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Publisher: Routledge

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Tertiary Education and Management

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rtem20>

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Uwe Wilkesmann ^a

^a TU Dortmund University , Germany

Published online: 09 Jun 2013.

To cite this article: Tertiary Education and Management (2013): Effects of Transactional and Transformational Governance on Academic Teaching: Empirical evidence from two types of higher education institutions, Tertiary Education and Management, DOI: 10.1080/13583883.2013.802008

To link to this article: <http://dx.doi.org/10.1080/13583883.2013.802008>

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Effects of Transactional and Transformational Governance on Academic Teaching: Empirical evidence from two types of higher education institutions

Uwe Wilkesmann*

TU Dortmund University, Germany

(Received 5 February 2013; final version received 29 April 2013)

The leadership literature distinguishes two modes of governance, which can also be applied to the governance of universities: transactional and transformational. Transactional governance encompasses all forms of managerial governance, including selective incentives and monitoring capacity. The theoretical underpinning of this mode can be found in principal–agent theory. Transformational governance covers the means of restructuring the roles of principals and agents or the interaction situation in the organization, and also addresses all the means of restructuring the relationship between perceived environment and motivation, as can be seen in self-determination theory. Other elements of transformational governance are social norms, such as those that inform the quality of research or approaches to teaching. The main research question is: what has more impact on professors' perceptions of the significance attributed to academic teaching in Germany—transactional or transformational governance? Two hypotheses for transactional and two hypotheses for transformational governance are developed. The research question is answered with the help of two quantitative surveys, one conducted in 2009 with a sample of 1119 German research university professors and another conducted in 2011 with a sample of 942 German professors from universities of applied sciences. The main findings are that transactional governance has no impact on the perception of the significance attributed to academic teaching, whereas transformational governance has ample influence.

Keywords: *governance; research universities; universities of applied sciences; self-determination theory; teaching approach*

*Center for Higher Education, TU Dortmund University, Hohe Str. 141, Dortmund, 44139 Germany. Email: uwe.wilkesmann@tu-dortmund.de

Introduction

Universities in Germany are traditionally organized as democratic organizations. In the past, a strong tradition of academic self-governance existed in Germany. The decision-making process was organized to be bottom-up. This was in alignment with the tradition of organizing German clubs (Wilkesmann & Blutner, 2002; Wilkesmann, Blutner, & Müller, 2011), which were structured along the lines of the German registered association (eingetragener Verein or e.V.). This meant that they were configured as special-interest organizations, in which the members decided on the running and development of their association. A very important institution of these types of associations was the members' general assembly, which normally took place once a year and was the highest decision-making body in the organization, based on a "one member, one vote" rule. In the past, academic self-governance at German universities was organized in a similar bottom-up fashion: all of a university's members voted for the Faculty Board and the academic senate. The Faculty Board elected the dean for normally a two- or four-year term. Correspondingly, the academic senate elected the rectorate. The governance practised in the university system in Germany, as in most European countries, has in recent years moved in the direction of new public management (de Boer, Endres, & Schimank, 2007; Deem & Brehony, 2005; Enders, Kehm, & Schimank, 2002; Jansen, 2007, 2010; Kehm & Lanzendorf, 2007; Leišytė, Enders, & de Boer, 2009). Speaking in terms of organizational structure, the organization of German universities has shifted from a club structure to a company structure. The managerial governance has strengthened the hierarchical decision-making processes that prevail in universities. In addition, a number of selective incentives have been introduced in order to steer the behaviour of "lazy" professors.

Transactional Governance

Managerial governance, which includes selective incentives and monitoring capacity, can be seen as a form of transactional governance (Bass & Avolio, 1993; Frost, Osterloh, & Weibel, 2010). Bass and Avolio defined transactional governance as follows: "There is a price on everything. Commitments are short-term. Self-interests are stressed" (p. 116). The theoretical underpinning of transactional governance can be found in principal-agent theory. The principal has to monitor and sanction the agents' behaviour because they are lazy. Frost et al. summarized this as: "transactional solutions may mitigate some problems of joint knowledge work. But the more complex and dispersed among employees knowledge is, the more likely these solutions are to fail" (p. 6).

Transformational Governance

In addition to these forms of transactional governance, transformational governance also influences professors' behaviour. Bass and Avolio described transformational behaviour as follows:

There is a rich set of norms which cover a wide range of behaviors, norms that will adapt to and change with external changes in the organizations' environment. There is much talk at all levels in the organization about purposes, visions, and meeting challenges. (1993, p. 118)

Transformational governance covers, on the one hand, the ways in which the roles of principals and agents can be restructured (Greenwood, Deephouse, & Xiao Li, 2007; Greenwood & Empson, 2003), or the interaction situation in the organization (Wilkesmann, Wilkesmann, & Virgillito, 2009), and, on the other hand, all of the ways in which the relationship between perceived environment and motivation can be restructured (Hackman & Oldham, 1980; Ryan & Deci, 2000, 2006). If the perceived self-determination in the work environment is high, more intrinsic motivation can be said to have occurred; if the perceived self-determination is low, the employees can be said to be a-motivated. Other elements of transformational governance include the organizational culture (Ouchi, 1979; Wilkesmann et al., 2009) and social norms that exist within organizations (Elster, 1989; Inauen, Rost, Osterloh, & Frey, 2010). Professional organizations are governed by social norms (Freidson, 2001; Mintzberg, 1989; Reihlen & Nikolova, 2010), like the norms that guide the quality of good research or approaches to teaching (Prosser & Trigwell, 2006; Trigwell & Prosser, 2004). Both are socialized over a long process of academic education.

