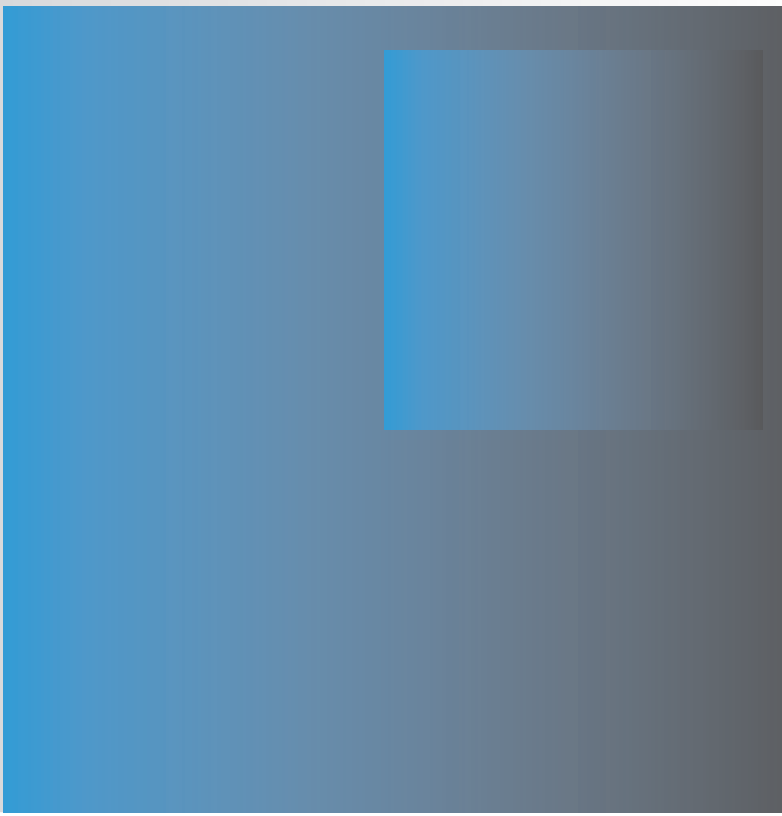
Higher Education Management and Policy

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ON INSTITUTIONAL MANAGEMENT
IN HIGHER EDUCATION



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Critical masses for academic research groups and consequences for higher education research policy and management

by
Ralph Kenna and Bertrand Berche
Coventry University, United Kingdom and University of Nancy, France

Smaller universities may produce research which is on a par with larger, elite establishments. This is confirmed by a recently developed mathematical model, supported by data from British and French higher education research-evaluation exercises. The detailed nature of the UK system, in particular, allows quantification of the notion of critical mass in research. It is shown that research quality increases with group quantity, but only up to a limiting size referred to as the upper critical mass. The condition for smaller universities to produce top-quality research is that they contain research groups of sizes above the upper critical masses appropriate to their respective disciplines. Policies which concentrate support into progressively fewer, larger institutions are therefore unjustified for high-quality academic research. Instead, to amplify overall research strength, support for medium-sized groups should be prioritised to help them attain upper critical mass.

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Masses critiques pour les groupes de recherche académiques et conséquences pour la politique sur la recherche et la gestion de l'enseignement supérieur

par
Ralph Kenna et Bertrand Berche
Université de Coventry, Royaume-Uni et Université de Nancy, France

Les plus petites universités peuvent mener des recherches dont les résultats rivalisent avec ceux des centres d'excellence. Ceci a été confirmé par un modèle mathématique récemment développé, dont les données proviennent d'exercices d'évaluation et de recherche de l'enseignement supérieur français et britannique. La nature du système particulièrement détaillé au Royaume-Uni permet de quantifier la notion de masse critique dans la recherche. Il est démontré que la qualité de la recherche augmente proportionnellement à la dimension du groupe, mais seulement jusqu'à une taille limite appelée la masse critique supérieure. La condition permettant aux plus petites universités de mener des recherches d'excellente qualité est d'inclure des groupes de recherche dont la taille dépasse la masse critique supérieure de manière appropriée dans chacune de leurs disciplines respectives. Les politiques, qui concentrent de moins en moins leur soutien aux grands établissements, sont donc injustifiées pour ce qui est de la recherche académique de premier ordre. Au lieu de cela, donner priorité aux groupes de taille moyenne afin de leur permettre d'atteindre un niveau de masse critique supérieur permettrait de renforcer les points forts de la recherche.

Introduction

The notion of critical mass in academic research groups is an old one which, despite lacking clear definition, feeds into policy and management decisions at department, institution and government levels. The traditional notion is that there is a minimum, threshold size which a research group or department must reach in order to produce high-quality research (Harrison, 2009; Evidence, 2010). The extended notion that benefit accrues through increasing scale lies behind recent calls for a greater concentration of resources into fewer, elite universities (*e.g.* Russell Group, 2010; 1994 Group, 2010). However, recent empirical findings by Adams and Gurney (2010) provided evidence that this is not, in fact, the case. Their citation count analysis showed that the impact of smaller research-intensive universities' publications is mostly on a par with that of larger, elite ones. The purpose of this paper is to explain why this is the case.

The explanation originates from a new notion of critical mass in research. In our earlier papers (Kenna and Berche, 2010, 2011) we showed that old notions of critical mass and related or extended concepts are flawed and in need of refinement; we also proposed new, testable and robust definitions. Taking the theory a step further, we now apply it to different types of UK universities to explain the Adams-Gurney findings. In addition, this paper focuses on implications for higher education management and policy.

Peer review assessments of group or departmental quality offer opportunities to test concepts around critical mass, including the relationship between quality and quantity in research. National research evaluation systems such as the UK's Research Assessment Exercise (RAE) and the French equivalent, which is performed by the Agence d'évaluation de la recherche et de l'enseignement supérieur (AERES) form bases on which governments, funding councils, higher education institutes and research groups formulate policies on where to focus investment. In this paper, we compare recent RAE and AERES evaluations. While they are compatible, the UK exercise is more detailed than the French one. This level of detail allows the notion of critical mass in research to be refined and gives rise to a better understanding of how the quality of group research depends on quantity.

Implicit in the notion of critical mass is the idea that interactions between individual researchers within a group are important. But the question as to how these interactions feed into emergent group quality has

not been addressed until now. It is seen that such interactions lead to a linear increase of research quality with group quantity, but only up to a limiting size, beyond which meaningful collaborations between all group members cannot be sustained. Beyond this limit – denoted as the **upper critical mass** – research groups tend to fragment; increased concentration of resources does not lead to continued significant increases in research quality. This explains recent findings which showed that smaller universities' research can combine excellence with impact on a par to that of larger, elite establishments (Adams and Gurney, 2010): the condition for doing so is that they both contain research groups whose sizes tend to exceed the upper critical masses. This is the main policy-related message of this study.

This paper thus extends our earlier work (Kenna and Berche, 2010, 2011) to specific areas of concern to management and policy makers in higher education. In order to render it complete, in the next section we offer a condensed, non-technical summary of the theory. Some overlap with our earlier papers is therefore necessary and the reader is referred there for more technical expositions of the mathematics and statistical analyses. In the subsequent sections we describe research quality assessment schemes in the United Kingdom and France and give more detail of the UK higher education sector. After a discussion of causality and caveats we offer an explanation for the Adams-Gurney (2010) findings; conclusions for higher education management and policy are drawn in the final section.

The dependency of research quality on group quantity

There are two viewpoints in the current debate on the nature of the relationship between research quality and group quantity (Harrison, 2009). On the one hand, there are arguments to the effect that bigger tends to be better, that benefit accrues through scale and that research support should focus on a few, elite higher education institutes which already have significant resources (Russell Group, 2010; 1994 Group, 2010). The second viewpoint is that quality and quantity are independent and that resources should be allocated to wherever research excellence is found (University Alliance, 2009; Million+, 2010). Harrison (2009) gives a qualitative discussion of the ongoing debate between the two sides of the argument in the United Kingdom.

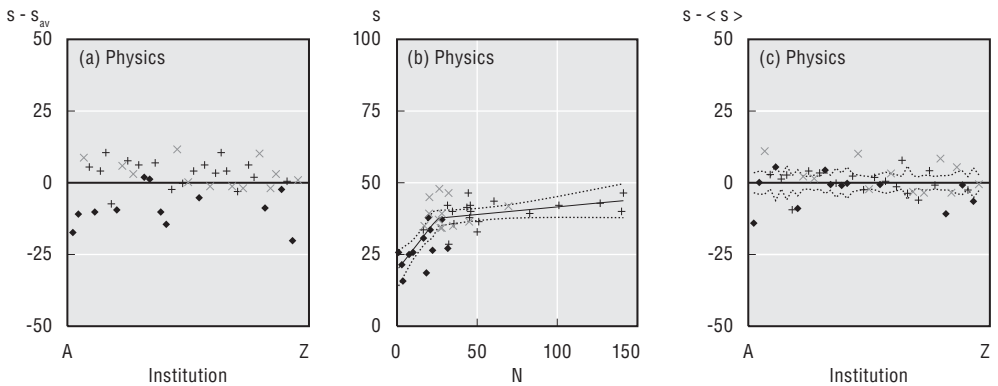
In France, the "Opération Campus" provoked a similar debate (Ministère de l'enseignement supérieur et de la recherche, 2011). This was introduced by the government with a view to identifying specific universities into which funding would be channelled in order to enhance research and teaching infrastructure, as well as accommodation. The agenda continued with so-called "excellence initiatives" in which between five to ten facilities in the country were earmarked for greater public research funding (Agence nationale de la recherche, 2011). Both programmes have been criticised by researchers

who were largely in favour of a more even distribution of public investment (Sauvons la Recherche, 2011). Thus the issue of how quality (of research) is related to quantity (of investment) is one of immediate and simultaneous concern in different countries.

A new, agent-based mathematical theory was introduced by Kenna and Berche (2010) and subjected to statistically rigorously testing (2011). This theory addresses the relationship between research quality and group quantity. It indicates that quality is indeed strongly dependent on quantity, but only up to a limit termed the upper critical mass. Beyond this limit, the relationship between quality and quantity becomes less significant or even disappears. Thus the mathematical theory offers support for aspects of both viewpoints, but each is only valid in a certain size regime. The basic reasoning behind this theory is outlined below; see Kenna and Berche (2010) for a detailed, mathematical exposition.

Ceteris paribus, it may be argued that a research group or department containing, say, ten active scientists may, on average, be expected to produce twice as many papers, train twice as many PhD students and generate twice as much income as a group of five. According to this expectation, the **strength** of a research group is approximately proportional to the number of individuals it contains. If one defines the **quality** of a research group as the average strength per head, then quality is simply given by the mean calibre of the individuals in the group. According to this argumentation, different groups would have qualities distributed around an average. Figure 1(a) illustrates such a distribution in the

Figure 1. **Quality analysis for physics research groups**



Note: (a) RAE quality scores, normalised to the overall discipline average for physics groups which are listed alphabetically, from Aberystwyth University to the University of the West of Scotland. The symbols + and × correspond to universities from the Russell and 1994 groups of large and smaller research-intensive universities, respectively, while the ◆ represent other higher-education establishments in the UK. (b) The same data plotted against the sizes *N* of research groups where the solid curve is the fit coming from the model and the dashed curves are the corresponding 95% confidence intervals. (c) Quality is renormalised to the expectation values $< s >$ coming from the model.

case of physics groups submitted to the RAE. In the plot, the difference between group quality s and the mean quality s_{av} is compared against the institutions listed alphabetically. (The precise manner in which the quality measures s are determined and the meaning of the various symbols in the figure are explained below.) The extent to which a group's research quality is higher or lower than average is a function of many parameters such as the innate calibre, education and experience of its members, the quality of managerial support and of facilities and infrastructure, the impact of external and international collaborations, the prestige and confidence inspired by the institution and by past successes, etc. All of these parameters contribute to the quality of an individual group but, in general, research quality is size independent according to this argument. Figure 1(a) gives no indication as to the best policy to maximise the quality of a research group apart from simply recruiting members of high individual calibre in order to increase the strength of the group.

However, it would be naive to retain this viewpoint alone because it neglects the importance of interactions between group members. This is despite the concept of such interactions being vaguely linked to that of "critical mass" as advocated by proponents of this viewpoint. In this context, critical mass has been loosely described as some kind of threshold group size for effective performance, although no quantitative evidence for the existence of such a threshold has ever been presented (Evidence, 2010). In Figure 1(b), quality s is plotted against quantity N for physics. Also, there is no evidence here of a minimum group size above which there is a stepwise increase in research quality. On the contrary, group quality tends to rise continuously with quantity until a certain critical size is reached at about $N \approx 25$. Beyond this size, research quality appears to be independent of group quantity. What is the reason for this behaviour?

According to the theory developed in Kenna and Berche (2010, 2011), if there are N members of a group, the total number of pairs of individuals along which channels of communication can open is $N(N-1)/2$. The total **strength** of the research group is then quadratically dependent on its size. The **quality** of the group (its strength per head) is therefore a linear function of group size. This explains the steady rise of research quality with group quantity in the left part of Figure 1(b), up to about $N \approx 25$. These considerations assume that a significant proportion of all potential two-way communication links are active. Beyond a certain group size, however, it is not possible for every individual to meaningfully interact with everyone else. Suppose that the average maximum number of colleagues with whom a given individual can communicate is N_c. It follows that when the actual group size N exceeds this number, the total number of interaction links is $NN_c/2$. In this case, the strength of the group is only linearly dependent on group size, so that the quality of the group is essentially constant. Such large groups can fragment

into subgroups whose average size is less than N_c. There can also be connections between subgroups. Such connections give rise to a weaker quadratic dependency of strength on quantity and therefore to another linear relationship between quality and quantity.

To summarise, a simple model, developed by Kenna and Berche (2010, 2011) taking into account the importance of communication links between individuals and between sub-groups, leads to a piecewise linear dependency of group quality on quantity. Mathematically, this is expressed as follows:

$$< s > = a_1 + b_1 N \text{ if } N \leq N_c \qquad \text{Equation 1(a)}$$

or

$$< s > = a_2 + b_2 N \text{ if } N \leq N_c \qquad \text{Equation 1(b)}$$

where N represents the size or quantity of the research group, $< s >$ represents its expected research quality and the coefficients a_1, b_1, a_2 and b_2 are characteristic of the academic discipline under consideration. The terms a_1 and a_2 correspond to the average individual strengths while b_1 and b_2 measure strengths of interactions. These parameters can be estimated using least squares statistical approaches.

