separate international journal articles from publications in domestic journals or textbooks in their effect on teaching indicators. Shin (2011), for example, assumes that research by book publication might be closely related to teaching performance because especially textbooks cover comprehensive knowledge, which is essential in discipline-knowledge-focused teaching. As the CAP survey does not allow a sharp distinction between international publications and domestic journals or textbooks, it was decided to combine the major types as an indicator of research output.

As independent variables we used dichotomised categories: discipline (STEM subjects), employment status (permanent employment or tenure), academic rank (higher ranks), appointment (part-time), gender (female) and age. It is expected that

Table 7.3 Regression analysis for research time, focus of interests and publications, controlled by institutional types

	Relative research time		Preference for research		Publications	
	Universities	UAS	Universities	UAS	Universities	UAS
Variables	*Beta*	*Beta*	*Beta*	*Beta*	*Beta*	*Beta*
Discipline (STEM subjects)	0.149**	–0.035	0.074	–0.049	0.048	–0.004
Employment (tenure)	–0.275**	0.090	–0.170**	0.018	0.086	–0.044
Rank (high)	0.174**	0.475**	0.062	0.392**	0.140**	0.228*
Appointment (part-time)	–0.113*	0.047	–0.140**	0.051	–0.220**	–0.005
Gender (female)	–0.038	–0.007	0.025	–0.068	–0.050	–0.077
Age	–0.048	0.019	–0.139**	–0.084	–0.026	–0.124
N	385	286	464	314	450	119
R2 (adjusted)	0.11	0.22	0.08	0.14	0.09	0.01

**Significant $p = <.01$; *$p = <.05$

the relationships differ according to these characteristics. The discipline is added in the analysis since in the literature differences between disciplinary areas are strongly predictive of how faculty members spend their time on teaching and research (Fairweather 2009). Earlier research in the Netherlands on time spent on research/teaching revealed that the different disciplines show a similar pattern except for the natural sciences and engineering (STEM fields) where the faculty spent twice as much time on research than in the other disciplines (De Kok et al. 2007). For this reason we included the STEM sciences versus the rest of the disciplines as a dummy variable in the analysis.

We intended to include the institutional variable (university and UAS) in the analysis. However, this variable is more strongly predictive of how faculty members score on the research variables as expressed by the relatively high explained variance (34 %). This variable is so determining that the effect of the other variables would be very difficult to interpret. Given the assumption that the effects of the different variables are not similar, for example, rank may differ between universities and UAS, the analysis has been split up for the two types of institutions separately to test the effects of the six independent variables.

Table 7.3 presents the results of the regression of the work role on the six predictors for universities and UAS separately. The variables were added subsequently, testing the effects of each of them on the research role thereby excluding interaction effects. To give information about the relative importance of the independent variables, the standardised regression coefficients are reported.

The multiple regression analysis determines the effect of a variable in combination with the effect of the other variables. Overall the academic rank appears the most important predictor. This means that the higher the rank, faculty members are spending more time on research than on teaching, have a larger output and are stronger oriented towards research. For UAS the rank is the only variable that makes a difference. The higher the rank (lector and main lecturer/researcher), the more

faculty spend time on research is more orientated to research and shows a higher publication output than those in the lower ranks. This confirms the division between the higher ranks who are assigned explicitly a research task and the lower ranks where teaching is emphasised and research is optional.

For universities the discipline (STEM subjects) has also a positive effect on research time of university faculty. This may be attributed to the relatively high number of doctoral students and other scientific staff that need a research-intensive environment.

Another powerful predictor for university faculty is the employment contract in the sense that those on tenured positions spend more time on teaching and express a more equal orientation on teaching and research than those on temporary contracts. The latter are more oriented to research, presumably given the fact they are mostly employed on temporary research contracts.

Part-time is negatively associated with research. Gender does not appear to have determinative power on any of the dependent variables. Although on most aspects women score negative, the differences are not significant. Finally, age is reversely related to the preference for research. Thus, the younger the staff (and more contract relationships), the higher they score on the research working role, whereas the older the staff member the less research oriented.