Governance at universities is necessary to manage research, but it is essential for teaching because a lot of inherent incentives exist for research (career advancement, reputation, awards, etc.), but not for teaching. Therefore, both types of governance are used to steer the behaviour of academics regarding their efforts in teaching. Transactional forms of governance will be tested in comparison to transformational forms by considering the empirical example of academic teaching in Germany. The primary research question is: what has more impact on professors' perceptions of the significance attributed to academic teaching in Germany—transactional or transformational governance?

The research question will be answered with the help of two quantitative surveys. One survey was conducted in 2009, with a sample of 1119 German research university professors and the second was conducted in 2011 with a sample of 942 German professors from universities of applied sciences.

Theoretical Underpinning

Types of Organizations

Research universities vs. universities of applied sciences. In Germany, there exist two types of higher education institutions, with different organizational structures: research universities and universities of applied sciences. The main differences between these two are, first, to become a professor at a research university, a candidate must have, in addition to a PhD, the "habilitation" (professorship examination) or a successful assistant professorship. For a professorship at a university of

applied sciences, a candidate must have, in addition to a PhD, five years' job experience, including three years in private industry. Second, the teaching load at research universities is normally between eight and nine hours per week; at universities of applied sciences, the teaching load is as high as 19 hours per week. Third, at universities of applied sciences there are no chairs; therefore, only a few research associates will be engaged. In addition, the homogeneity regarding the organizational goal is greater in universities of applied sciences, where it is much more directed toward teaching and professional development, rather than academic education. Universities of applied sciences are, on average, much smaller in terms of number of students and academic staff. Teaching is easier to manage in a top-down manner than is research, and the universities of applied sciences are more or less only responsible for teaching. Universities of applied sciences are closer to being a "complete organization" than research universities, because there is no organizational target conflict (between teaching and research; Brunsson & Sahlin-Anderson, 2000).

Decision-making processes in organizations. We can differentiate between organizations based on their decision-making process: on the one hand, there exist organizations that follow a bottom-up decision-making process, like that practised by clubs in Germany (Wilkesmann & Blutner, 2002; Wilkesmann et al., 2011). These organizations are democratic organizations in which all members have a voice, and all are involved in the decision-making process. On the other hand, there are private companies that mainly follow a top-down decision-making process. The owner or management announces decisions and all members have to obey. This case is theoretically modelled after principal-agent theory. In Germany, the decision-making process at universities of applied sciences leans in the direction of companies, because they are closer to a complete organization, whereas research universities exercise comparatively more self-governance—i.e. they are somewhat more akin to a club. All in all, we predict that at universities of applied sciences more elements of managerial governance will be found than at research universities. If that is the case, we also predict that more transactional forms of governance will be used to manage teaching at universities of applied sciences than are in use at research universities. Therefore, hypothesis 1 summarizes the assumptions as follows:

H1: Transactional governance will have more influence on perceptions of the significance of academic teaching at universities of applied sciences than at research universities.

Principal-Agent Theory

Principal-agent theory is widely accepted among scholars and practitioners of management at universities as the theoretical underpinning of transactional governance and new public management (Lane & Kivisto, 2008; Wilkesmann & Schmid, 2012). According to principal-agent theory, incentive structures are best

suited to overcoming aspects of opportunism, responsibility shirking and goal divergence, which are especially problematic in organizational settings such as professional bureaucracies (Mintzberg, 1989). To ensure compliance with his or her target-setting, the superior (principal) provides some form of external reward or applies coercive authority to enforce the contractual agreement with his or her agent(s). Standard solutions include monitoring, selective incentives and punishment (Eisenhardt, 1989).

Three agency problems—usually all derived from the principal's point of view—complicate the processing of the exchange between the involved parties (Arrow, 1985): hidden characteristics, hidden action and hidden knowledge. If the principal can motivate the agent with the help of selective incentives, it is in the self-interest of the agent not to shirk their responsibilities: "the principal chooses to use outcome-based incentives to overcome in part the problems of moral hazard, despite operating at an informational disadvantage with the agent. This necessarily transfers risk to the risk-averse agent" (Miller, 2005, p. 206). Selective incentives in academia, such as merit pay, are supposed to change the professor's individual payoff (Kollock, 1998). In the case of universities, the efficacy of selective incentives is most likely limited because it is very difficult for superiors or, in the case of teaching, peers to monitor and reward the performance of professors (Frey & Osterloh, 2002). In addition, professors are required and expected to practise research, as well. Most incentives are provided in the form of career progress or an improved academic reputation, and other selective incentives are provided with a focus on research.