In Figure 1(c), the difference between **actual** and **expected** quality is plotted against the size of physics groups at RAE. The data is more closely bunched than the equivalent display in Figure 1(a). In fact, the standard deviation associated with Figure 1(c) is about 5, significantly less than that associated with Figure 1(a), where it is 8. This illustrates the superiority of the model (1) over the alternative notion that quality is independent of quantity.

Interestingly, then, while group quality increases in step with the calibre of individuals, this is not the dominant mechanism for enhancing quality. In fact, it is an order of magnitude smaller than the collaborative effect. The limit N_c, where the pattern of communications within the group changes on average, is referred to as the **upper critical mass**. This is currently the only quantitative definition of critical mass in the literature. In Kenna and Berche (2011), statistical hypothesis testing was applied to data from the United Kingdom's RAE to establish the validity of the model and critical masses were determined for a multitude of academic research disciplines. For completeness of the current exposition, the resulting critical masses are listed in Table 1.

The model allows for a definition of another critical mass in research (Kenna and Berche, 2010). The expected strength of a research group is determined by the product of its quality and quantity $< s > N$. The gradient of this strength function for $N < N_c$ exceeds that for $N > N_c$ provided $N < N_k$ where N_k is:

$$N_k = N_c/2 \qquad \text{Equation 2}$$

Table 1. **Estimates for the upper critical masses for a variety of academic disciplines, as illustrated in Kenna and Berche (2011)**

Research discipline	Upper critical mass N_c	Research discipline	Upper critical mass N_c
Applied mathematics	13 ± 2	Pure mathematics	≤ 4
Physics	25 ± 5	Biology	21 ± 4
Geography/environment	30 ± 3	Chemistry	36 ± 13
Medical sciences	41 ± 8	Nursing	18 ± 5
English (in the UK)	32 ± 3	Foreign languages	6 ± 1
Agricultural sciences	10 ± 3	Architecture/planning	14 ± 3
Law	31 ± 4	Education	29 ± 5
Economics/econometrics	11 ± 3	Business/management	48 ± 8
Politics/international	25 ± 5	Sociology	14 ± 4
History	25 ± 5	Philosophy/theology	19 ± 3
Art and design	25 ± 8	History of art, performing arts, communication and music	9 ± 2
Archaeology	17 ± 3		

This means that to maximize the strength of a given discipline, it is best to support groups which are smaller in size than N_c in order to drive them towards the upper critical mass. However, this policy only makes sense if these groups are not too small. In fact, defining a research group of size N to be:

small, if$N \leq N_k$

medium, if$N_k \leq N \leq N_c$

large, if$N \geq N_c$

then, in order to maximise the overall strength of a research discipline, it is best to prioritise support for medium-sized groups. Small groups, on the other hand, must strive to achieve the lower critical mass to survive.

While the above perspectives stem from the point of view of a group or an overall discipline, it is interesting to compare them with the viewpoint of an individual researcher joining such a research group. Clearly, from the individual's point of view, it is optimal to join a group which maximises one's opportunity to interact, *i.e.* to join a large group. In other words, it is best for an individual to join a large group whereas it is best for the discipline as a whole to boost medium-sized groups (to make them large).

The above theory, which was placed on a mathematical footing by Kenna and Berche (2010), is the only agent-based, quantitative theory in the literature explaining the relationship between quality and quantity in research. The theory is scientific, in the sense that it is falsifiable (Popper, 1959): a hypothesis is proposed which can be tested empirically. Our hypothesis is that quantity drives quality through communication links. While other factors are undoubtedly also at work, in the spirit of Occam's razor,[1] this is the primary cause-and-effect mechanism. Our empirical testing is based on the statistical

analysis performed in Kenna and Berche (2011); this in turn supports the theoretical relationship between quality and quantity across a range of disciplines which have many different work methods. This universality also indicates a commonality of causal mechanism, largely independent of discipline. We have identified this causality as quantity-driving quality, which means that the theory is not only descriptive, but is also explanatory. To better understand the predictive nature of the theory, the causality arrow, and to draw specific policy and managerial conclusions for research at institutes of higher education, the theory needs to be confronted with empirical reality. National research quality assessments provide a suitable arena in which to do this. We address these in the following sections.

Research quality assessment in France and the United Kingdom

The United Kingdom's most recent RAE (2008) is considered to be the most precise evaluation of its kind to date. It was not based on citation counts, but on peer review. This is because bibliometric analyses are considered to measure **impact** rather that quality (Raan, 2005) and the one is not a proxy for the other, even for disciplines with good coverage in the Web of Science (Harnad, 2008, 2009; Mahdi *et al.*, 2008; Oppenheim and Summers, 2008; Raan, 2006; Evidence, 2009; and references therein). Another important principle underpinning the RAE is that it concerns the research quality of whole units or research groups that are put forward for assessment; it is not about individuals.

For the RAE, three aspects of group quality were considered: research outputs, research environment and research esteem. Research outputs mostly signify publications, but for some disciplines software, patents, artefacts, performances or exhibitions may be considered.

Arguments in favour of concentrating research resources go beyond the issue of quality of research outputs. For example, on the whole, larger groups and larger universities have access to more facilities and infrastructures, some of which may require a minimum level of usage to justify their purchase. The availability of expensive equipment and proximity of related groups which may share the cost burden facilitate the diversity of research direction. Such aspects of research environment were also measured at RAE and contributed to groups' final scores (RAE, 2008). Institutions were asked to provide information on research income and other funding supporting the group, on research infrastructure, the vitality of active seminar programmes, hosting workshops and conferences and on visiting researchers. Leadership of research, arrangements for supporting collaborative and interdisciplinary research, management, training and supervision of – and facilities for – postgraduate research students were also assessed. The appropriateness of accommodation and library facilities, for example, as well as hardware and software were also evaluated, as was the

quality of relationships with research users. Numbers of studentships and research-degree completion rates were considered. The RAE evaluators also considered the breadth of research activity within departments and the success of funded projects in generating additional grants and activities. The extent to which researchers – at all stages of their careers – were nurtured, arrangements for research leave, coherence and research culture were all scrutinised. Departments were required to provide clear evidence in support of all claims regarding the research environment.

Finally, visibility is also scale dependent. This was considered in the RAE through the "esteem" component. Esteem indicators included prizes, awards, fellowships, honours, major research grants, conference organisation, keynote addresses and editorial roles. Significant professional services, including to industry, were also assessed. Thus, through the environment and esteem components of RAE, efficiencies of scale and visibility were components which contributed to the overall measurements of group research quality.

The precise manner in which research outputs, research environment and research esteem fed into the overall final RAE score was dependent upon discipline. For example, in pure and applied mathematics, statistics and the computer sciences these three components were weighted at 70%, 20% and 10% respectively, while in biology, pre-clinical and human biological sciences, agriculture, veterinary and food sciences, outputs, environment and esteem were weighted at 75%, 20% and 5% respectively.

Experts in various research fields scrutinised these factors in research groups in order to determine the overall proportions of quality which fell into five levels. These levels are defined as 4* (research which is considered world-leading), 3* (internationally excellent), 2* (internationally recognised), 1* (nationally recognised) and unclassified. A formula based on the resulting quality profiles was then used to determine how research funding is distributed to each higher education institute which took part. Although Scotland used a more complicated funding formula, the one used by the funding councils for England, Wales and Northern Ireland associated each rank with a weight in such a way that 4* and 3* research received, respectively, seven and three times the amount of funding allocated to 2* research. Research ranked at, or below, 1* attracts no funding. This formula may therefore be used to give a continuous measure of the quality s of a research group. Denoting the percentage of research which was evaluated as n^* by p_{n^*} we define the quality of the group by $s = p_{4^*} + 3p_{3^*}/7 + p_{2^*}/7$. In this way, the maximum theoretical possible quality score is 100, corresponding to entirely 4* research. (In fact no group achieved this score, with the top groups achieving about half this.)

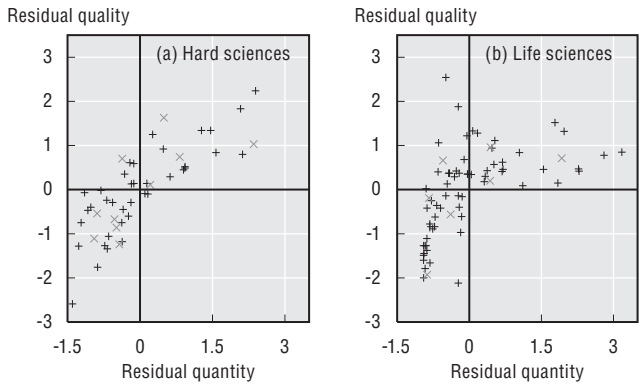
In the AERES evaluation system France is geographically divided into four parts, one part being evaluated each year. In the 2008 evaluation, a method was used which is considered more precise than that used in previous years and this facilitates comparison with the UK approach. However, since only 41 institutions were evaluated, of which 10 were traditional universities, the amount of data available for the French system is lower than for the UK equivalent. Furthermore, only a global mark is attributed to cumulated research groupings which can include several groups with heterogeneous levels. Consequently, the fine-grained analysis at the level of the research groups or departments is lost. This is clearly a weak point compared to the British system of evaluation and the AERES intends to change it in the near future. Nonetheless, in order to make the comparison with the British system, we translate the AERES grades A+, A, B, C into 4*, 3*, 2* and 1*.

It is useful to compare the French AERES system to the UK RAE for hard sciences and life sciences, although the French data refer to results on a broader institutional scale and fewer data are available. In the case of the hard sciences, we checked that the integrated UK data, obtained by merging pure and applied mathematics, statistics, physics, earth sciences, chemistry, computer science and informatics, yield results which overlap with their French counterparts. The comparison is properly made between the normalised residuals for the integrated quality and quantity measures. Quantity N is normalised to $(N - N_{av})/\sigma$, where N_{av} is the mean size and σ the corresponding standard deviation. A similar transformation normalises the quality residuals. In order to compare the life sciences, UK data for the biological sciences, pre-clinical and human biology have been integrated with agriculture, veterinary and food sciences. The resulting plots for the hard and life sciences are depicted in Figures 2(a) and 2(b) respectively. A convincing degree of overlap is evident for both plots, indicating compatibility between the British and French systems. Having established this, and having demonstrated the finer detail available in the British system, the next step is to analyse the latter at the detailed level of individual disciplines in order to investigate the model from a policy and managerial perspective. To do this, we first need to explain the British higher education research structure in more detail.

The United Kingdom's higher education research system

The UK's higher education academic research base is organised into a number of representation groups[2] (see, for example, Newman [2009] for an overview). The most famous of these is the Russell Group of research-intensive, leading universities, most of which have medical schools. It was established in 1994, two years after the Further and Higher Education Act, which conferred university status on former polytechnics, central institutions or colleges of

Figure 2. **Comparison of the French AERES system with the British RAE**



Note: Normalised quality residuals plotted against normalised quantity residuals for France's AERES and the UK's RAE for (a) the hard sciences and (b) the life sciences. The French data correspond to the symbols × and the integrated British data to +.

higher education. The Russell Group has 20 members and aims to help ensure that "resources are directed to where a critical mass of research can be undertaken to ensure the highest international standards with the greatest impact" (Russell Group, 2011). Russell Group universities are sometimes considered the UK equivalent to the US' Ivy League and its members receive approximately two-thirds of all research funding in the United Kingdom.

The 1994 Group represents 19 of the United Kingdom's top smaller research-intensive universities. It was founded in 1994 to defend the interests of its members following the establishment of the Russell Group by larger research-intensive universities earlier that same year. The Group "provides a central vehicle to help members promote their common interests in higher education, respond efficiently to key policy issues, and share best methods and practice. Each member undertakes diverse and high-quality research, while ensuring excellent levels of teaching and student experience" (1994 Group, 2011). Besides these, the remaining UK higher education institutes are represented by University Alliance, the Million+ Group and Guild HE, or are unaffiliated.

A recent bibliometric-based study has found that, league tables of university rankings notwithstanding (Salmi and Saroyan, 2007), there is little difference between the research quality of the Russell Group and the 1994 Group (Adams and Gurney, 2010). Confirmation of this observation undermines arguments that benefit continues to accrue through increase of scale. For if a continual policy of concentration of funding were indeed to lead to better quality research, one would expect that the research quality of the Russell Group of larger universities with their larger research groups, would be significantly superior to that of the 1994 Group, which typically contains smaller universities with smaller

groups. The main objective here is to explain this finding and draw policy conclusions from the mathematical model underlying this explanation. First, we examine the validity of the model.

Causality and caveats

Based on the model described by Kenna and Berche (2010, 2011), we maintain that the principle causal link between quality and quantity in group research is that the latter drives the former through communication channels. While the opposite causal arrow (quality driving quantity) is, no doubt, also an important factor, we believe that this is a secondary feedback mechanism and is not the dominant driver. Besides the support that the statistical analysis lends to the mathematical model (Kenna and Berche, 2011), evidence for this assertion comes from the existence of the breakpoint N_c and the Ringelmann effect (Ringelmann, 1913). The latter is a sociological phenomenon whereby productivity increases with size, but the gain reduces with each new member added to a group. The Ringelmann effect in this context is a co-ordination transition which occurs when the group size exceeds the upper critical mass of the average number of individuals with whom one can meaningfully communicate. Thus the Ringelmann effect here is a "breaking" mechanism, countering the otherwise linear rise of quality with quantity. If the causal arrow were in the opposite direction (quality driving quantity), there would be no communication-induced Ringelmann transition and no breakpoint N_c. In this case, quality would rise with quality until the maximum possible score $s = 100$ is reached. No group at RAE achieved this theoretical maximum.

On the other hand, one may argue that one advantage of scale is that it allows the support of early-stage researchers, whose output may be mediocre, within an environment of excellence. Indeed, this is important for nurturing and developing new talent. In this respect, it is unlikely that all members of a group are excellent and this could be another explanation for the Ringelmann phenomenon. However, at RAE, the "group" is defined by the submitting university. Since the stakes are high, and the quality-related post-evaluation income depends upon the quality profile attained at RAE, it is tactical for universities not to submit mediocre research. Typically, younger researchers (PhD students and postdoctoral researchers) contribute to the research environment element of RAE rather than directly to the research outputs or esteem aspects. This means that the groups submitted are actually smaller than the total number of research-active personnel in a given department and the group sizes discussed here refer to the number of established researchers.