Through additional analysis we researched to what extent the coefficients differ between the two institutional types. It appears that for discipline, type of appointment, employment and rank also differ significantly differ from each other. For example, the university higher ranks spend more time on research; this relationship is more extreme at UAS.

The conclusion from our analysis so far is that the organisational changes in Dutch higher education and the functional differentiation have not led to a major shifting balance of teaching and research. Teaching remains the larger component of the work role. However, research has compared to teaching increased in importance. This applies in particular for those in the higher professorial ranks who are in the exact sciences/engineering and are full-time employed. This goes along with increased research productivity. Institutional differences continue to be important in defining the work role regarding teaching and research. However, the differences are attenuating as the research role of the UAS is increasing, particularly regarding the higher ranks.

The relative time spent on teaching and research and research preference do not say very much about the compatibility of both work roles and the possible synergies between them. This will be discussed in the next section.

7.6 Perceptions on the Teaching and Research Nexus

Although teaching and research are the core tasks of academics, there is less conformity about the question whether teaching can exclusively be done by those who also do research or whether these tasks can be separated and assigned to different faculty

without a loss of quality. Given the scarcity of working time and energy, faculty members have to choose between teaching and research activities. They often tend to limit their teaching load in favour of their career perspectives according to the 'differential rewards model' that is prevailing in most systems (Hattie and Marsh 1996). Apart from this research and teaching may require different qualities which may justify a further differentiation of work roles. There is, however, no best way of relating research and teaching as there are various ways in which this nexus can be achieved (De Weert 2009; Jenkins et al. 2007; Visser-Wijdveen et al. 2010).

Research on the connection between teaching and research attempts to find statistical correlations between teaching effectiveness as measured by student evaluations and research productivity as measured by publication counts. In their classical research Hattie and Harsh (1996) found that there is a near-zero relationship between quality of teaching and research at the individual and at the departmental level, suggesting that research and teaching are at best only loosely coupled. Time spent on teaching is not related to teaching effectiveness and slightly negatively related to research productivity. Gottlieb and Keith (1997) who used the 1992 Carnegie survey, however, found a positive relationship between the mean weekly hours spent on teaching with respect to research, suggesting the complementary character of the two activities up to a certain threshold level of diminishing returns where research efforts operate to reduce the quality of teaching.

It can be assumed that the synergy between education and research increases with the level of education. It really matters whether teaching involves basic knowledge in a classroom setting or learning in small groups of students who already master the basics. Particularly at the bachelor's level, student groups are larger, courses are mandatory and the curriculum content is more standardised focusing on a broad range of disciplinary knowledge. Teaching predominantly graduate students, however, is more related to working in a research environment and requires corresponding skills and what Hattie and Marsh (1996) call 'similar personal characteristics' for teaching and research: writing papers and presenting and discussing from a research perspective. In such a situation both qualities of the researcher and teacher are united. If this holds, a negative relationship between research and teaching can be assumed in the first phase of the curriculum, while a positive relationship is more applicable on the advanced level. Neglecting the distinction between undergraduate and graduate education would disturb the relationship between research performance and educational effectiveness. Research might be highly associated with teaching at the graduate level rather than at the undergraduate level. This view is supported by empirical evidence which shows a negative association between international journal publication and teaching quality at the undergraduate level (Shin 2011).

The role of the educational phase on the link between research and education was the focus of a research project at the Faculty of Economics of Erasmus University Rotterdam (Arnold 2007). Comparing data on student evaluations (to measure teaching effectiveness) and research performance (being a member of a Dutch national research school and number of publications), the models show an inversion in the relationship between educational effectiveness and research