Thus, professors face a multi-tasking problem (Holmstrom & Milgrom, 1991): they have to split their time between research, teaching and management. New selective incentives have to focus on teaching because most existing incentives support research activities. Therefore, the principal has to strengthen the least valuable option for action: teaching. In Germany, as well as in other European countries, four main selective incentives already have been implemented in an effort to overcome agency problems: (1) merit pay, (2) performance-related budgeting, (3) management by objectives, and (4) teaching awards. These four instruments are the primary elements of transactional governance.

The following points characterize the German university situation:

- (1) In early 2005, a new salary system ("W-salary") was introduced in Germany to displace the old seniority wage rule ("C-salary"). All professors appointed after January 2005 have been paid according to this new salary system, while the others remain in the old seniority-based wage system. Now, two-thirds of the salary is provided as a fixed-time wage and one-third is performance based. In principle, three different types of performance indicators are applied: (1) appointment negotiation, (2) extra salary for leading a department, and (3) performance bonus for outstanding research or teaching. Only the latter really adheres to pay-for-performance principles.

- (2) Most universities in Germany have introduced performance-related formulas for determining professors' salaries. In most cases, the performance criteria are quantitative in nature and include measures such as third-party funding, number of PhDs, number of students enrolled and their average time to completion.
- (3) Several German universities have established management by objectives (Jaeger, Leszczensky, Orr, & Schwarzenberger, 2005). The president (or rectorate) negotiates cooperatively with faculties and/or with single chairs to reach an agreement on strategic objectives, which include both research and teaching objectives.
- (4) Most universities in Germany award a prize for teaching to enhance the status of academic teaching (Wilkesmann & Schmid, 2010).

The findings can be summarized in hypothesis 2:

H2: The new managerial instruments, as elements of transactional governance, have a positive influence on perceptions of significance attributed to academic teaching.

Theories of Enculturation: Self-Determination Theory

Economic theories of action presuppose an a-cultural conceptualization of actors and relate individual outcomes of action to formal structural variables of governance. In order to effectively steer professors via structural variables toward certain intended behavioural outcomes, it is plausible to further specify the professorate as distinct, self-interested, goal-directed actors. Extended models of cognitive-rationalist approaches to organizing supplement the micro-foundations of the base-line model, specifically the conceptualization of award mechanisms. Self-determination theory (SDT; Ryan & Deci, 2000) is of particular interest here, as it advances the notion that award mechanisms can also be immaterial and have intrinsic sources: "We may say that it is this intrinsic motivation which makes academics commit themselves to their scholarly activities not as a job but as a vocation, profession and hobby; which sustains them despite deteriorating working conditions and salaries" (Moses & Ramsden, 1992, p. 105). Intrinsic motivation is one of the main elements of transformational governance (Frost et al., 2010). For Ryan and Deci (2006), there exists a correlation between organizations' structure and motivation. They explain autonomy as self-governance and heteronomy is, "experienced as alien or pressuring, be they inner impulses or demands, or external contingencies of reward and punishment" (p. 1562). To obtain a more differentiated picture of academics' motivation to teach, we applied the SDT of motivation (Ryan & Deci, 2000). The question is, is it intrinsic, self-determined motivation that is the dominant explanation for professors' engagement in and commitment to teaching? SDT would claim that different types of motivation can be arranged along a continuum between non-self-determined (amotivational) and self-determined (intrinsic motivation) behaviour (see Figure 1).

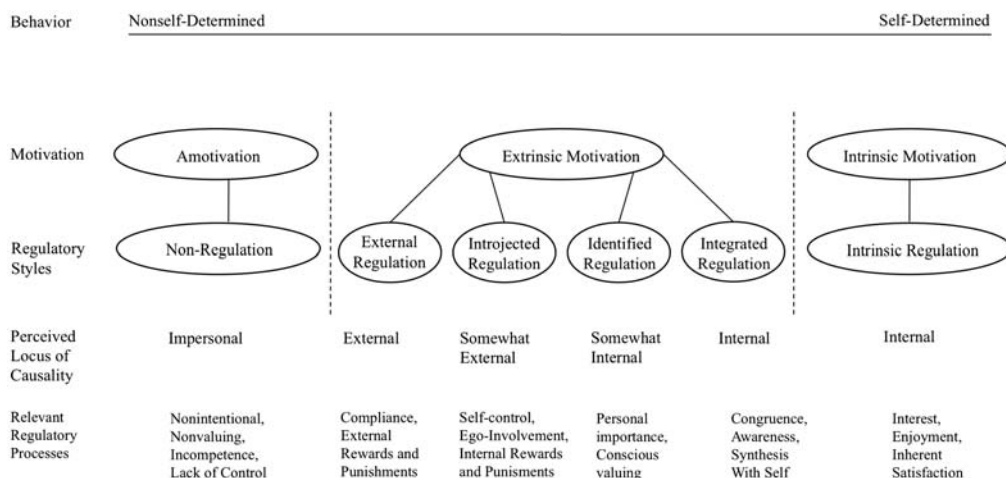


Figure 1. Self-determination theory (Ryan & Deci, 2000, p. 72)

Therefore, hypothesis 3 asserts that:

H3: The greater the self-determination (in alignment with SDT), the greater are the perceptions of significance attributed to academic teaching.