With these caveats in mind, we proceed to offer an explanation for the similarity of research quality between large and smaller research-intensive universities, as reported by Adams and Gurney (2010).

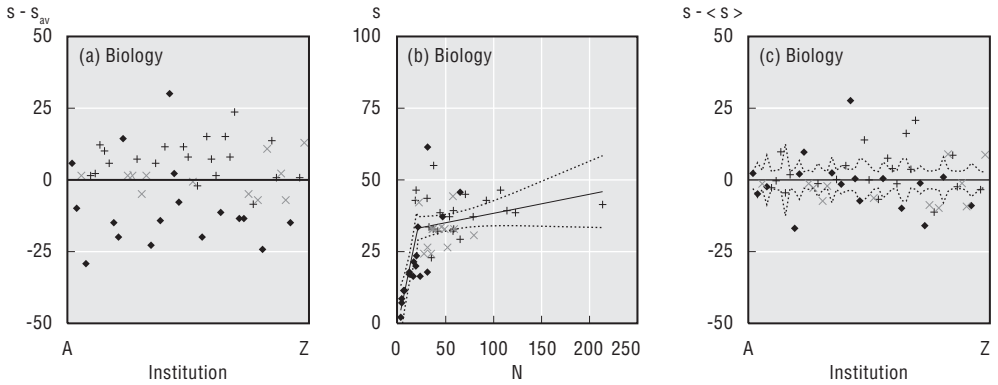
The dependency of research quality on quantity above and below the upper critical mass

This section provides an explanation for the similarity of research quality between the Russell and 1994 groups; it is useful to return to Figure 1(a), which relates to physics, as it offers two notable observations. The first is that the Russell (+) and 1994 (×) groups outperform the others (◆) in terms of their quality of research. One argument as to why this is the case is that benefit accrues through increasing scale and that increased concentration of resources leads to increased research strength. If this were the case, however, one would expect the Russell Group to outperform the 1994 Group. Indeed, the mean quantity of researchers in physics groups in a Russell Group university is $N_{av} = 63$. This is about twice the mean size for physics groups in the 1994 Group of universities, which have $N_{av} = 31$. However, the mean quality score for the Russell Group is $s_{av} = 40 \pm 5$ and that for the 1994 Group is $s_{av} = 39 \pm 8$. The proximity of the mean quality scores indicates that there is little difference, on average, between the two sets of universities, despite their differing sizes. This is consistent with the findings of Adams and Gurney (2010). This is the second observation associated with Figure 1(a) and it requires an explanation.

The explanation is found in Figure 1(b) where the same data are plotted against the size of the research groups. The solid line is the fit to the model (1) and the dashed curves represent the resulting 95% confidence intervals. The reason for the comparable qualities of the Russell Group and the 1994 Group and their superiority over other universities is clear now: although the average Russell Group research body is double the size of its equivalent in the 1994 Group, they both exceed $N_c \approx 25$ and therefore lie on the plateau where the concentration of more staff into these groups does not significantly increase overall average research quality. The physics groups of the other universities lie mainly to the left of the figure: these small and medium-sized groups have linear dependency of quality on quantity.

Similar analyses may be performed for other research areas. For example, the average size of biology research groups (Figure 3) in the Russell and 1994 groups are $N_{av} = 66$ and 44, respectively. Without the existence of the upper critical mass breakpoint, one would expect a proportionate superiority of the Russell Group over the 1994 Group in terms of quality. However, the corresponding mean quality scores are $s_{av} = 39 \pm 8$ and 32 ± 7, respectively. The reason for their proximity is that both sets of universities tend to have research groups in excess of the upper critical mass which is $N_c = 21 \pm 4$ for this discipline (Figure 3b). Similar to Figure 1 which relates to physics, the validity of the model is illustrated by the reduction of the standard deviation from 12.5 in Figure 3(a) to 8.5 in Figure 3(c).

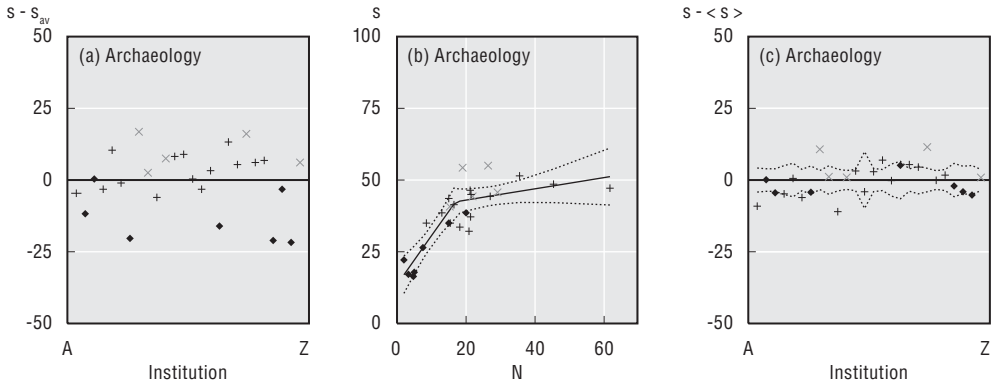
Figure 3. **Quality analysis for biology**



Note: Quality analysis for biology, analogous to Figure 1. The average size of research teams in the Russell and 1994 groups are N_{av} = 66 and 44, respectively, exceeding the upper critical mass which is N_c = 21 ± 4. The corresponding mean quality scores are similar at s_{av} = 39 ± 8 and 32 ± 7, respectively.

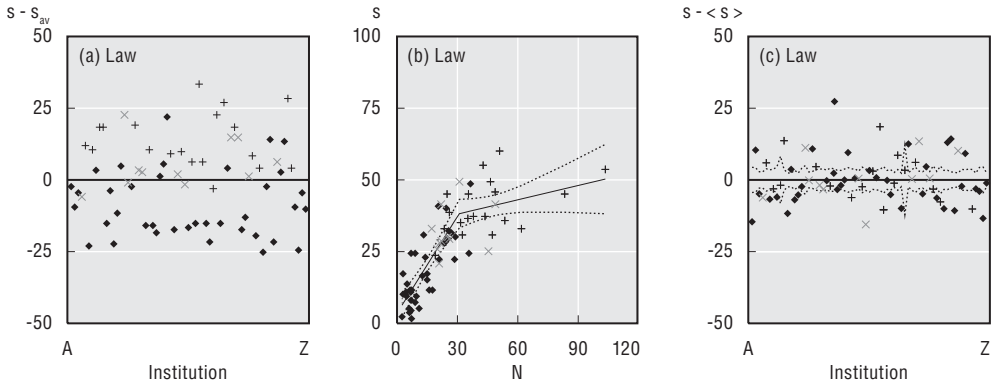
Figure 4 contains analogous plots for archaeology. The Russell and 1994 groups' archaeology teams mostly exceed the upper critical mass N_c = 17 ± 3. This explains the similarity in their average quality scores, which are s_{av} = 41 ± 7 and 48 ± 9, respectively. Figures 5-9 contain similar plots for law, education, applied mathematics and history, as well as architecture and town and country planning. In each case, the comparable levels of research quality associated with the large Russell and 1994 groups may be explained by the existence of the upper critical point and the reduction of the dependency of quality on quantity for $N > N_c$.

Figure 4. **Quality analysis for archaeology**



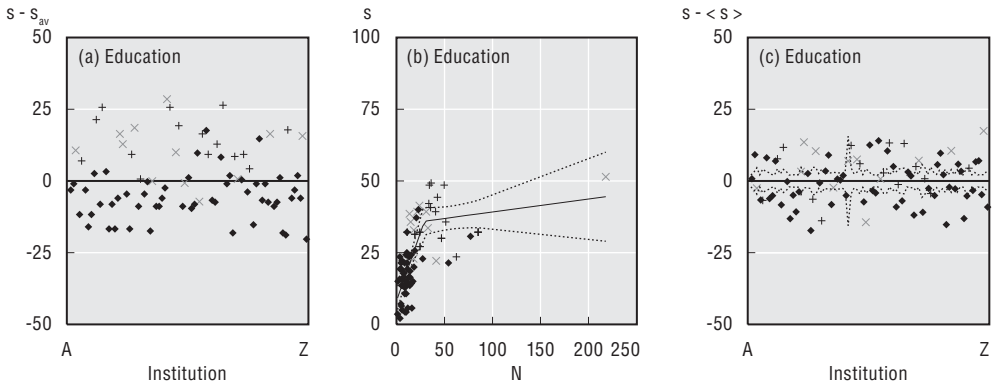
Note: Quality analysis for archaeology with upper critical mass N_c = 17 ± 3. The Russell and 1994 groups archaeology teams mostly exceed this value and their quality scores at s_{av} = 41 ± 7 and 48 ± 9 are hence comparable.

Figure 5. **Quality analysis for law**



Note: Quality analysis for law, analogous to Figure 1. The mean quality scores for the Russell and 1994 groups are s_{av} = 40 ± 10 and 32 ± 9, respectively. Their mean sizes N_{av} = 45 and 27 are at, or above, the upper critical mass N_c = 31 ± 4.

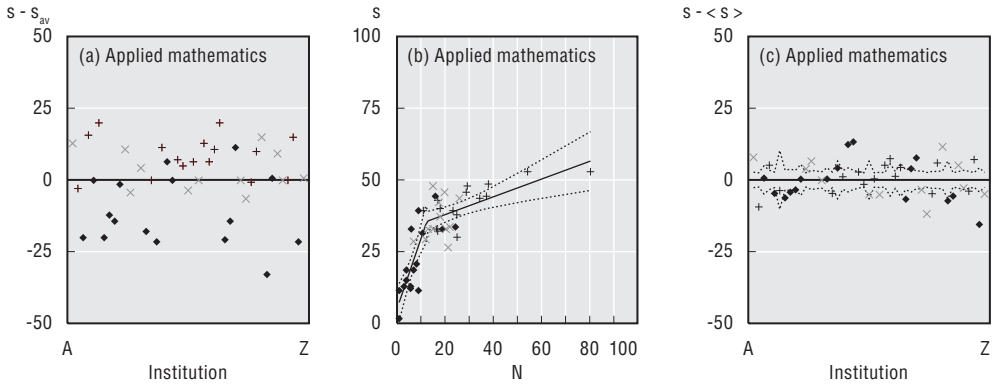
Figure 6. **Quality analysis for education**



Note: Quality analysis for education, analogous to Figure 1. The Russell and 1994 groups' research teams mostly exceed the upper critical mass N_c = 29 ± 5 for the discipline leading to comparable average quality scores are s_{av} = 37 ± 9 and 33 ± 11, respectively.

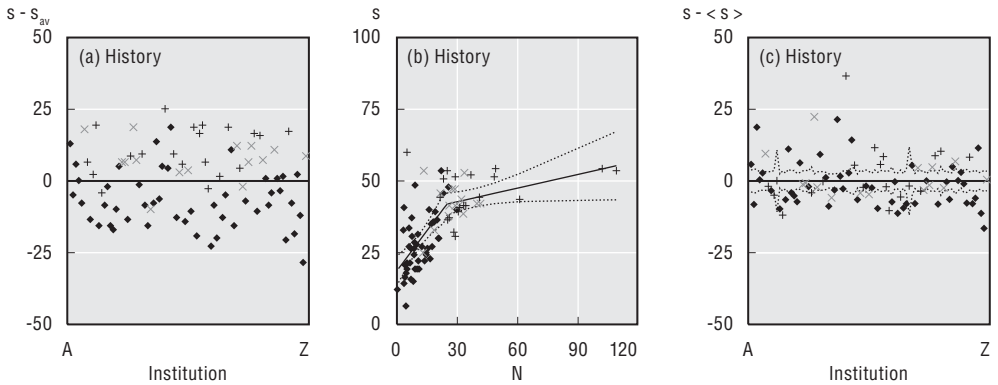
To summarise, the explanation for the superiority of the Russell Group and 1994 Group universities over the others lies in the different interaction patterns of their large groups compared to small and medium-sized groups. Individuals in large groups can interact with a maximal number of collaborators, while such interactions are limited in small and medium-sized groups. However, since one cannot sustain an indefinite number of interactions with ever-increasing numbers of colleagues, once the group grows larger than the upper critical mass, communication links are saturated and the addition of more researchers does not significantly increase research quality. Thus the

Figure 7. **Quality analysis for applied mathematics**



Note: Research quality analysis for applied mathematics. Again, although the Russell Group teams (whose mean size is $N_{av} = 30$) are on average twice as large as the 1994 Group teams ($N_{av} = 17$), their quality scores are similar, with $s_{av} = 41 \pm 8$ and $s_{av} = 36 \pm 8$ respectively. Again this is explained by the fact that these groups tend to exceed the upper critical mass, which is $N_c = 13 \pm 2$ for the discipline. Other research teams are mostly small or medium sized and therefore tend to have lower quality.

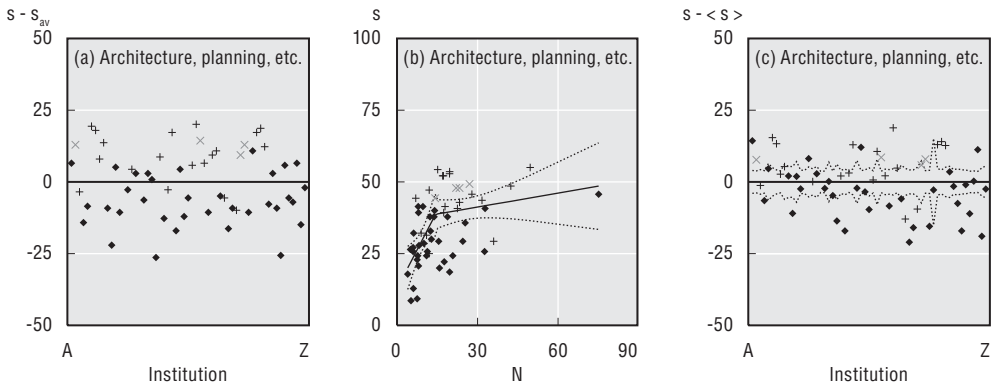
Figure 8. **Quality analysis for history**



Note: Quality analysis for history analogous to Figure 1. Again, the comparability of the average quality scores for the Russell ($s_{av} = 46 \pm 9$) and 1994 ($s_{av} = 42 \pm 8$) groups is attributable to them tending to have sufficiently large research groups: their average sizes $N_{av} = 39$ and 28 exceed the discipline's upper critical mass $N_c = 25 \pm 5$.