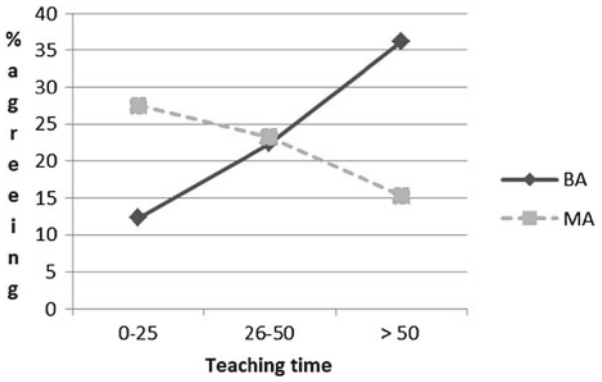

Fig. 7.1 Percentage of respondents agreeing with the statement on the incompatibility of research and teaching by teaching time in BA and MA programs (university respondents, $N=452$)

performances in the later phases of the educational process. While the relationship is negative in the first 2 years, it is significantly positive in the later years. The data indicate that there are excellent teachers who do not belong to a research school and excelling researchers who have a low score on student evaluations. The results can be interpreted in the sense that the relationships between teaching and research skills and time spending are working in the opposite direction and the educational phase affects the strength of the relationship.

Although the CAP survey does not measure educational quality as such, it includes two explicit items on the teaching/research nexus, one negatively formulated and the other positively.

- 'Teaching and research are hardly compatible with each other'.
- 'Your research activities reinforce your teaching'.

For both items the percentages of 1 + 2 agreeing are combined with the proportion of teaching time at the bachelor's respectively in master's programs. This has been divided in three rather equally distributed categories (0–25, 26–50 and over 50 % of total teaching time). Only those respondents are included that indicated to be involved in research.

Figure 7.1 shows how the view that 'teaching and research are hardly compatible' increases in the extent to which the teaching proportion in bachelor's programs increases. For master's programs the reverse is the case where disagreement (with this proposition) goes together with a higher proportion of teaching in master's programmes. Figure 7.2 shows a very identical pattern in the sense of supporting the thesis that the link between teaching and research is stronger when the proportion of teaching in master's programmes is larger.

These findings suggest that teaching one's specialty in some research domain and teaching in undergraduate programs is far away from the principle of the Humboldtian unity of teaching and research. The added value of productive researchers in these programs is the lowest. In this context Clark speaks about the 'increasing gap between frontier knowledge and teachable codified knowledge' (Clark 1995). A more positive link between teaching and research appears

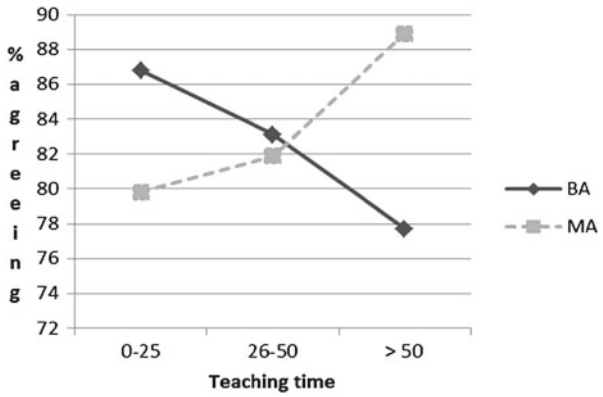

Fig. 7.2 Percentage of respondents agreeing with the statement that research reinforces teaching by teaching time in BA and MA programs (university respondents, $N=431$)

Table 7.4 Views of Dutch UAS faculty on the link between applied research and education (percent 1 and 2 (strongly) agreeing on a five-point scale), by rank

Rank	High ranks	Low ranks
(*N*)	(121)	(221)
Research contributes to the professionalisation of the teaching staff	90	70
Research contributes to curricular innovation	82	74
Research contributes to innovation of professional practice	80	77
Students who are actively involved in research are better prepared for future professional practice	78	51

especially to play a role at the master's level in which productive researchers have a significantly higher score in student evaluations, whereas the added value of productive researchers at the bachelor's level is the lowest (Arnold 2007). This may vary for different subject areas. In disciplines with a hierarchical knowledge structure like in the exact sciences, staff research may be so far ahead of the undergraduate curriculum that a strong connection between the research by faculty and student learning is very difficult to achieve and can only be activated at the graduate level (see for a similar point also Jenkins et al. 2007; Robertson 2007).