Theories of Enculturation: Teaching approach

According to principal-agent theory, actors behave without learning processes, without socialization. The formation of preferences has no place in rational choice theories (Vaughan, 1998). Preferences are the results of socialization processes, an enculturation process in a specific (organizational) culture. In universities, all members have a long history as students and as a part of the academic staff, and conceptions of teaching are a part of those socialized practices. Therefore, the teaching approach could be used as a predictor for a specific socialization process:

Each academic’s conception of teaching will have formed through some complex amalgam of influences such as experiences as a student, departmental and institutional ethos, conventions of the discipline and even the nature of the classroom. As teaching is central to the role of academics, conceptions of teaching tend to become subsumed into the unconscious. It, therefore, takes a major perspective transformation to change them. (Kember, 1997, p. 271)

Such a process of academic socialization is a good example of transformational governance.

To describe (the style of) teaching as a result of institutionally socialized behaviour, we use here Prosser and Trigwell’s approaches to teaching (Trigwell & Prosser, 2004; Trigwell, Prosser, & Taylor, 1994). This provides us with a concept that allows us to understand teaching beyond the influence of intended extrinsic regulation via structural properties. Academics’ approaches to teaching have been

analysed in terms of the strategies they adopt and the intentions underlying those strategies (Trigwell & Prosser, 1996, p. 78). The authors distinguish between two general types of teaching: a teacher-focused approach, in which the teacher only transfers information to the students; and a student-focused approach, in which the teacher helps the students change their worldviews by developing their own new knowledge. The first approach is in alignment with the parcel model of knowledge transfer and the latter with an interaction model of knowledge transfer (Wilkesmann & Wilkesmann, 2011; Wilkesmann et al., 2009). The teaching approaches can be interpreted as general attitudes toward the practice of teaching, which is the product of organizational socialization.

H4: The more student-focused the teaching approach, the greater is the perception of significance attributed to academic teaching.

Empirical Evidence

Survey Design

The hypotheses were tested with the help of two surveys. We conducted the first survey at research universities in Germany between May and July, 2009 (see Wilkesmann & Schmid, 2012), and the second survey at universities of applied sciences in Germany between March and April 2011. The target population was all German professors at both types of universities.

For the first survey (Wilkesmann & Schmid, 2012), we selected 8000 research professors from the email distribution list of the German Association of University Professors (DHV). Professors paid within the framework of the new pay-for-performance salary (W-salary) scale were of special interest for the study, so we opted for a disproportionate stratified sampling approach that differentiated between two strata according to salary categories (merit pay vs. the age-related seniority scheme); 1119 professors completed the survey, yielding a response rate of 14%.

In order to get a more complete picture of possible non-response and the representativeness of the sample, we examined differences between respondents (sample) and the general population. The population data were requested and retrieved from the German Federal Statistical Office, which keeps precise records about the population of higher education institutions and their personnel. Table 1 shows the comparison between sample and population parameters across various central categories.

The second survey was supported by an email list of the German Association of University of Applied Sciences Professors (HLB). The HLB organizes all professors at universities of applied sciences, but the address list includes only the deans of all German universities of applied sciences. We checked all email addresses and sent an email with a link to the online questionnaire, and the request to forward this email to all professors at their faculty. All in all, 942 professors completed the questionnaire. Due to the distribution method, we can say nothing about the

Table 1. Comparison sample—population (survey 1)

Variable	Percentage within population		Percentage within sample	
	Percentage	<i>n</i>	Percentage	<i>n</i>
Old wage class C (C3 + C4)	68.6	14,338	41.5	458
New wage class W (W2 + W3)	31.4	6569	58.5	645
Male	79.9	19,109	77.7	826
Female	20.1	3914	22.3	237
Age (Mean)	49.7	23,023	49.0	1030
Linguistics and cultural studies	21.4	4915	26.1	292
Law, economics and social sciences	14.8	3413	18.3	205
Mathematics and natural sciences	24.7	5678	27.2	304
Medicine, veterinary medicine and pharmacy	13.5	3105	7.9	88
Forestry, agricultural science, nutritional science	1.8	421	1.3	12
Engineering	9.9	2282	7.0	78
Science of art	11.7	2687	1.2	13
Sports	.8	187	.5	6

response rate, but the sample covers 6% of the population of all professors at universities of applied sciences.