Russell and 1994 groups have comparable research standards. This explains Adams and Gurney's (2010) findings, as discussed in the Introduction. A policy supporting medium-sized groups to drive them towards the upper critical mass is therefore expected to enhance the quality of research in the sector overall.

Figure 9. **Quality analysis for architecture and town and country planning**



Note: Quality analysis for architecture and town and country planning analogous to Figure 1. The average team size for the Russell and 1994 groups are N_{av} = 21 and 22, respectively, in excess of the upper critical mass N_c = 14 ± 3. At s_{av} = 44 ± 10 and s_{av} = 47 ± 3, their mean qualities are also comparable.

Conclusions

The primary aim of this paper is to explain why the research quality of certain smaller universities may be on a par with that of larger, elite establishments. Evidence that this is indeed the case supports earlier observations of parity of research impact by Adams and Gurney (2010). An explanation for this phenomenon is important for policy and management in higher education and the explanation offered herein is based on a new understanding of the notion of critical mass in research. Kenna and Berche (2010, 2011) argue that the former notion of critical mass as a minimum, threshold number of researchers required for a stepwise increment in research quality is no longer valid. Instead, research quality tends to rise continuously with group quantity but only up to a limit termed the upper critical mass. This is interpreted as the average maximum number of colleagues with whom a given individual in a research group can meaningfully interact. Once the group exceeds this size, it tends to fragment into sub-groups and research quality no longer improves significantly if the size is increased. There is also a lower critical mass, which small research groups should strive to achieve for the sake of stability. The existence and properties of the upper critical mass explain why the research quality of the Russell Group of large research-intensive universities is not significantly better than that of the 1994 Group. Both tend to contain research groups which are large, in the sense that they are above the discipline-dependent upper critical masses in terms of size.

While the research quality of the Russell and 1994 groups are on a par, they are both significantly above that of other universities in the UK's higher education sector. This is because other institutes tend to have small- or medium-sized research groups. According to this analysis, the best way to amplify the strength of the sector is to support medium-sized groups to drive them towards the upper critical mass. This is the principle policy-orientated message of this paper.

The bulk of the analysis contained herein refers to the UK higher education sector, as its Research Assessment Exercise provides the most suitable data for analysis. However, by integrating the RAE data and comparing it to the equivalent French system, it is clear that the two are compatible. For this reason, it is expected that the lessons drawn may also have practical managerial and policy implications outside of the United Kingdom.

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Notes

1. Occam's razor is a principle attributed to the 14th century logician William of Ockham, according to which "entities should not be multiplied unnecessarily". It suggests that we should tend towards simpler theories until we can trade some simplicity for increased explanatory power.
2. We distinguish between research groups and representation groups: the former are the collectives of research staff included in the submission to the United Kingdom's RAE. These collectives are not always identical to administrative departments within universities, but they are assumed to be coherent groups of individuals for research-evaluation purposes. We refer to them in lower case (*e.g.* "physics group"). Representation groups, on the other hand, are formal collectives of universities as described here. We normally capitalise the latter (*e.g.* "Russell Group").

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The economics of teaching: what lies behind student-faculty ratios?

by
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The student-faculty ratio is of great significance to policy makers and media as a popular measure of education and teaching quality. Due to its simplicity and the availability of data, it is often used in higher education policy for allocating resources and for ranking universities. This is especially so in some European countries which do not have selective admission policies and where universities have to cope with huge numbers of students. However, there is no definition and no empirically validated data for an appropriate student-faculty ratio. To close this gap, we constructed a model with parameters relevant for high quality teaching and education and validated them empirically by conducting a survey among university professors in business administration. The results clearly illustrate that student-faculty ratios are discipline specific and depend whether the university is research or teaching oriented.

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Les aspects économiques de l'enseignement : la face cachée du ratio étudiants-professeurs

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Le ratio étudiants-professeurs est très important pour les décideurs et les médias en tant que mesure prisée de l'éducation et de la qualité de l'enseignement. En raison de sa simplicité et de la disponibilité des données, il est souvent utilisé dans la politique de l'enseignement supérieur pour l'allocation des ressources et le classement des universités. C'est en particulier le cas dans certains pays européens qui n'ont pas de politiques d'admission sélective et où les universités doivent faire face à un très grand nombre d'étudiants. Cependant, il n'existe pas de définition ni de données validées de façon empirique qui correspondent à un ratio étudiants-professeurs approprié. Afin de combler cette lacune, nous avons mis au point un modèle avec des paramètres pertinents pour l'enseignement de haute qualité et l'éducation que nous avons validé empiriquement par une enquête auprès de professeurs d'université en administration des affaires. Les résultats montrent clairement que les ratios étudiants-professeurs varient selon les disciplines et dépendent de l'orientation de l'université vers la recherche ou l'enseignement.

Introduction and research question

The student-faculty ratio – defined as the number of students compared to the number of full professors – is becoming increasingly important to higher education policy. It is often argued that a high student-faculty ratio is synonymous with a weak interaction between students and faculty, low teaching quality and is not suited for teaching more complex subjects (Card and Krueger, 1996). Indeed, students' needs are not catered for as much as they should be; neither are they involved in faculty research projects. Faculty itself only has a small amount of time to conduct proper research and is obliged to invest most of it in teaching and grading activities. This situation is unsatisfactory, not only for faculty members but also for students. In order to remedy it, policy makers in several European countries have decided to invest additional money in university units with particularly high student-faculty ratios. One of these countries is Switzerland, where the policy makers concerned (the Swiss University Conference) decided, first in 2002 and then again in 2006, to allocate additional funds to such departments.

Due to its simplicity and the availability of data, the student-faculty ratio is used by ministries and university boards when allocating funds, but it also plays an important role in media rankings such as those provided by the German news magazines *Der Spiegel* or *Focus*, where student-faculty ratios have become indicators of teaching quality (NZZ, 2006). The message to the public is very simple: the lower the student-faculty ratio, the more attention professors are able to give to their students; conversely, the higher the student-faculty ratio, the less time professors spend with their students. A low ratio results in a good position in media rankings and is considered a prerequisite for high quality education.

In Europe, most universities are publicly financed and cannot select their students; they are therefore obliged to admit all those who have passed upper secondary school exit exams. This often results in inadequate student-faculty ratios in the first year (before student assessment) especially in psychology, sociology and media science, but also in business administration and law. The problems resulting from an inadequate student-faculty ratio have been discussed in the literature and the question of a reasonable benchmark has been raised at political level (Troutt, 1979). Before spending too much public money, policy makers wanted to know how a "good or appropriate" student-faculty ratio could be defined and what could constitute a reasonable

benchmark for the different disciplines. In 1986, Gollnick and Kunkel reported that new standards for the accreditation of US teacher education specified minimum student-faculty ratios.

No empirically validated study to define an appropriate student-faculty ratio at tertiary level has been conducted until now. Most of the existing studies were carried out on primary and secondary levels and their results cannot be applied directly to university students. However, studies at the primary and secondary levels show ambiguous results stemming from class size reduction and the benefit is heavily contested by economists, researchers and educators. On the one hand, researchers such as Finn and Achilles (1990), Rice (1999), Hoxby (2000), Rockoff (2009) and Graue *et al.* (2009) point to positive effects; on the other hand, Glass and Smith (1979), Hanushek (1999) and Voss (2004) find no clear links between class size and achievement. Konstantopoulos and Chung (2009) conducted an in-depth longitudinal survey showing that when students in elementary schools are in higher grades, they still benefit from having been in small classes in lower grades. In addition, they found that the small-class effect had a similar positive impact on low, medium and high achievers and that small class sizes in elementary schools reduce the gap between low- and high-achieving students in reading and science. Similar results are described by McKee *et al.* (2010). However, the literature on education and learning provides no indication that class size reductions result in overall improvement in student achievement.

Therefore, no empirical study has been conducted at university level and there is no evidence that a specific class size or student-faculty ratio would be appropriate to guarantee high quality education for university students. Neither is there a theoretical model which can be used to determine the most important parameters influencing the student-faculty ratio. All that we could find on the subject were guidelines produced by rector conferences, scientific councils or quality assurance agencies. For example, the Rectors' Conference of the Swiss Universities (CRUS) issued a strategy paper for 2005-15 calling for a student-faculty ratio of 40:1 in humanities and social sciences and a ratio of 35:1 in technical sciences at master's level (Schenker-Wicki and Hürlimann, 2005), as well as a ratio of 60:1 at bachelor's level for all disciplines.

In order to close this information gap, we developed a theoretical model that identifies the most important parameters influencing the student-faculty ratio. We subsequently validated these parameters empirically by conducting an extensive written survey among university professors – as the most relevant peer group – teaching business administration at universities in Germany, Austria and Switzerland. The data from the survey were then integrated into the model; student-faculty ratios that professors perceive to be "good or appropriate" were then calculated and examined.

During the course of the discussion below, the following research questions are addressed:

i) What lies behind the student-faculty ratio and what are the most important parameters that influence this ratio? How can the differences between various disciplines and the additional teaching load resulting from the Bologna Process reforms be taken into account?

ii) In order to guarantee interaction and high-quality teaching by faculty members, what is a "good or appropriate" class size in relation to different forms of teaching? What is the resulting student-faculty ratio?

iii) Do high student-faculty ratios reflect poor-quality teaching and low ratios reflect high-quality teaching?

iv) Can we determine an "appropriate" student-faculty ratio for each discipline, or do we have a range of "appropriate" ratios for each discipline?

This paper responds to these questions as follows. First, to understand which parameters fundamentally influence teaching, we developed a simple demand and supply model. This describes students' demand for teaching and professors' supply of teaching and is analogous to the capacity model for determining curricular norm values for capacity calculations at German universities. Second, we explain how we gathered the empirical data which fed the model. This process encompasses the evaluation of standard degree programmes in business administration in Germany and Switzerland (at bachelor's [BA] and master's [MA] level), as well as an Internet-based survey of university professors in the German-speaking part of Europe. We go on to present and discuss the results of the survey and end with conclusions. Hence, the advantages, limits and practicability of the survey findings are explored throughout the paper.

Methods and data

Calculating supply and demand

Demand

Because there is no tool with which to measure teaching quality, other parameters have to be used as proxies. In order to calculate demand, the following assumptions have been made (Brenner, 2004):

- Demand is calculated in function of a student's need for various forms of teaching and based on weekly two-hour courses – concluding with an exam or written assignment – over a year. A weekly two-hour course was chosen because it is the basic unit – or module – used in most study programmes at European universities.

- The various forms of teaching in social sciences – especially in business administration – consist of **lectures, learning laboratories and seminars**. These modes of teaching require different interactions and should be calculated differently.
- In order to provide high-quality education and teaching, class sizes have to be appropriate to the various forms of teaching. Only **appropriate class sizes** allow the necessary interactions and supervision to guarantee high quality teaching. This consideration is based on the assumption that various forms of teaching need different student-faculty ratios in order to be effective: while a ratio of 1:50 is acceptable for a basic lecture in a bachelor's programme, it is inadequate for a chemistry laboratory course, for example.

Subsequent to the Bologna Process reforms (Bologna Process, 2007-11; Europeunit, 2011), there are now additional **exams** and **papers** which need to be corrected and this should be considered separately in relation to the demand model.

The yearly demand for teaching by a student who is supervised "in an appropriate way" by the faculty is calculated as follows:

$$D = \left[\frac{(B_V + P)V}{K_{opt.V}} + \frac{(B_U + P)U}{K_{opt.U}} + \frac{(B_S + P)S}{K_{opt.S}}\right] + \left[K_V V + K_U U + K_S S)\right] + H \qquad \text{Equation 1}$$

Variables are:

D: Total demand for teaching, in hours, per year and per student.

V: Number of 2-hour lecture units per year.

U: Number of 2-hour learning laboratory units per year.

S: Number of 2-hour seminar units per year.

B_V, B_U, B_S: Preparation time, in hours, for a 2-hour lecture unit (B_V), learning laboratory unit (B_U) and seminar unit (B_S) by faculty.

P: Duration of attendance, in hours, by faculty.

K_V, K_U, K_S: Time for support and corrections, in hours, for lectures, learning laboratories and seminars, respectively.

$K_{opt.V}$: Number of students that can optimally attend a lecture.

$K_{opt.U}$: Number of students that can be optimally supervised in a learning laboratory.

$K_{opt.S}$: Number of students that can be optimally supervised at a seminar.

H: Time needed for supervising and correcting a bachelor's or master's thesis, in hours.

The first term is relatively stable and changes little when the number of students increases. However, the second term shows a notable change when there is a greater number of students.

Supply

The supply of teaching is calculated according to the amount of time that a faculty member devotes to teaching over a year. It is assumed that faculty only use part of their working time for teaching; the remainder is spent on research and administration. Further, it is implicitly assumed that faculty possesses the necessary academic and didactic qualifications to deliver teaching to adequate standards. Therefore, it is of little importance whether education is provided by a full professor or by an "academically qualified" assistant or senior assistant. This view corresponds to a modern understanding of faculty, whereby not only full professors (senior faculty) but also qualified assistants (junior faculty) are responsible for the education of students. The yearly supply of teaching in hours per faculty member is calculated as shown in Equation 2. This simplified supply model, however, does not differentiate between the academic staff member's seniority, duties and appointment type, which is of considerable importance, for instance, in wealthy English-speaking countries.

$$S = A * X * W \qquad \text{Equation 2}$$

Variables are:

S: Supply of teaching, in hours, per year and per faculty member.

A: Working time per week, in hours.

X: Percentage of working time used for teaching activities.

W: Number of working weeks in a year.

Empirical data

To evaluate the **demand** for teaching, standard degree programmes in business administration (at bachelor's and master's level) of four universities in Germany and Switzerland were analysed. In addition, a survey of faculty members was conducted in co-operation with the German Academic Association for Business Research. In the survey, professors had to specify different forms of teaching, estimate the amount of time spent on course preparation, supervision and examinations and determine the "appropriate class sizes".

Lectures, learning laboratories and seminars in standard degree programmes for business administration

According to Equation 1, the number of 2-hour lecture units per year (*V*), the number of 2-hour learning laboratory units (*U*) per year and the number of 2-hour

seminar-units (*S*) per year were calculated based on the curricula of standard degree programmes in business administration (general management) at bachelor's and master's level at two faculties in Switzerland (the universities of Berne and Zurich) and two in Germany (Ludwig-Maximilian-University in Munich and Humboldt University in Berlin). These faculties were chosen for the following reasons: the University of Zurich has one of the largest business economics departments in the country and the University of Berne is a typical mid-sized university. Both departments were among the first in Switzerland to have implemented the Bologna reforms. Furthermore, the University of Zurich's Department of Economics, Business Administration and Information Technology was ranked the best German-speaking department in the Social Science Research Networks (SSRN) ranking in 2010. The Ludwig-Maximilian University and the Humboldt University are among the largest and most renowned universities in Germany.