The view presented here challenges the policy question to what extent a differentiation in working roles would be desirable, for example, by deploying faculty members who perform high on either research or teaching. General guidelines are difficult to make as this may vary considerably between disciplinary fields, types of institutions and stages of learning. This is also dependent on the kind of connection between teaching and research and how research has to be understood.

In this context the situation of the UAS is illustrative. The Dutch CAP questionnaire included an extra set of propositions especially for UAS faculty members about the link between applied and practice-oriented research and education (Table 7.4).

There is much agreement about the positive link between research and its contribution to teaching and the usefulness of research for students in their later professional life. The higher ranks again are more positive about the significance of research

for the teaching process, but also the lower ranks are predominantly positive. This may allude to their growing involvement in research. Research is conceived here in a rather broad sense, including providing students with systematic research methods and the design of the curriculum around inquiry-based activities and project work. This is quite different from students participating in research projects (mostly on advanced levels) oriented to the development of a deductive research process.

7.7 Professionalisation of Teaching in the Binary System

The positive links between research and teaching as perceived by UAS faculty members question the sharp distinction being made between the research universities and teaching institutions in binary systems. As such the applied research undertaken by UAS can be delineated from university research (De Weert 2011). Boyer's plea for a reconsideration of scholarship is particularly relevant here where the core values and activities of the academic profession are more connected to the practical service than to the academic prestige market. That model emphasises not only teaching but also the application of scholarship in local contexts. Research in the context of application and its relevance for professional practice is a profiling strength of the UAS sector, and reinforcing this type of research is seen as a quality boost to education and curricular innovations. For faculty members this research is increasingly becoming an integral part of their working time.

Regarding universities a stronger functional differentiation between teaching and research does not find much support among faculty members. Dutch university faculty strongly disagree with the statement that 'research funding should be concentrated on the most productive researchers'. Only 25 % do agree with this statement which is the lowest of all CAP countries, with the exception of their colleagues from Canada who have a slightly lower score (23 %).

A sharp distinction between research and teaching institutions would also suggest that for the research institutions teaching is less relevant. On the contrary, Dutch universities have as a response to external pressure turned up the heat on teaching quality. As indicated before, this relates to the current NPM emphasis on efficiency and output with the perverse effects of pushing as many students efficiently through their studies. But it also alludes to the current importance attached by universities to the teaching quality and the acknowledgement that teaching competence requires a qualification in itself.

If we compare CAP data on aspects of teaching quality between universities and UAS, the following picture emerges:

- Regarding the facilities and resources to support the work, the differences between university respondents and UAS are remarkable. University respondents evaluate virtually all facilities higher than the UAS respondents. Apart from specific research-related activities which expectedly are in favour of universities, the teaching-related facilities are at universities higher evaluated than at UAS. This regards classroom, technology for teaching, secretarial support and teaching support staff.

- On the item whether there is 'encouragement to improve their instructional skills in response to teaching qualifications', 49 % of university faculty agreed or strongly agree against 51 % of the UAS faculty.
- On the item whether 'at the institution there are adequate training courses for enhancing teaching quality', almost 60 % of the university faculty agreed or strongly agreed, while the UAS faculty is lagging behind with 47 %.
- On the question 'to what extent the institution is considering the teaching quality when making personnel decisions', 33 % of the university faculty agreed or strongly agreed against the UAS faculty with 44 %.

These findings are indicative of the importance of teaching at universities compared to UAS. Many universities nowadays require from their new faculty to obtain a teaching qualification before they are allowed to practice, and faculty are during their career encouraged to update their teaching skills. The time when it was assumed that a good researcher is automatically a good teacher in the Humboldtian sense is far behind us. If these Dutch figures are compared with those from countries with a similar binary structure (Germany, Finland, Portugal and Norway), it is interesting to observe that the Dutch university faculty has the highest agreement score on all these items of teaching quality. In all the other countries, the university faculty members show lower levels of agreement.