As for Survey 1, Table 2 provides a comparison between the Survey 2 sample and the population of all professors at universities of applied sciences.

Both surveys' samples are representative regarding faculties, gender and age, but not regarding payment scheme. Therefore, we used a weighting factor for

Table 2. Comparison sample—population (survey 2)

Variable	Percentage	
	Percentage within population	Percentage within sample
Old wage class C (C3 + C4)	60.9	52.2
New wage class W (W2 + W3)	39.1	47.8
Male	81.6	78.7
Female	18.3	21.3
Age (Mean)	50.8	50.3
Linguistics and cultural studies	3.28	2.0
Law, economics and social sciences	35.4	31.4
Mathematics and natural sciences	13.7	15.0
Medicine, public health	1.6	2.0
Forestry, agricultural science, nutritional science	3.4	3.7
Engineering	37.9	42.9
Science of art	4.5	2.8
Sports	.04	–

descriptive statistics, but there was no need to weight the disproportionate strata for the purpose of multivariate analysis because we integrated the respective variables into the model.

The Dependent Variable

Up to now, there has been no definition of academic teaching that covered all areas of action involved in fulfilling the task of teaching beyond the domain of actual seminars or courses taught (Cashin, 1989). Drawing from Cashin's proposal of an expanded definition of teaching, and with the help of experts in didactics, we have developed our own inventory of academic teaching (see Wilkesmann & Schmid, 2012).

Our interest is focused on the organizational aspect—i.e. on teaching behaviour. Therefore, it is not our task to assess teaching quality, and so we were content to ask about: (1) the attributed significance of teaching, which includes the level of the professor's self-reported importance they attribute to their engagement in a specific task ("How important is it for you to ..."); and (2) the perceived real effort put into teaching behaviour to realize these intentions or preferences ("How much effort does it actually take for you to ..."). All items were measured on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree). In the following, we selected only the aspect of methods of instructional design: here, the items cover the conceptualization of methods of instruction, the availability of additional learning aids, the social organization of instruction (formation of learning/working groups, coordination of project teams, etc.), the audio-visual means of instruction and the conceptualization and communication of instructional goals (for the actual items, see Table 3).

The outcome of a principal component analysis with varimax rotation is one factor with a KMO-value of .77 and explained variance of 50.5% (see Table 3). The Cronbach's alpha of the scale is .75.

Table 3. Principal component analysis of significance methods

DV: significance methods	
How important is it for you to principally put effort into teaching so as (<i>significance methods</i> $\alpha = .75$)	
... to develop specific methods of instruction (e.g. discussions, lectures, experiments, case studies)?	.772
... to enrich the courses' teaching/learning process with additional learning aids (e.g. handouts, motivational instructions, web-based resources, etc.)?	.757
... to conceptualize/organize the social organization of the teaching-learning-processes (e.g. cooperative learning groups, project teams)?	.775
... to conceptualize/organize the use of audio-visual means of instruction (e.g. instructional films, e-learning, audio-tapes, projector)?	.658
... to conceptualize and communicate clear educational/instructional goals for your respective courses (e.g. content [area] coverage, intended learning outcomes [such as higher-order problem-solving skills])?	.568

Two ordinary least squares regressions are estimated with this dependent variable: one for the universities of applied sciences and one for research universities. Hypothesis 1 will be supported if different independent variables have a significant influence on the dependent variable.

The Independent Variables

New managerial instruments. Merit pay in academia is measured via the two following dummy variables: “Do you have merit pay for teaching at your university?” and “Are you receiving merit pay for teaching?”

In order to measure management by objectives, a dummy variable was constructed that differentiated between percentage-based budgeting mechanisms that distributed at least some percentage on the basis of teaching performance, and those that did not include teaching. The original item was: “Based on the overall formula-based budget mechanism at your university, what percentage of the tangible means/staff appropriations is distributed according to criteria of teaching performance?” To collect data on the use of teaching awards, we asked, “Does your university promise a teaching award that you could potentially win?” and “Have you ever won a teaching award?”

Self-Determination Theory. To test hypothesis 3, we used items from Fernet, Senécal, Guay, Marsh, and Dowson’s (2008) Work Tasks Motivation Scale for Teachers, which we translated into German and supplemented with a few items out of Vallerand et al.’s (1992) Academic Motivation Scale. Both questionnaires are reliable tools for modelling Ryan and Deci’s SDT of motivation (2000), but without the type of motivation, “integrated regulation”. No empirical evidence was found in past surveys for this type of regulation; therefore, Deci and Ryan omitted it. All items were measured on a five-point Likert scale. The data from both surveys were tested via a confirmatory factor analysis. We can only observe a good model fit with ULS estimation when identified regulation was assigned to intrinsic motivation (GFI = .980; ABFI = .970; RMR = .061; see Figure 2). In addition, one item from introjected motivation had to be deleted because of a very low loading (“Because I would feel bad if I would neglect my task of teaching”). In the end, we found four—instead of five or the original six—types of motivation: intrinsic motivation (Cronbach’s $\alpha = .791$), introjected motivation (Cronbach’s $\alpha = .633$), extrinsic motivation (Cronbach’s $\alpha = .681$) and amotivation (Cronbach’s $\alpha = .615$).