Written survey

A written survey was conducted among 1 265 university professors in the German-speaking parts of Switzerland, Germany and Austria; all were registered members of the German Academic Association for Business Research. The survey was used to evaluate the following parameters of Equation 1:

B_V, B_U, B_S: Preparation time, in hours, for a 2-hour lecture unit (B_v), learning laboratory unit (B_U) and seminar unit (B_s), by faculty.

K_V, K_U, K_S: Support and correction time, in hours, for lectures, learning laboratories and seminars, respectively.

$K_{opt.V}$: Number of students who should attend a lecture, allowing for appropriate interaction and high-quality teaching.

$K_{opt.U}$: Number of students who can be supervised in an appropriate way in a learning laboratory, allowing for high-quality teaching.

$K_{opt.S}$: Number of students who can be supervised in an appropriate way in a seminar, allowing for high-quality teaching.

H: Time needed for supervising and correcting a bachelor's or master's thesis, in hours.

The survey was carried out by means of an Internet-based questionnaire. On 6 December 2007, all 1 265 professors were invited to fill out an online survey. They were asked how many students would be appropriate for different forms of teaching in a bachelor's or master's programme to ensure high-quality education and teaching.

The rate of return was only 9.4%, which unfortunately limits the representativeness of the responses. Nevertheless, an analysis of respondents'

profiles shows that 98% of the respondents taught at a traditional research university and 2% taught at a university of applied science (*Fachhochschule*); 93% of them were male. Respondents were, on average, 51 years old and had been teaching for 13 years. Female professors are – in general – still under-represented in the field of business research and this was also reflected in our survey as 86% of the respondents were male. In light of these figures, our results should be interpreted carefully.

Results

Lectures, learning laboratories and seminars in standard degree programmes in business administration

It is useful to take a look at the course schedule of a standard bachelor's and master's full-time degree programme. The University of Zurich, by way of example, structures its bachelor's programme in business administration as follows: a one-year assessment programme is worth 60 European Credit Transfer System (ECTS) points and a two-year basic programme is worth 120 ECTS points, making a total of 180 points. The standard bachelor's programme in business administration at the University of Zurich lasts three years. At master's level a further 120 points have to be earned; this programme can be completed over two years of full-time study.

Table 1 shows the distribution of ECTS points for the different forms of teaching for all four universities. It serves as a basis to calculate the amount of teaching that is required per student during his/her bachelor's or master's studies.

Table 1. **The number of ECTS points in the curriculum of a standard bachelor's or master's degree programme in business administration at various universities**

Forms of teaching	Zurich		Berne		Munich		Berlin	
	BA	MA	BA	MA	BA	MA	BA	MA
Lectures	107	60	116.5	51	132	72	102	60
Learning labs	46	18	31.5	15	33	18	63	18
Seminars	9	12	22	4	3	0	3	12
Thesis	18	30	10	20	12	30	12	30
Total ECTS	**180**	**120**	**180**	**90**	**180**	**120**	**180**	**120**

Our calculations are based on the assumption that a student only participates in courses offered by the department itself and that he/she earns 60 credit points per year (*i.e.* is a full-time student). Furthermore, we are assuming that a semester has 14 weeks and that credits are awarded only for courses which terminate with an exam.

To obtain the data for the model presented above (*i.e.* Equation 1) such as the number of 2-hour lecture units per year, the number of 2-hour learning laboratory units per year and the number of 2-hour seminar units per year, the number of credit points has to be converted into a number of 2-hour classes per year. In all of the universities that were analysed, a 2-hour class is equivalent to 3 ECTS points.

All the bachelor's programmes require 180 credit points over six semesters in order to get a degree. For the master's programme, there are two categories: Berne allocates 90 credits over 3 semesters; Zurich, Berlin and Munich allocate 120 credits over 4 semesters. The average values have been calculated in Table 2 accordingly.

Table 2. **Average demand for different forms of teaching, measured as the number of 2-hour classes per year and per student**

Forms of teaching	BA	MA
Number of 2-hour lectures per year (V)	12.7	10.8
Number of 2-hour learning labs per year (U)	4.8	3.1
Number of 2-hour seminars per year (S)	1	1.2

Appropriate class sizes

In response to the question what is the maximum number of students that can attend a lecture, a learning laboratory or a seminar without compromising high-quality teaching, the survey respondents answered as follows (Table 3):

Table 3. **Maximum number of students enrolled in a single course**

Forms of teaching	Maximum number of students	
	BA	MA
Lectures ($K_{opt.V}$)	94 (79)	57 (50)
Learning labs ($K_{opt.U}$)	30 (17)	26 (14)
Seminars ($K_{opt.S}$)	22 (7)	19 (7)

Note: Average values, standard deviations in parentheses.

The high standard deviation values presented in Table 3 show that the answers are very heterogeneous. It is possible that the figures are distorted because of an adaptation effect: "you like what you get" (March, 1994). Aside from lectures with hundreds of students, which are not deemed appropriate, professors of business administration are able to adjust to various numbers of students in their classes. The high standard deviations are consistent with an earlier survey conducted at the University of Zurich and the Swiss Federal

Institute of Technology (ETH) in 2006, in which professors were asked about target capacities in the fields of economics, business administration, psychology and civil engineering (Cadario, 2006). Similar to the 2006 study, the respondents in our survey called for much smaller student-faculty ratios in the field of economics (BA: –35%, MA: –40%). Therefore, there are different ideal student-faculty ratios according to different fields of education such as economics, finance or accounting.

Professors' preparation time for classes

Given that individual preparation times can vary for different forms of teaching, each professor was asked about his/her preparation time. This relates to a 2-hour class, and excludes the time required to develop new courses (Table 4).

Table 4. **Preparation time for a 2-hour class**

Forms of teaching	Preparation time for a 2-hour class	
	BA	MA
Lecture (B_V)	5 (5)	6 (9)
Learning Lab (B_U)	5 (5)	5 (6)
Seminar (B_S)	6 (5)	6 (9)

Note: Average values, standard deviations in parentheses.

These data also demonstrate a large degree of heterogeneity, which is reflected in the high standard deviations. The values from the empirical survey are, however, clearly higher than those used for the capacity calculations at German universities, whereby it is assumed that two hours are needed for preparation and follow-up of a two-hour lecture or a seminar and one hour for learning laboratories (Seeliger, 2005).

Correction time

Because of the modularisation of degree programmes following the Bologna reforms, professors' workloads have increased substantially. This is essentially due to work generated by additional exams and teaching duties, as well as more support activities (Academics, 2010). In order to integrate this additional workload into the model, examination correction time was included. It is estimated that one hour of correction time is systematically spent per student and tested course. This time includes the correction of exams, exercises and homework and is correlated by Handel *et al.* (2005).

One of the questions in the written survey asked how much time was required for supervising and correcting bachelor's and master's theses. The average amount of time spent on these activities is illustrated in Table 5, as

well as the average time span for writing a bachelor's or master's thesis as defined in the university's regulations.

Table 5. **Time for supervision and correction**

Forms of teaching	Time for supervision and correction, in hours	Maximum processing time, in months
Bachelor thesis (H_B)	12 (7)	4 (3)
Master thesis (H_M)	17 (10)	5 (4)

Note: Average values, standard deviations in parentheses.

Supply

Equation 2 enables us to calculate the working hours that can be supplied for teaching, as follows (these figures are based on Swiss norms, which are similar to German and Austrian norms):

- 48 weeks of work per year (4 weeks of vacation): $W = 48$.
- With 42 hours in a week: $A = 42$.
- Of this time, around 55.5%* is used for teaching (BFS/SHIS, 2008): $X = 0.555$.

According to Equation 2 we can calculate the supply of teaching per year and faculty member (S). Hence, the supply of teaching for an academically qualified faculty member at a Swiss university in business administration is about 1 119 hours per year.

Calculating global demand for teaching per student and per year for a bachelor's and master's programme in business administration

The model presented above (Equation 1) is complemented by the empirical data in Tables 1 to 5. Although the standard deviations are very high, the average values were used for the calculations. These deviations can be attributed primarily to the fact that professors disagreed over the appropriate class sizes for the different forms of teaching, but also to the fact that they are highly individualistic, as they reported very heterogeneous preparation, supervision and correction times.

In Tables 6 and 7, the empirical data relating to bachelor's and master's degree programmes are applied to our theoretical model, which enables us to calculate the demand for teaching in both cases.

* This figure originates from a survey of Swiss universities on cost accounting and relates to business administration. Calculations are based on professors' and other faculty members' average teaching time.

Table 6. **Demand for teaching per student and per year for a bachelor's programme in business economics**

	Number of 2-hour classes per year[1] (V, U, S)	Optimal group size ($K_{opt.V}$, $K_{opt.U}$, $K_{opt.S}$)	Preparation, in hours, per class (B_V, B_U, B_S)	Attendance, in hours, per 2-hour class unit (P)	Correcting exams, in hours (K_V, K_U, K_S)	Supervising and correcting, in hours (H)	Total hours for an optimal cohort	Demand per year and per student (D)
Lectures	12.7	94	5	2	1		1 338.6	14.2[2]
Learning labs	4.8	30	5	2	1		500.4	16.7
Seminars	1	22	6	2	1		134	6.1
BA thesis						12		4[3]
Total hours per year and student								**41.0**

1. Supplied over 14 weeks.
2. The total number of hours, based on an appropriate class size, are calculated as follows: $(12.7 \times 14 \times (5 + 2) + (94 \times 1))/94$.
3. The total of 12 hours for the supervision and correction of bachelor theses should only be taken partially into account because a bachelor's study programme (full-time) takes 3 years. Hence, 4 hours are added to the total demand per year.

Table 7. **Demand for teaching per student and per year for a master's programme in business economics**

	Number of 2-hour classes per year[1] (V, U, S)	Optimal group size ($K_{opt.V}$, $K_{opt.U}$, $K_{opt.S}$)	Preparation, in hours, per class (B_V, B_U, B_S)	Attendance time, in hours, per 2-hour class unit (P)	Correcting exams, in hours (K_V, K_U, K_S)	Supervision and correcting, in hours (H)	Total hours for an optimal cohort	Demand per year and per student (D)
Lectures	10.8	57	6	2	1		1 266	22.2[2]
Learning labs	3.1	26	5	2	1		329.8	12.7
Seminars	1.2	19	6	2	1		153.4	8.1
MA thesis						17		9.1[3]
Total hours per year and student								**52.0**

1. Supplied over 14 weeks.
2. The total number of hours, based on an appropriate class size, are calculated as follows: $(12.7 \times 14 \times (5 + 2) + (94 \times 1))/94$.
3. The total of 12 hours for the supervision and correction of bachelor theses should only be taken partially into account because a bachelor's study programme (full-time) takes 3 years. Hence, 4 hours are added to the total demand per year.

Calculating an appropriate student-faculty ratio for bachelor's and master's programmes in business administration

Based on the global demand for teaching per student (Tables 6 and 7), an appropriate student-faculty ratio can be determined in function of the supply of teaching activities; Table 8 simulates three different cases. The first one

Table 8. **Appropriate student-faculty ratios for high-quality teaching in different kinds of faculties**

	Student-faculty ratio for a bachelor's study programme	Student-faculty ratio for a master's study programme
Swiss universities (which devote 55.5% of working time to teaching)	27:1	22:1
Teaching-focused faculty which devotes 90% of working time to teaching	44:1	35:1
Research-focused faculty which devotes 15% of working time to teaching	7:1	6:1

features Swiss universities: they devote an average of 55.5% of working time to teaching activities (as defined above) and serve to calculate the student-faculty ratio that would be appropriate to guarantee high-quality teaching. The second case presents a sample teaching-oriented faculty where 90% (upper limit) of working time is spent on teaching activities. The third case presents another research-focused faculty where only 15% (lower limit) of working time is spent on teaching. Table 8 illustrates how one faculty member is needed to educate between 7 and 44 bachelor students and between 6 and 35 master students, depending on the focus. Therefore, the student-faculty ratio can vary by a factor of six for the same teaching quality.

Discussion

The theoretical model

The model for identifying the student-faculty ratio presented here is a simple linear one with compensation effects. Although compensations between specific components can arise and differences can be reduced, for the time being the basis for calculating more complex dynamic interactions is lacking, so this could be a topic for further research. The advantage of our model is that it can be easily understood. Furthermore, the specific features of various disciplines can be taken into account very simply due to the integration of different forms of teaching. Depending on the discipline, other types of teaching, such as bedside teaching for medicine, can be analysed and the corresponding "appropriate class sizes" which guarantee high-quality education and teaching can be estimated.

Data

In relation to demand, the empirical data collected in this study and used in the calculations should be treated with caution. We believe that the data are not representative and that the survey questions were too loosely formulated, hence leading to significant divergences. The survey would therefore have to be repeated before its results could be used for higher education policy.

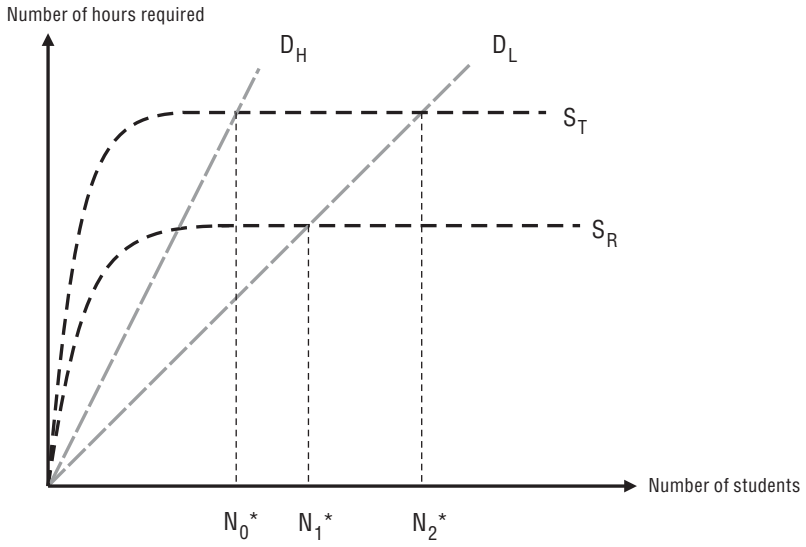
However, an analysis of the curricula for standard degree programmes offered by different universities points to the fact that these are very similar. This result can doubtlessly be attributed to the intensive pan-European discussion linked to the Bologna reforms.