For the Dutch UAS compared to their counterparts abroad, this is also the case except for Germany where the UAS faculty agrees more with the statement that teaching quality is considered for personnel decisions. Likewise, Dutch faculty of UAS are compared to their counterparts in the 'Other HE institutions' in the advanced countries more positive about teaching support staff (35 %) and research support staff (23 %). Only Finland shows slightly a higher score on both items.

7.8 Conclusions

The results confirm that in Dutch, higher education teaching and research continue to be the core working roles of academics. The time spent on research and teaching is in balance whereby all ranks devote slightly more time to teaching than to research. Only the nontenured positions are predominantly assigned a research task. Teaching is not left to teaching-only positions like this is the case in some other countries, but continue to be an important part of the role of tenured faculty in all ranks. Functional differentiation in the sense that a faculty member is allowed to concentrate working time on research or teaching is possible, but only for an agreed period. Most Dutch academics agree that a fair balance between teaching and research should be maintained.

The results suggest that the institutional type remains an important influence on how faculty spend their time. For university faculty research is an essential part of the work load, and the time spent on research has proportionally increased since the 1992 Carnegie survey, whereas for the UAS sector teaching still is the predominant activity. The differences between the institutional types, however, tend to become attenuated for two reasons. One is that teaching in universities increasingly requires

specific qualifications as well as professional development on a continuous basis. The appraisal scheme in the university job ranking system assures that teaching capabilities will be rewarded and that it is difficult to progress in ranks only on the basis of research productivity.

The other major reason is that the UASs, although originally being teaching institutions, have developed their research function mainly in practice-oriented research and that this research should benefit students for their professional preparation. Time spent on research has increased in this sector, particularly for the higher ranks who are explicitly charged with research tasks. For the lower ranks research has a lower priority, but it is expected that their role in research will increase. There is a push coming from inside and outside the UAS sector to increase the research qualifications of faculty members, for example, by raising the number of doctorates among the staff or attracting more staff with research experience from professional practice.

What would this mean for the future of the binary system? The major distinction between research universities and the UAS as teaching institutions looses some of its legitimacy. It will be unlikely that institutions that want to specialise in outstanding teaching and scholarship and others specialising in research—if this would result from the current discussion on institutional profiling—will occur along the binary divide only. Other differentiations are as likely on either side of the binary line.

A policy towards separation of research and teaching tasks has to be considered in a differentiated way. The focus should be on identifying what levels of research and teaching are optimal to enhance the complementarity between them. If the added value of productive researchers at the bachelor's level is low and can only be activated at the graduate level, would this mean that they spend more time on research and teach in graduate programs only? Deploying faculty members who perform one-sided high on either teaching or research at the bachelor's level would be an attractive policy option given the time constraints of productive researchers who are less inclined to invest time in preparing the undergraduate classes. This view has been fuelled by the current trend in Dutch universities to introduce general programs that are increasingly replacing disciplinary programs at the bachelor's level, postponing the specialisation to the graduate level. Adequate measures for teaching quality and various forms of research-based learning are pivotal to explore this issue further.

References

Arnold, I. J. M. (2007). De rol van opleidingsfase voor het verband tussen onderzoeksprestaties en onderwijseffectiviteit. *Tijdschrift voor Hoger Onderwijs, 25*(4), 256–269.

Borgdorff, H., van Staa, A., & van der Vos, J. (2007). Kennis in context. Onderzoek aan hogescholen. *TH&MA, 5*, 10–17.

Clark, B. R. (1995). *Places of inquiry. Research and advanced education in modern universities*. Berkeley: University of California Press.

de Weert, E. (2009). The organized contradictions of teaching and research: Reshaping the academic profession. In J. Enders & E. de Weert (Eds.), *The changing face of academic life, analytical and comparative perspectives* (pp. 134–155). London: Macmillan.

de Weert, E. (2011). Transformation or systems convergence? The research profile of universities of applied sciences in Europe. In J. Enders, H. B. de Boer, & D. F. Westerheijden (Eds.), *Reform of higher education in Europe* (pp. 103–123). Rotterdam: Sense.

de Weert, E., & Leijnse, F. (2010). Practice-oriented research: The extended functions of Dutch universities of applied sciences. In S. Kyvik & B. Lepori (Eds.), *The research mission of higher education institutions outside the university sector* (pp. 199–219). Dordrecht: Springer.