Each dimension is used as an independent variable. Hypothesis 3 will be supported if the self-regulated types of motivation (intrinsic motivation) will be shown to have a positive impact on the dependent variable, but not the non-self-regulated types of motivation (extrinsic motivation and amotivation).

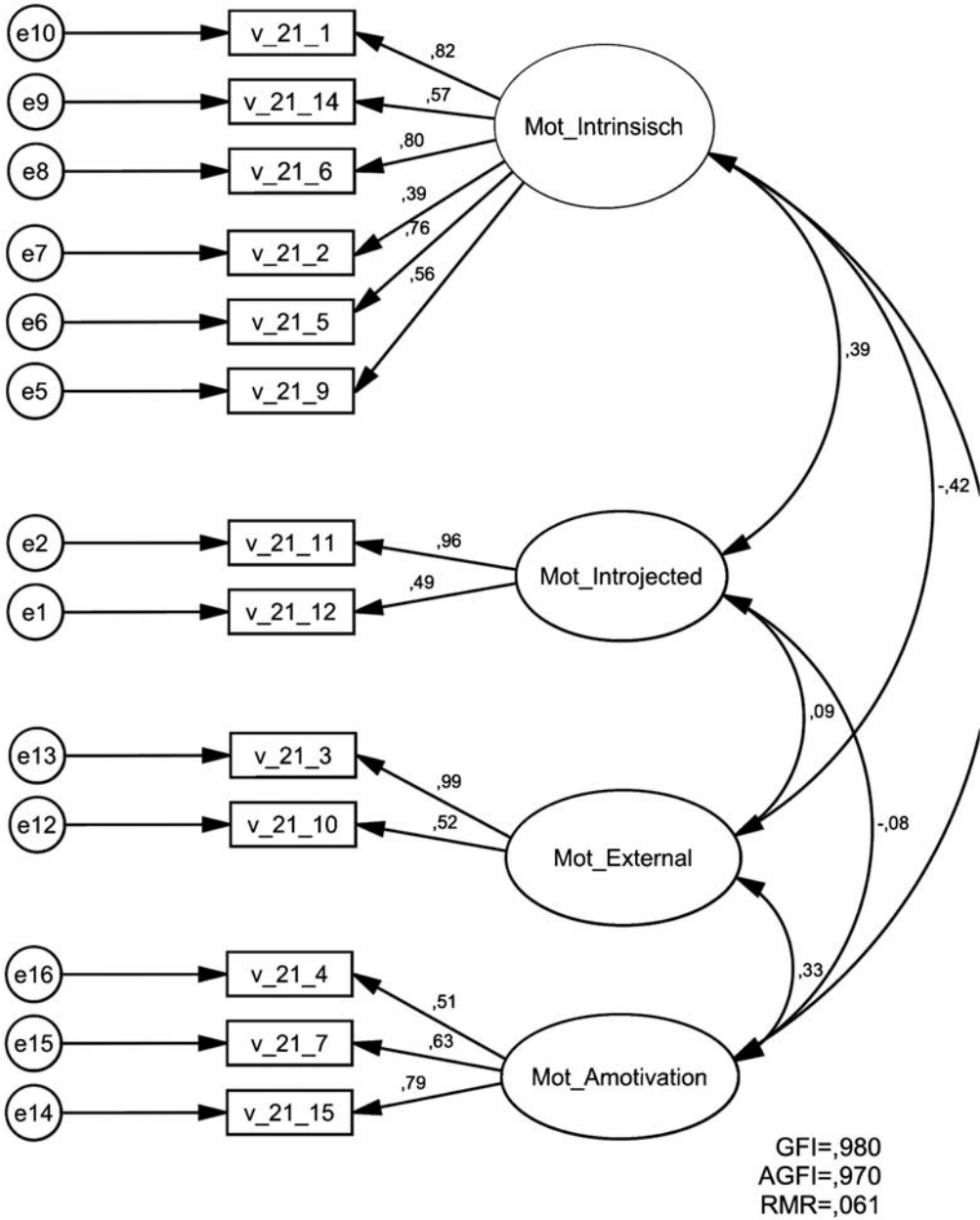


Figure 2. Confirmatory factor analysis for research universities and universities of applied sciences

Theories of enculturation: teaching approach. To measure aspects of enculturation, we collected data on teaching approach (hypothesis 4) by translating Prosser and Trigwell's (2006) inventory. A principal component analysis with varimax rotation of Prosser and Trigwell's (2006) items shows two latent variables (KMO-value