In relation to supply, we respected Swiss legal norms and used data from a survey conducted by the Swiss Federal Statistical Office (BFS/SHIS, 2010). It is obvious that other norms found in different cultural contexts will directly influence the amount of time a faculty member has available and, consequently, the student-faculty ratio.

Appropriate student-faculty ratios for high-quality teaching

Our analyses, which are based on empirical data, have shown that an appropriate student-faculty ratio for a business administration programme can differ widely, depending on the focus of the faculty. This can also be illustrated graphically: the **supply curve S** is a classical production function which asymptotically approaches a threshold value, representing the maximum amount of working time available for teaching (Figure 1). Two faculties are represented here: a research-focused faculty (S_R) and a teaching-focused faculty (S_T). **The demand curve D** depicts the amount of demand for teaching in hours; it also increases proportionally with the number of students.

Figure 1. **Supply curves with respect to teaching activities**



Variations affecting supply: In the case of demand, represented as D_L, a research-oriented faculty S_R reaches a lower equilibrium number of students N_1^* than a teaching-oriented institution S_T with N_2^*. A lower equilibrium is equivalent to a lower student-faculty ratio and a higher equilibrium corresponds to a higher student-faculty ratio, whereas each of the different equilibriums represents high-quality teaching.

In European universities demand generally exceeds supply, so different strategies need to be developed to guarantee the necessary amount of teaching. This can be achieved by hiring more faculty members or by increasing the existing staff's teaching time. Due to budget restrictions – especially after the financial crisis – the first strategy is difficult to implement, whereas the second strategy is most common. Unfortunately this diminishes the amount of time faculty can devote to research, which penalises not only faculty members' scientific work and reputation but also modern societies, for which research is one of the most important competitive factors.

Variations affecting demand: Just like the supply curve, the demand curve can also vary according to different forms of teaching. For instance, the demand curve can be shifted to the right by introducing e-learning, by increasing the amount of home and group work or by avoiding teaching forms that are very staff intensive, such as seminars or learning laboratories. A curriculum that imposes a large amount of teaching activities on faculty members (in the form of multiple seminaries and learning laboratories) is illustrated in Figure 1 as D_H and results in the equilibrium N_0^* for teaching-oriented faculty with a supply S_T. In contrast, D_L calls for fewer teaching activities and the equilibrium N_2^* lies to the right, which means that a higher number of students can be educated.

Appropriate student-faculty ratios and amount of faculty staff

In general, the supply of teaching does not just include professors; it also relates to the efforts provided by all academically qualified faculty members. Consequently, the results given in Tables 6 to 8 cannot be applied to the classic student-faculty ratio often used in European higher education policy, where only full professors are taken into account. To obtain a more realistic picture, all academically qualified faculty members would need to be considered. This includes all categories of professors (full professors, associate professors, assistant professors) and senior research assistants. (In order to be academically qualified, faculty members are expected to hold a PhD and to have published work.) If this new criteria had been applied to the Faculty of Economics, Business Administration and Information Technology at the University of Zurich in the spring of 2009, the difference would have been substantial: results based on full professors alone would have given a student-faculty ratio of 1:69, whereas if all academically qualified members had been included, this would have given a student-faculty ratio of 1:24. A ratio based

solely on a portion of students and full professors does not represent the complex reality of a university, nor does it appropriately reflect its education and teaching quality. In fact, it ignores the enormous contribution made by mid-level faculty members, without which European universities could not exist.

As can be seen in Table 8, high-quality teaching is not guaranteed by a sole student-faculty ratio, since appropriate ratios depend largely on faculty strategies. A teaching-oriented faculty dedicates more hours to teaching than a research-oriented faculty. Consequently, a teaching-oriented faculty is able to educate more students than a research-oriented one. If we take the equilibriums in Figure 1 as being the intersections where demand exactly matches the necessary supply for high-quality teaching, we do not find a single appropriate student-faculty ratio but a range of appropriate ones. According to our calculations in Table 8, the factor varies six-fold. A student-faculty ratio of 7:1 is congruent with those found at the most famous American universities, where such ratios of that magnitude are common (Schenker-Wicki and Hürlimann, 2005; *US News and World Report*, 2010). This means that these famous universities are strongly research oriented and invest only about 15% of their time in teaching.

Summary

The classic student-faculty ratio, which is defined as the number of students compared to the number of full professors, has various deficiencies when used as an indicator of education and teaching quality. But although most media rankings of universities and higher education policies rely on it, to our surprise no empirically validated study of it has been conducted so far. To close this research gap and to reduce its known shortcomings, we developed a theoretical model based on capacity calculations. Our model takes into account different forms of teaching, as well as an increasing workload linked to exams resulting from the Bologna reforms. It enables the demand for teaching by students and the supply of teaching by faculty to be calculated. The model is quite simple, easily understandable and can be applied to other academic disciplines by considering the forms of teaching relevant to them. All of the parameters used in the model were gathered empirically. The data used to calculate supply were based on Swiss standards and provided by the Swiss Federal Statistical Office, whereas the data used to calculate demand were determined by analysing the curricula of standard degree programmes in business administration at German and Swiss universities. We also conducted a survey among the members of the German Academic Association for Business Research which entailed assessing appropriate cohorts involved in each form of teaching such as lectures, learning laboratories and seminars.

The model and the corresponding calculations show that an appropriate student-faculty ratio can vary by a factor of six for the same amount of teaching time spent per student and per year. A lower student-faculty ratio does not automatically imply better education; rather, it suggests that the institutions in question are more active in research. They will only profit from a low student-faculty ratio if their students are directly involved in research (research-oriented teaching). This finding corresponds to that of Voss (2004), who notes that a lower student-faculty ratio does not necessarily result in higher quality education.

A comparison of student-faculty ratios can be misleading. This is mainly because the term "faculty" is defined in different ways. Faculty in Europe means full and associate professors, whereas faculty in the United States includes all academically qualified staff, *i.e.* the so-called "participating faculty". Therefore, if a European student-faculty ratio is directly compared to US ratios, the European values are distinctly unfavourable.

We conclude that there is no single best student-faculty ratio for all academic disciplines and for all types of universities. Each discipline has its specific standard curriculum and educates its students using different forms of teaching, each of which is more or less time intensive. This leads to a certain demand for teaching hours per year and per student, which needs to be matched to the amount of teaching that a faculty is able to supply. Hence, for each academic discipline and for at least two types of universities – research-focused and teaching-focused – different ratios will be needed to guarantee high-quality education and teaching. Therefore, if student-faculty ratios are to be used for education policy and for the allocation of financial resources in particular, they have to be carefully analysed and revised in function of the faculty's discipline and specific focus.

In order to make our results more robust, the survey will have to be repeated. An interesting future research question could be to analyse possible different strategies for when governments wish to increase university student cohorts without commensurably increasing funding. Would they best achieve this by increasing student-faculty ratios, reducing resources for research, reducing faculty salary increases, or by some other way? We are keen to explore further.

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An international assessment of bachelor degree graduates' learning outcomes

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This paper examines rationales, aspirations, assumptions and methods shaping an international assessment of learning outcomes: the OECD's Assessment of Higher Education Learning Outcomes (AHELO) feasibility study. The first part of the paper is analytical, exploring formative rationales, and shaping contexts and normative perspectives that frame the evaluation. The discussion then turns to review scientific and practical challenges involved in an assessment of the study, which will be tested on an international scale, and to sketch ideas and innovations being created in response. In conclusion, the paper offers reflective suggestions for positioning AHELO in global higher education, should the initiative prove feasible.

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Une évaluation internationale des résultats dans l'enseignement supérieur au niveau licence

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Ce document examine les justifications, aspirations, hypothèses et méthodes nécessaires à l'élaboration d'une évaluation internationale des résultats d'apprentissage : l'étude de faisabilité de l'évaluation internationale des performances des étudiants et des universités (AHELO) de l'OCDE. La première partie de ce document est analytique ; elle explore les justifications formatives et façonne les contextes et perspectives normatives qui encadrent l'évaluation. L'examen se penche ensuite sur les défis scientifiques et pratiques liés à une évaluation de l'étude qui sera testée à l'échelle internationale, et esquisse des idées et innovations en cours d'élaboration en réponse. En conclusion, le document propose des suggestions réfléchies sur le positionnement de l'AHELO dans l'enseignement supérieur mondial dans le cas où l'initiative s'avèrerait être réalisable.

Creating evidence to improve learning

This paper discusses work underway to develop and evaluate an international assessment of bachelor degree students' learning outcomes. Taking a research perspective, it examines rationales, aspirations, assumptions and methods shaping the Organisation for Economic Co-operation and Development (OECD)'s Assessment of Higher Education Learning Outcomes (AHELO) feasibility study (OECD, 2011a).* It looks into salient contexts and research foundations and explores a normative vision guiding development and evaluation. The paper then focuses on technical underpinnings and innovations, looking methodologically at solutions being developed and tested in response to challenges and contexts. In conclusion, it reviews next steps required to confirm the theoretical and technical feasibility of this assessment. It provides an introduction to a highly complex and multi-layered study, one with potentially significant implications for higher education worldwide.

The OECD proposed to undertake an international learning outcomes assessment in 2006 (Ischinger, 2006). Between 2007 and 2009 the idea was fleshed out at meetings which affirmed the policy and educational desirability of generating comparative insights into learning outcomes at the international level. Given the foundations and innovation required, participants acknowledged that while such assessment was likely to be possible technically, it was necessary to conduct a feasibility study before launching a full-scale assessment.

The AHELO feasibility study commenced in early 2010 and is scheduled for completion by the end of 2012. The study's broad objective is to determine "whether in an international context it is scientifically and practically feasible to collect objective data on final-year bachelor degree learners' capacity to use, apply and act on their knowledge and reasoning" (OECD, 2010a). Under the overall direction of the OECD and AHELO's Group of National Experts, a consortium of international agencies is developing and validating tests of

* This work has been funded by participating countries and the following foundations and organisations: Lumina Foundation for Education, Compagnia di San Paolo, Swedish National Agency for Education, Higher Education Funding Council for England (HEFCE), Gulbenkian Foundation, Riksbankens Jubileumsfund, Ireland Higher Education Authority (HEA) and Spencer Foundation. The policy steering of the project is carried out by the OECD on behalf of its member countries.

generic, economics and engineering learning outcomes. Some 35 000 students at 230 higher education institutions in 16 countries are collaborating in this venture. The work involves national centres in participating countries, international expert groups and a wide range of higher education stakeholders.

AHELO reflects an innovative fusion between educational measurement and policy research. The following methodological overview provides a helpful prelude for the balance of the paper. Supported by policy makers and institutional leaders, the study began with test developers and assessment experts working together to determine learning outcomes which students in specific fields of study should have achieved towards the end of a bachelor's degree. The developers worked with experts and stakeholders to design assessment instruments that map to these outcomes. As discussed later in this paper, these instruments go through a complex process of qualitative and psychometric validation, linguistic translation, cultural adaptation and independent verification to ensure they are measuring equivalent constructs in different languages. The tests are complemented by student, faculty and institutional questionnaires designed to collect demographic and contextual information. National managers in participating countries are responsible for co-ordinating system-level activities and are provided with ongoing training and support. Students are scheduled to take the tests in the first six months of 2012. Test data will then undergo rigorous psychometric modelling and evaluation to inform conclusions about the validity, effectiveness and relevance of an international assessment of student learning. Results will be reported to institutions and participating systems; lastly, a series of international reports will be prepared.

Shaping contexts and rationales

AHELO is being developed at a time when there is pressure to conduct more performance assessment in higher education. There is a multiplicity of rationales for this, not least the desire to better understand the transparency, effectiveness, diversity, productivity and accountability of an expanding sector. Within this broad framework, it is useful to review the main precursors and rationales that position and prompt the study. Of course, many motivating forces go beyond higher education: one particularly powerful driver is interest in knowing more about highly skilled individuals and the way they move around the world. The following analysis is more modest in intent, and concentrates on large-scale research and policy developments within higher education.

AHELO reflects a fundamental move beyond traditional collegiate approaches to assuring the quality of graduate outcomes. Traditionally, the

definition and assessment of learning outcomes has been an internal matter for universities, nuanced in various ways by interactions with regulatory agencies, professional bodies, other parts of the education system and the economy as a whole. But there are signs that in expanding systems traditional collegiate approaches to defining, assessing and monitoring academic standards no longer suffice to yield generalisable data on what graduates have learned and can do (AUQA, 2009; Coates, 2010; Ewell, 2009; Ikenberry and Kuh, 2009; Salmi, 2009; Spellings, 2006; VSA, 2009). This is not surprising, for these approaches were designed for elite systems rather than those much larger in scale. Developing methods for assessing what students know and can do, and for comparing outcomes across institutions can, in combination with numerous other kinds of formative assessment and evaluation, offer an empirical anchor which can be used by a variety of stakeholders – not least institutions and faculty – to underpin determinations of graduate competence.

The growth of the international "quality movement" over the last few decades reflects the same interest in reinforcing and extending traditional forms of quality assurance. Building on practice within the United States, as of the mid-1980s quality assurance systems emerged around the world that were essentially based on a three-phase model of self-study, external peer review and public report (Vught and Westerheijden, 1993). This process has naturally led to questions about international comparison and, directly and indirectly, quality assurance processes have provided the foundations for a considerable amount of benchmarking. The development of a robust quality culture and community is an important antecedent for AHELO, but the focus on inputs and processes exposed an opportunity – and indeed a need – to develop comparable information about what learners actually achieve. In calling for quality assurance that is more aligned to the needs of society Massaro (2010, p. 25), for instance, argues that "it is now urgent that the metrics be developed to measure standards and outcomes using some valuable examples as starting points".

Of course much quality-relevant data do exist, produced by institutions, systems and transnational networks. The collection of data on student engagement, for instance, has stimulated important discussions in several countries about learning processes and outcomes. Similarly, there has been a proliferation of surveys measuring students' satisfaction with educational services. Such collections can provide useful insights, particularly when linked with outcomes' correlates, however the data collected are subjective in nature and focus on educational processes rather than learning outcomes. Assessment collaborations, such as the United Kingdom's Medical Schools Council Assessment Alliance (MSC-AA, 2011) or the Australian Medical Assessment Collaboration (ACER, 2011), move one step further, delivering

learning outcomes data which can be generalised beyond local contexts. Ultimately, such initiatives are undertaken for formative purposes, flavouring the appropriateness and adequacy of their use in external initiatives. Various national approaches to assessing outcomes do exist (Nusche, 2008), yet few span national boundaries. Hence a particularly important rationale for a study such as AHELO is the production of consistent disciplinary or institutional information on learning outcomes that is international, and potentially global, in scope.