Fairweather, J. (2009). Work allocation and rewards in shaping academic work. In J. Enders & E. de Weert (Eds.), *The changing face of academic life, analytical and comparative perspectives* (pp. 171–194). London: Macmillan.

Ferlie, E., Musselin, C., & Andresani, G. (2009). The governance of higher education systems: A public management perspective. In C. Paradeise et al. (Eds.), *University governance – Western European comparative perspectives* (pp. 1–21). Dordrecht: Springer.

Finkelstein, M., Galaz-Fontes, J. F., & Scott Metcalfe, A. (2009). Changing employment relationships in North America: Academic work in the US, Canada and Mexico. In J. Enders & E. de Weert (Eds.), *The changing face of academic life, analytical and comparative perspectives* (pp. 218–250). London: Macmillan.

Francot, L., & de Vries, B. (2010). Adieu von Humboldt? Over domme organisaties en slimme mensen. In L. J. Dorsman & P. J. Knegtmans (Eds.), *Over Professionalisering van Onderzoek, Bestuur en Beheer* (pp. 73–87). Hilversum: Verloren.

Gottlieb, E. E., & Keith, B. (1997). The academic research-teaching nexus in eight advanced industrialised countries. *Higher Education, 34*, 397–420.

Harskamp, A. V. (1995). Wilhelm von Humboldt: om de eenheid van de universiteit. In T. de Boer & S. Griffioen (Eds.), *Pluralisme, Cultuurfilosofische Beschouwingen* (pp. 30–48). Meppel: Boom.

Hattie, J., & Marsh, H. W. (1996). The relationship between teaching and research: A meta-analysis. *Review of Educational Research, 66*(4), 507–544.

Horta, H., Dautel, V., & Veloso, F. M. (2012). An output perspective on the teaching-research nexus: An analysis focusing on the United States higher education system. *Studies in Higher Education, 37*(2), 171–187.

Jenkins, A., Healy, M., & Zetter, R. (2007). *Linking teaching and research in departments and disciplines*. York: The Higher Education Academy.

Kok, J. M. P., de Jonge, J., & Tom, M. (2007). *Tijdsbesteding Universitair Wetenschappelijk Personeel*. Zoetermeer/Den Haag: EIM/MinOCW.

Lorenz, C. (2008). De Universiteiten en het new public management. In C. Lorenz (Ed.), *If you're so smart, why aren't you rich; universiteit, markt & management* (pp. 165–196). Amsterdam: Boom.

Ministry of Education, Culture and Science. (2011). *Kwaliteit in Verscheidenheid, Strategische Agenda Hoger Onderwijs, Onderzoek en Wetenschap*. Den Haag: Min OC&W.

Philipse, H. (2008). De Universiteit als Vierde Macht. Een pleidooi voor de Tetras Politica. In C. Lorenz (Ed.), *If you're so smart, why aren't you rich; universiteit, markt & management* (pp. 27–41). Amsterdam: Boom.

Robertson, J. (2007). Beyond the 'research/teaching nexus': Exploring the complexity of academic experience. *Studies in Higher Education, 32*(5), 541–556.

Rupp, J. C. C. (1997). *Van Oude en Nieuwe Universiteiten. De verdringing van Duitse door Amerikaanse invloeden op de wetenschapsbeoefening en hoger onderwijs in Nederland, 1945–1995*. Den Haag: SDU.

Shin, J. C. (2011). Teaching and research nexuses across faculty career stage, ability and affiliated discipline in a South Korean research university. *Studies in Higher Education, 1*, 1–19.

van Visser-Wijdveen, G. J. H., Driel, R. M., Rijst, v., Verloop, N., & Visser, A. (2010). The ideal research-teaching nexus in the eyes of academics: Building profiles. *Higher Education Research and Development, 29*(2), 195–210.