Table 4. Principal component analysis of teaching approaches

	Factor	
	TF	SF
Teacher focused: $\alpha = .661$		
In this subject students should focus their study on what I provide them	.495	
I structure my teaching in this subject to help students pass examinations	.750	
I present material to enable students to build up an information base in this subject	.690	
In my teaching I try to cover the subject in a way it might also be presented in key readings and textbooks	.630	
I should know the answers to any questions that students may put to me concerning the content of my courses	.560	
It is important to present a lot of facts to students so that they know what they have to learn for this subject	.531	
Student focused: $\alpha = .552$		
In my teaching I invest a lot of time concerning myself with the knowledge creation of my students		.734
I set aside some teaching time so that students can discuss, among themselves, ideas in this subject		.635
It is better for students in this subject to generate their own notes rather than copy mine		.577
My teaching should enable my students for self-directed learning processes		.635

Notes: TF = teacher focused, SF = student focused.

.739; explained variance of 41.24%)—teacher-focused (Cronbach’s $\alpha = .661$) and student-focused (Cronbach’s $\alpha = .552$; see Table 4). The Cronbach’s α for the student-focused scale was not proven to be satisfactory because we used a short-scale version of four items instead of the original scale, which included eight items; although sub-optimal with regards to reliability, this was deemed necessary due to issues of test length (Schmitt, 1996). Even though this scale has a low estimated reliability, it nevertheless contributed significantly to the explanatory power of the regression model.

In addition, in the regression analysis, the following control variables were integrated: gender, age, wage system and, only for professors at research universities, we asked if they had worked in a private company for more than three years prior to their appointment at the university. For professors at universities of applied sciences, this criterion is a prerequisite for appointment.

Empirical Results and Findings

First, we have provided a descriptive analysis of the independent variables as they compare between the two types of universities. Figure 3 shows that the dependent

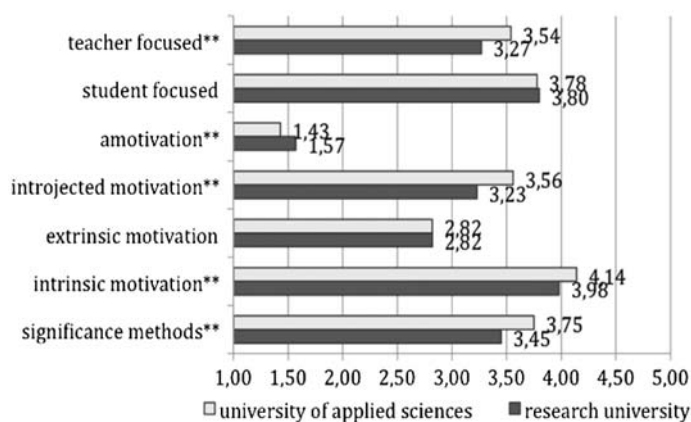


Figure 3. Comparison means of independent variables between research universities and universities of applied sciences (research universities, $n = 1104$ – 1108 ; universities of applied sciences, $n = 905$ – 912)

Note: level of significance 1% (**); 5% (*).

variable “significance of methods” is higher at universities of applied sciences than at research universities, as is a teacher-focused teaching approach. A second interesting finding is that professors at universities of applied sciences have a higher intrinsic teaching motivation, even though they have double the teaching load compared to professors at research universities.

Ordinary least squares regression analyses were used to test the hypotheses (Table 5). Two multiple regression models were estimated for both types of universities in Germany to test impacts on the dependent variable’s “significance to methods of instructions”. All effect sizes are represented by standardized regression coefficients.

We have to reject hypothesis 1 (Transactional governance will have more influence on the perception of the significance of academic teaching at universities of applied sciences than at research universities). Even though the bivariate analysis has shown some differences between the two types of universities (see Figure 3), the multiple analyses cannot confirm this finding except for one minor difference: professors subject to the new merit pay scheme at research universities attach a greater perception of significance to academic teaching.

We have to reject hypothesis 2 as well (The new managerial instruments as an element of transactional governance have a positive influence on perceptions of significance attributed to academic teaching). No new transactional management instrument has had an impact on the perception of significance attributed to academic teaching.

Hypothesis 3 was supported (The greater is the degree of self-determination (in alignment with SDT), the greater is the perception of significance attributed to academic teaching). As expected, intrinsic motivation as a central element of transformational governance, the motivation related to the highest form of self-determined behaviour and the intrinsic regulatory style all have a positive influence on