The proliferation of global rankings testifies to the hunger of systems, institutions and individuals for internationally comparable data on what universities achieve. Prominent initiatives include the *Times Higher Education* (TSL Education, 2010), the Shanghai Jiao Tong index of "world-class universities" (CWCU, 2010), and the *US News and World Report* Best Colleges (US News, 2010). With myriad others, these developments have driven a "rankings movement" which has considerably sharpened focus on data-driven cross-institutional comparison. Both the rankings and the discourse that surround them are a direct prompt for AHELO inasmuch as they highlight a need to compensate for the shortcomings of existing metrics. The lack of data on learning, the preoccupation with scientific research, the focus on whole institutions and the compression of institutional types create space and need for comparative data on learning outcomes. By far the most significant attempt to overcome many limitations of prevailing rankings is the U-Multirank project (CHERPA-Network, 2010). U-Multirank is, in many senses, a natural companion project for AHELO, having aspirations to increase the validity, scope, diversity and transparency of information on higher education.

Stemming from policy change within Europe, the Tuning Process (Tuning Association, 2011) is another important prompt for cross-institutional learning assessments. Beginning in 2000, "Tuning" is a process which involves describing and aligning degree outcomes. Working with communities of scholars, Tuning reflects the need for universities to sustain their unique missions within collaboratively determined frames of reference. The work, now expanded into the Americas and other regions of the world, provides important preconditions for AHELO as it spurs conversations about learning outcomes, encourages scholars to consider curricula and qualification comparisons and produces cross-national communities of practice. In 2008 and 2009 Tuning provided a direct input into AHELO through foundation work undertaken to map broad learning outcomes in the selected fields of economics and engineering (Tuning Association, 2009a, 2009b).

Transparency initiatives such as U-Multirank and Tuning, along with other large-scale initiatives, are important stimuli for AHELO and are reflective of more general trends. The shift from elite to mass – and in certain countries, to universal – systems of higher education has multiplied the

number of stakeholders with an interest in higher education outcomes. No longer limited to reproducing the high standing of the elite, higher education has taken on a broader responsibility for educating larger sections of the population. Greater interest and scrutiny – and hence greater transparency – is an inevitable consequence of this growth. While it would appear to be among the most important pieces of information on higher education, public data on what learners know and can do remain scarce in many systems.

This snapshot sketches key trends shaping the collection of generalisable data on students' learning outcomes. As it illustrates, significant foundations exist, but to date work has focused on elements of higher education which are relatively easy to compare such as institutional structures, educational processes and programme content. Explorations of institutional and discipline-specific performance in student learning are growing from a low base. Yet greater insights into comparative learning across different institutional types and missions is of increasing importance in an environment of ever-growing global mobility of students and graduates, and in the context of finding viable policy solutions to sustaining universal higher education. Despite all the foregoing developments and initiatives, there remains a need for rigorous and generalisable measurement of student learning outcomes which is comparable across institutions and across national systems. A feasible AHELO has the potential to fill this gap, building on fertile ground created through various projects undertaken over recent decades.

Aspirations and guiding principles

The collection of information on learning outcomes can be viewed as one means of spurring large-scale reform at the institutional level. Drawing from the AHELO assessment design (OECD, 2010b), the "guiding principles" elaborated here detail aspects of this intent. These principles are deliberately forward looking and aspirational. They are intended to contribute foundational insights into what a feasible assessment of higher education learning outcomes could look like. While perhaps lofty, in the absence of precursor studies they provide a positive normative framework within which innovation and evaluation can proceed.

Basically, the development work rests on an assumption that it is indeed possible to undertake an international assessment of final-year students' capacity to use, apply and act on their knowledge and reasoning. This, in turn, implies that new methodologies and technical standards can be established for higher education research. It means that policy makers, institutional leaders, faculty and students can be engaged, and that they see assessment

processes and outcomes as valuable information on education. It implies that institutions can take steps to convert results into improvement-oriented change, industry and government leaders can see new possibilities for assessing graduate capability and international education can make use of a new data source. Importantly, it implies that learning outcomes data are seen to offer a significant, effective and additional means of understanding higher education.

The international dimension is vital for AHELO and the OECD hopes that comparative data on learning outcomes will provide a powerful force for institutional benchmarking. Simply by asking institutions to participate in an international assessment sends a message that they are part of an interdependent global knowledge community. Providing multidimensional reports to institutions highlights international learning networks and the transnational flow of knowledge. Learners and graduates should also benefit from better information on outcomes that is international in scope. When reported in a sound fashion, information on outcomes has the potential to offer powerful insights that prospective learners can use to inform study decisions. Any benchmarked performance feedback provided to learners and graduates offers insights to them and to prospective employers or graduate institutions that might assist mobility and placement in a whole range of ways.

As a guiding structure for evaluation, it is assumed that measuring later-year students' learning and capacity to perform will become a routine facet of higher education practice. Such metrics offer information that complements conventional assessments of academic achievement, and facilitate progressions into further study and professional practice. At the same time, the information can provide institutions and faculty with a reference point against which to estimate the efficacy of their own goals and practices.

But to add value, and to avoid stifling diversity, which can be dangerous, such assessments need to go beyond testing knowledge. They must test students' capacity to reason in complex and applied ways, and to use skills and competencies effectively in different settings. The assessments need to be sophisticated and to align with the forms of thinking and professional work in which most graduates will engage. They need to employ a wide range of methods, provide for a more balanced view of higher education quality, and tap into capabilities that both educators and professionals recognise as important for educational success – capabilities such as collaboration and teamwork, oral and written communication skills, creative and analytical abilities, and leadership. It is important to take account of the disciplines within which students learn and the trans-disciplinarity of professional life. Developing such assessments requires innovation. It requires conceptualising

new constructs, developing items and systems for capturing high-level reasoning and for reporting in informative and informed ways.

In a sector increasingly driven by competitive forces, it is vital that AHELO stimulates what Vught and Kaiser (2008) refer to as diversity and diversification. With the notable exception of U-Multirank (CHERPA-Network, 2010), existing rankings tend to focus on vertical institutional diversity and are unable to address programmatic diversity (Marginson and van der Wende, 2007). By developing multidimensional approaches that move beyond standardised institutional rankings, information about learning outcomes has the capacity to inform and enhance each institution's distinct mission and autonomy, as well as subsequent efforts to improve performance.

Fuelling evidence-driven continuous improvement is a powerful guiding principle. Collecting and reporting statistical data, regardless of how novel and intriguing, is rarely sufficient to prompt institutional or systemic change. Hence to yield successful returns for institutions, systems and stakeholders, AHELO must embrace broader plans for engaging institutions, faculty and students in evidence-based change. Large-scale institutional or programme-level assessments can be difficult to link with practice unless clear strategies are in place to help leaders, teachers and students access and use information (Coates and Seifert, 2010). Without strategies to link reports in meaningful ways across systems, institutions and individuals it is difficult to energise the people that make change happen. Hence an overarching engagement strategy which links individuals and institutions, disciplines and faculty, leaders and systems must be at AHELO's core. Indeed, participating in an assessment process should be an informative experience in itself.

Challenges and innovations

AHELO is *sui generis*, and in its infancy. To be successful, innovation of such scope needs to explore and overcome major scientific and practical challenges – many of which may be unknown or unexpected. Constructing an assessment that is valid across institutions, cultures and disciplines means accounting for factors such as institutional diversity, differences between national systems of higher education, selectivity – which is inherent to systems and institutions –, as well as variations in the duration and content of programmes. Other aspects which also need to be considered are how to motivate students and institutions to participate, how to ensure a fair assessment of institutions and programmes, and cultural and linguistic diversity. The remainder of this paper is essentially methodological. It explores developmental challenges and design innovations intended to initiate the assessment.

Engaging change: converting the controversial to the common

Engaging a large global industry around new forms of data that relate to core educational business is a significant proposition. A major amount of work is required to understand philosophical, political and historical scepticism to assessment innovation and to inspire stakeholders to see "learning data" as part of the future higher education scenario. While global trends provide an increasing predisposition for AHELO, considerable work is also required to link rationales with organisational and educational realities. This task is complicated by any perception or assertion that generalised scientific assessment hinders – rather than enhances – institutional or faculty practices, autonomy or experiences. Clearly, the existence of information opens possibilities for its misuse, but such risk can be minimised by sound design and regulation of data and reports. Indeed, as discussed below, well-formed reports carry a real potential to help higher education institutions and systems innovate, grow and respond to the several challenges that institutions face.

Since 2006 AHELO's innovators (policy leaders and technical experts) have engaged early adopters (participating ministries, institutions, stakeholders and experts). Country participation has grown from 7 in 2008 to 16 in late 2011, with a rise from 70 to 230 in the potential number of participating institutions. Technical development underway since 2010 has engaged many hundreds of organisations and individuals. To be feasible, AHELO needs to expand further and involve leaders, faculty and students in the data collection and reporting process. Engaging the global higher education system more broadly lies beyond the scope of a feasibility study. But there are early signs that this may be possible, given a notable shift, since 2006, from discourse questioning rationales and methodology to discussions about more tangible matters such as operations, results and timelines. Ultimately, as with existing metrics for admissions and research, it is possible to imagine a culture in which assessment of learning outcomes is integral to the architecture of higher education.

The prospects of such change hinge, to a large extent, on the capacity of systems to lead required reform. While AHELO is led and developed by independent agencies, national centres in participating countries take considerable responsibility for implementation. Various models have been used within countries to establish centres that combine higher education policy expertise with educational measurement capability. Around one-third of the countries participating in the feasibility study has housed national operations within government-affiliated research agencies; a further third is working from university research centres. National centres in remaining countries are located at independent research agencies, quality agencies, or in

peak bodies. National centres are funded and managed in a range of ways, and draw on external experts for translation, content advice and analysis. Together, the centres spotlight new approaches to leading large-scale assessment work within higher education. They highlight the emergence of new institutional architectures, practitioner networks and research communities.

Balancing generalisability and specificity

Managing tensions between specificity and generalisability is one of the greatest challenges in research that crosses cultural, linguistic, disciplinary, programmatic, national, curricula and institutional boundaries, amongst others. To be valid, assessments must be relevant to local contexts of measurement and reporting, and also sufficiently global to enable comparability. Defining and managing or resolving tensions between specificity and generalisability is essential to the success of such research. In many areas it is possible to apply proven methods (OECD, 2009), even though these may be novel or less common in higher education. In other instances, innovative assumptions, perspectives and design solutions are required.

For instance, a considerable amount is known about methods for establishing linguistic and cultural comparability, drawing on experience in studies such as PISA (OECD, 2011b) and TIMSS (IEA, 2010). It has been possible to adopt and adapt approaches proven with school-level research for AHELO. In brief, English source versions of test instruments undergo "dual translation" in participating countries, involving two professional translators working independently to arrive at separate translations. These translations are then "reconciled", a process whereby domain and language experts review translations and retain the strengths of each to arrive at a superior composite version. Except for generic skills, the reconciled translation is then verified independently, a process that involves further scrutiny by domain and linguistic experts to ensure the translated material is optimised for a given national context. Even where translation is not required, the English source version passes through a stringent process of adaptation and verification to ensure that an optimal national version is delivered. The implementation of a detailed multi-stage approach ensures that translated assessments are linguistically and culturally equivalent to source versions, facilitating the reliable measurement of student performance internationally.

Of course, it is critically important to achieve clarity in relation to the outcomes to be assessed. Combining "Tuning" processes with techniques used by measurement scientists to produce assessment frameworks offers a practical and robust solution. In AHELO, test developers draw on current developments (for instance, Tuning Association 2009a, 2009b; Quality

Assurance Agency, 2006) to define expected competencies. As anticipated, given the positioning of these competencies on the qualification hierarchy, they involve more than the basic reproduction of accumulated knowledge, calling on students to mobilise thinking skills to solve real-world problems (OECD, 2003). Assessment developers work closely with advisory groups composed of domain assessment experts from around the world to agree key competencies and summarise these in assessment frameworks. The purpose of the frameworks is to provide a rigorous backbone to guide the development of assessment tasks, and test developers are able to demonstrate that the assessment tasks map closely to the assessment frameworks.

When developers focus on outcomes it is not necessary to harmonise programmes, curricula or pedagogy, but it remains important to account for any implications arising from differences between educational structures, resources and approaches. A specific engineering competence, for instance, must be assessed in ways which reflect its manifestation in the curriculum, institutional culture and mission, as well as the epistemologies that shape teaching. This is a significant point that must be addressed to avoid irrelevance or retreat into scholarly particularity or relativism. This calls for methods and evaluation strategies that balance practical, philosophical and scientific considerations. Much can be proven through standard measurement science. Other uncertainties can be resolved through wide-scale consultation or expert review. Various practicalities imply certain necessary compromises.

A scientific sampling strategy

A well-designed, managed and regulated sampling approach is critical to any international educational assessment. Without controlling who and how many people take the test, it is not possible to assure the statistical power and relevance of estimates – even with *post hoc* statistical adjustment. An international assessment such as AHELO is challenged in several ways by this requirement, for while the technical principles of sampling are sustained these have not been applied at scale in post-compulsory education (with the notable exception of TEDS [IEA, 2011]); uncertain adaptations may be required and various conventions and precedents do not exist.

Developing a pertinent sampling strategy that affords appropriate balance between technical, practical and substantive considerations is an important facet of AHELO. Within the constraints of a feasibility project, the sampling strategy seeks to secure the voluntary participation in the test of a sufficient number of randomly selected individuals or groups. Participating individuals will interact with a stratified random sample of test items which are mapped against the contents and constructs given in the test instrument specification. Underpinned by the kind of sophisticated methodological reasoning that informs school-level assessments (OECD, 2009), the design is

expressed in simple ways that can be adapted to systemic and institutional contexts. A controlled and devolved approach is used whereby national centres and international experts reach agreement on national approaches; national centres work with institutional co-ordinators to draw samples, then international monitors verify and assure the comparability of participant yields. The techniques and their application have been well-rehearsed in school-level assessments, but their relevance in AHELO hinges on whether it is possible to engage targeted students in post-compulsory education. Significant analysis will be required, particularly given the lack of various benchmarks, to determine whether the sampling yields robust and defensible performance estimates.