Table 5. Ordinary least squares regression models

		Significance methods	
		Universities of applied sciences (stand. regression coef.)	Research universities (stand. regression coef.)
H 2 managerial governance	Merit pay for teaching at university (1 = yes; 0 = no)	.000	-.011
	Receiver of merit pay for teaching (1 = yes; 0 = no)	.013	.008
	Agreement on objectives includes teaching (1 = yes; 0 = no)	.040	.028
	Teaching award at university (1 = yes; 0 = no)	-.027	-.038
	Teaching award winner (1 = yes; 0 = no)	.041	-.045
H 3 SDT	Intrinsic teaching motivation	.236**	.155**
	Extrinsic teaching motivation	-.041	-.035
	Introjected teaching motivation	.025	.033
	Amotivation	.046	.022
H 4 teaching approach	Teaching approach: student focused	.310**	.303**
	Teaching approach: teacher focused	.016	.077**
Control variables	Gender (1 = male; 0 = female)	-.147**	-.144**
	Age	-.034	.018
	Payment scheme (1 = new merit pay)	.028	.099*
	More than 3 years in a private company	-	.113**
	<i>n</i>	832	1013
	Adjusted <i>r</i> ²	.220	.206

Note: Level of significance 1% (**); 5% (*).

the significance attributed to academic teaching. Conversely, extrinsic motivation had a negative but not significant impact on the dependent variable.

We can also affirm hypothesis 4 (The more student focused the teaching approach, the greater is the perception of significance attributed to academic teaching). The adoption or application of a student-focused teaching approach had a huge positive impact on the significance attributed to academic teaching. In

Table 6. Ordinary least squares regression models including the disciplines

		Significance methods	
		Universities of applied sciences (stand. regression coef.)	Research universities (stand. regression coef.)
H 2 managerial governance	Merit pay for teaching at university (1 = yes; 0 = no)	-.006	-.009
	Receiver of merit pay for teaching (1 = yes; 0 = no)	.014	.017
	Agreement on objectives includes teaching (1 = yes; 0 = no)	.045	.032
	Teaching award at university (1 = yes; 0 = no)	-.021	-.033
	Teaching award winner (1 = yes; 0 = no)	.041	-.035
	H 3 SDT	Intrinsic teaching motivation	.236**
	Extrinsic teaching motivation	-.042	-.033
	Introjected teaching motivation	.016	.026
	Amotivation	.044	.014
H 4 teaching approach	Teaching approach: student focused	.315**	.286**
	Teaching approach: teacher focused	.009	.093**
Control variables	Gender (1 = male; 0 = female)	-.152**	-.128**
	Age	-.036	.013
	Payment scheme (1 = new merit pay)	.025	.079*
	More than 3 years in private companies	-	.108**
Disciplines (reference: medicine)	Engineering (1 = yes; 0 = all others)	.101	.035
	Humanities (1 = yes; 0 = all others)	.035	.078
	Social science and law (1 = yes; 0 = all others)	.093	-.034
	Math and natural sciences (1 = yes; 0 = all others)	-.004	-.076
	<i>n</i>	809	993
	Adjusted <i>r</i> ²	.227	.222

Note: Level of significance 1% (**); 5% (*).

addition, it was interesting to note that female professors attributed a greater significance to academic teaching than did male professors.

In addition, in another regression analysis, the disciplines were integrated as independent variables (see Table 6). There was no empirically observable, significant influence on the part of the discipline.

Discussion and Conclusion

As the data has shown, transactional governance (based on hypotheses 1 and 2) has no impact on the significance attributed to teaching methods. We can observe that transformational governance (based on hypotheses 3 and 4) in universities as organizations can better explain perceptions of the significance attributed to academic teaching. In particular, teaching has lower status and impact for academic careers than research. Therefore, a theoretical argument exists that selective incentives could support positive teaching behaviour and promote the status of teaching. The empirical results show that this is not true in the case of German universities. To the contrary, we find ample evidence that transformational factors such as intrinsic motivation and teaching approaches have an impact on the significance of teaching. If academic teaching is to be strengthened, the universities should use transformational governance and not selective incentives. Transformational governance means, in this case, to develop a “supportive teaching culture” (Deem & Lucas, 2007; Paulsen & Feldman, 1995) to socialize professors and to increase intrinsic teaching motivation.

A supportive teaching culture includes a highly symbolic appreciation of academic teaching from the top of the organization (e.g. the rector, the vice-president, etc.) and offering general conditions that genuinely support teaching, such as well-equipped classrooms, support for developing innovative teaching methods, etc. Furthermore, it means to increase the commitment to discuss new teaching methods with colleagues, and to build an atmosphere in which speaking about teaching is the accepted norm.

Further research must be done to explain in depth what transformational governance is and how we can explain its effectiveness. In the case of academic teaching, some universities have experimented with special forms of transformational governance that should enhance the status of academic teaching:

- (1) *A sabbatical for developing new teaching methods* could increase the leeway of action for developing new schools of thought and give the time required to do so.
- (2) *Mentoring programmes* could emphasize the outstanding relevance of teaching. An experienced colleague can support a “freshman”.
- (3) *Collegial team coaching for teaching*, if it is voluntary, could lend support and assistance for the development of good teaching practice.

Nevertheless, for evidence-based management, we need further research to test whether these forms of transformational governance are effective. Governance is not an end in itself, it is only effective if it steers professors' behaviour.

Acknowledgements

The data collection has been financed by the German Research Foundation (project-ID: WI 2052/2-1 and WI 2052/2-2).

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