Quantifying complex cognitive responses

While well-designed multiple choice questions can measure complex real-world thinking, many advanced forms of reasoning are best measured using tasks that require students to construct their response in the form of writing or drawing rather than selecting from a set of pre-defined alternatives. Administering such "constructed response tasks" necessitates using automated or manual scorers. Designing valid and efficient approaches to scoring constructed response tasks is another area requiring methodological innovation. As with sampling, many (if not all) of the scoring methods required for AHELO have been developed and tested in diversified and large-scale contexts. AHELO adds extra dimensions, however, inasmuch as it requires consistency in difficult and complex cognitive domains, and traverses many educational, cultural and disciplinary contexts. Data produced from students' constructed responses will not be usable without effective scoring strategies, operations and quality controls. If the same response is scored differently by different scorers, or even by the same scorer at different points in time, reliability suffers, which in turn threatens validity and results.

With this challenge in mind, scoring methods have been designed to enact desired technical principles in large, devolved and diverse contexts. Each country selects a senior academic with expertise in economics, engineering or generic skills as lead scorer, with scorers undergoing rigorous technical and practical training. This training involves methodological analysis and comparing benchmark student responses from participating countries with rubrics produced by test developers. This process enables detailed discussions of how score points are allocated to differing responses and allows lead scorers to become thoroughly immersed in the intricacies of quantifying student response. At the same time, any linguistic and cultural differences can be highlighted and addressed, facilitating international consistency. Prior to national scoring, lead scorers recruit and train a national scoring team. Scoring is conducted using standardised online tools with lead

scorers closely monitoring other scorers' work to ensure individual and national consistency and randomly auditing scored responses to determine scorer accuracy.

Despite the careful design of scoring procedures in AHELO, it is important to note that methods for scoring tertiary student test responses across national boundaries are at an early stage of technical development. Lessons can be gleaned from large-scale national assessments, but much needs to be established during AHELO's lifetime and innovative solutions will need to be found to problems which arise during scoring activities. Particular challenges lie in scoring constructed response tasks across cultures and languages, where not only syntax, vocabulary and script vary, but there are also differences in accepted approaches to communication and the nature and description of reasoning.

Reports that engage stakeholders and prompt change

Studies like AHELO are not conducted to generate statistical estimates, but to drive productive reform. Perhaps the biggest challenge confronting AHELO is engaging stakeholders in evidence-based change. The real value and contribution of the assessment derives not just from reading reports, but from international communities being formed to design and construct tasks, participate in the assessments, and use results to guide individual, institutional and system growth. In a study with global reach, in which an assessment cycle might span years, it is important to create opportunities for engagement. Effective engagement is decisive for the study's impact on reform.

The study's approach engages stakeholders in each phase of the work. By way of example:

- A stakeholder consultative group – including a broad group of higher education stakeholders (associations of higher education institutions, student and teachers' unions, quality assurance agencies, professional associations and business groups – has been engaged in the work since its inception, shaping design, development and review.
- Even within the constraints of the feasibility study, framework and test development has involved hundreds of experts and faculty in structured conversations about learning.
- Along with the tests, context questionnaires have been developed to engage institutional representatives and faculty in data collection, and help ensure analyses and reports resonate with local contexts.
- Taking part in an international assessment has the potential to be an intrinsically engaging experience for participating countries, institutions, faculty and students.

- While respecting necessary confidentiality and privacy constraints, reports are being designed to be as transparent and informative as possible.
- Participating countries are already establishing support mechanisms to help systems and institutions identify how to interpret reports for the purposes of diagnosis, monitoring and improvement.

By its conclusion, it is hoped that AHELO will have yielded important new insights into core facets of higher education. At the same time, it will have taken only the first tentative steps in a large and growing field of higher education. Significant work will be required to link AHELO with existing harmonisation, ranking and classification exercises, to determine the broader strategic significance of such assessment and to build capacity within funding, regulatory and quality agencies. Efforts will also be needed to boost institutional capacity to manage and understand outcomes data, to assist students and their parents to make better sense of information on higher education and to support emerging research communities that underpin applied work with methodological and scholarly inquiry.

Initial impressions, and strengthening foundations

This paper offers an introduction to efforts underway to build an international assessment of bachelor degree learning outcomes: work that touches major aspects of higher education. It has surveyed contexts driving the study and methodological innovations required for a feasible outcome. Given the breadth and potential significance of this work it has only been possible to provide a brief overview of the highly complex and multi-faceted research involved. By the end of 2012, it is anticipated that data will have been collected from students and faculty at some 230 institutions worldwide, and then subjected – along with myriad other forms of data – to multifaceted analysis and review. Only then will it be possible to evaluate the feasibility of measuring learning outcomes across cultures in ways which are valid, reliable and practical.

The evaluation framework developed at the start of the study (OECD, 2010c) sets forth the qualities required of a feasible international assessment. In terms of instrumentation, it will be necessary for each assessment – engineering, economics and generic skills – to reflect international consensus about the content areas that it is important to assess. From an operational point of view, the instruments should reflect the spirit and intent of the content specification, hence it will be necessary to secure international consensus so that the student, faculty and institutional questionnaires capture important contexts that shape higher education learning outcomes. To be successful in terms of implementation, the assessment will need to be practical and methodologically rigorous, be generalised cross-nationally,

cross-culturally, cross-linguistically and cross-institutionally. It will also need to effectively engage systems, institutions, faculty and a random sample of students, be delivered successfully and in a consistent way across countries, be scored in cross-linguistically and cross-culturally generalisable ways and be reported in ways that engage systems and institutions.

As this paper has indicated, work is proceeding against a backcloth of numerous diverse and stimulating research dynamics. Essential to such work is that a large number of international agencies share a growing interest in collaborating in order to better understand and improve higher education outcomes. It is essential to produce valid and reliable assessment resources and processes. This should include a consultative and technically rigorous production of assessment frameworks and test instruments, the effective operationalisation of assessment materials, deployment using quality-assured and efficient implementation methods, and production of informative data products and reports. Adopting a multidimensional and multidisciplinary stance is vital to drive improvement and diversity. Confidentiality and security are obviously intrinsic to testing, but these must be balanced with transparency. Clearly, in times of financial volatility any initiative with global intent must be affordable and scalable.

Learning is core to higher education and data on learning outcomes is relevant to a wide range of stakeholders. Significant work will be required to link outcomes assessments with existing harmonisation, ranking and classification exercises. It is necessary to build national capacity within funding, regulatory and quality agencies, and to boost capacity within international communities to manage and understand outcomes data. Over time, work will be required to help students and their parents make better sense of this new information on higher education. More research communities will emerge to underpin applied work with methodological and scholarly inquiry. Current research is yielding important new insights into higher education. At the same time, it reflects only first tentative steps in a significant and emerging field.

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The impact of the Bologna Process on academic staff in Ukraine

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Academic staff in Ukraine face a convergence of institutional and professional pressures precipitated by a national economic crisis, projected declines in enrolment and dramatic changes to institutional procedures as institutions implement the Bologna Process. This article examines the extent to which these pressures are reshaping the way academic staff engage in their day-to-day work, their careers and their role in their university. Findings indicate that faculty are caught in a confluence of conflicting demands that elicits adaptive coping strategies and threatens to undermine national efforts to modernise Ukraine's higher education system.

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L'impact du processus de Bologne sur le personnel universitaire en Ukraine

par
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Le personnel universitaire en Ukraine est confronté à la convergence des pressions institutionnelles et professionnelles générées par une crise économique nationale, des baisses d'inscriptions prévues et des changements conséquents dans les procédures institutionnelles des établissements supérieurs découlant de la mise en œuvre du processus de Bologne. Cet article examine dans quelle mesure ces pressions modifient la carrière du personnel académique ukrainien, leur investissement au quotidien et leur rôle dans la recherche universitaire et l'éducation. Des résultats indiquent que les universités ukrainiennes se situent au confluent de demandes contradictoires qui suscitent des stratégies d'adaptation et qu'elles menacent de miner les efforts nationaux pour moderniser le système de l'enseignement supérieur en Ukraine.

Introduction

Over the last two decades, higher education systems in Eastern Europe have been navigating through an era of rapid transformation. Expanding higher education and improving its quality have risen to the top of national priorities as governments embrace the notion that higher education is a key component of their efforts toward economic and social development (Chapman, 2009). However, the rapid expansion of higher education and efforts to align it with Western European standards have often come at a cost, and sometimes with a twist. In few places is this truer than in Ukraine.

Since the turn of the century, higher education in Ukraine has experienced explosive enrolments. Between 2000-09, tertiary enrolments increased by about 185% (UNESCO, 2010a). The percentage of the eligible age group enrolled in university studies grew from 47% in 1999 to 79% in 2008 (UNESCO, 2010b), transforming the system into one of nearly universal access. The country has absorbed this growth both through expanding public higher education and by encouraging the development of private higher education options. As in other Eastern European countries, however, the expansion of access has often been accompanied by concerns about insufficient funding and declining quality (Kovtun and Stick, 2009).

In 2005, in an effort to raise the international legitimacy of its higher education system, Ukraine joined the Bologna Process. By doing so, it committed to an international effort to harmonise higher education that involved redesigning the curriculum, shifting to a three-cycle degree structure and submitting to cross-national mechanisms of quality assurance (Clement *et al.*, 2004; Kremen and Nikolajenko, 2006). Recent reports suggest that the financial austerity facing Ukrainian higher education, coupled with the demands of implementing the Bologna Process, have put great pressure on both institutions and individual academic staff (Kovtun and Stick, 2009).

Policy options available to governments and higher education leaders centre to a large extent on how they mobilise, deploy and manage academic staff.[1] Given that they are responsible for teaching courses and conducting research, faculty largely define the character, quality, productivity and relevance of each institution and of the higher education system as a whole (Chapman, 2009). Indeed, college and university faculty are the gatekeepers of higher education reform. Their attitudes and responses are crucial in

determining the odds of successful reform and the modernisation of higher education.

Following its adoption of the Bologna Process, Ukraine provides a particularly interesting national context for examining how faculty in a post-communist nation construct their careers at a time of rapid change. This study examines the extent to which the convergence of challenges currently faced by higher education institutions there is reshaping the way academic staff view their careers and professional roles. Our findings have wide relevance given the number of countries now seeking to align their higher education systems with international standards, creating new pressures for academic staff (Zgaga, 2006; Salmi, 2009).

Conceptual framework

Observers of higher education reform point out that during times of transition and reform, not all components of a higher education system embrace change at the same rate, neither do all actors necessarily agree on the shape of the new structures toward which they are moving (Chapman and Austin, 2002). Several authors offer theoretical models for thinking about how organisations and individuals respond to the vortex of pressures created in situations where elements of a larger reform process move forward at different rates. This study draws on Weaver's (2008) work in organisational sociology to highlight the key dynamics which emerge in a time of transformation. It also points to Bateson's (1972) contribution to the psychology of communications as a lens to examine how those dynamics impact individual faculty in the Ukrainian system.

Weaver (2008), building on earlier work by Pfeffer and Salancik (1978) and Brunsson (1989), argues that social institutions are dependent on externally conferred legitimacy, funding and demand for services. To receive funding and public support, they need to be responsive to public agendas. Yet social institutions also have their own informal structures, values and norms that may be different from those in the external culture. In some cases, conflicts arise between these societal goals and institutional objectives. We posit that this may be the case in the public university sector in Ukraine, where faculty are located at the intersection of a changing public agenda and the informal structures of the public university. The introduction of the Bologna Process was one of numerous shifts in European higher education policy over the last two decades, and it occurred at a time of fiscal austerity and decreasing enrolments. The public agenda of integration and harmonisation presented universities with the difficult challenge of navigating the gap between the government's new goals and their traditional goals, as reflected in the institutional structure.

According to Weaver (2008), in response to tension generated by multiple expectations, a common coping strategy for an institution is to adopt reform goals and introduce structural changes in order to signal conformity to environmental expectations, while at the same time pursuing a different internal course of action. Caught in a squeeze of conflicting expectations, organisations "decouple". They build gaps between those activities that are externally demanded, on the one hand, and those that flow out of internal structures and culture on the other (Weaver, 2008, p. 5).

Eastern European sociologists have often noted that such discrepancies between external and internal actions are particularly ingrained in post-communist societies (Sztompka, 2005). Fake and hidden activities served as coping strategies for both individuals and institutions to deal with the unrealistic demands of a centrally planned economy (Lutyński, 1990) and they have persisted as a strategy for navigating the turmoil of the post-communist era (Tyszka, 2009). Weaver's framework appeared particularly relevant in the context of this study, in light of the fact that scholars working in Eastern Europe have often observed a dissonance between the rhetoric and the reality of reforms since the post-communist transition (Marga, 1997). We posit that in the Ukrainian context, the process of decoupling can be framed as a series of contradictions that may lead academic staff to give lip-service to the symbolic goals needed to placate the environment, but in fact operate within an informal structure that determines how the work actually gets done (Weaver 2008, p. 5).

The dynamics Weaver discusses at the organisational level have a counterpart at the level of individuals. For academic staff, the effort of trying to satisfy multiple demands on their time can be framed as what Bateson (1972) calls a "double bind". While contradictory messages are common in interpersonal relationships, a double bind occurs when it is vital for the addressee to distinguish what kind of message is being transmitted, but conflicting communications are perpetually locked in ambiguity. Bateson suggests that for a double bind to occur, an individual must be in a significant relationship with an authority which issues contradictory statements or demands; these demands can be construed as mutually incompatible and the individual is incapable of addressing the situation or discussing it for the purpose of clarification. A double bind is most likely to arise in settings involving unequal power relations and limited personal autonomy. Since faculty and university authorities operate within an employment relationship and the higher education sector in Ukraine is rife with pressures and uncertainties, we posit that the concept of a double bind provides insight into the individual responses of academic staff.

Context

Higher education in Ukraine

The legal framework that sets the organisational and financial basis for higher education in Ukraine is based on modern principles of merit-based access, as well as the targets of raising the levels of achievement and the quality of academic research (Ukrainian parliament, 2002). Nonetheless, the internal structure of the system is still highly centralised. As in many other post-Soviet nations, the Ministry of Education and Science has considerable control over how higher education institutions are run; as a result, Ukrainian universities are characterised by limited autonomy at all levels.

Government funding for higher education institutions is allocated in a manner that leaves them with little control over their budgets (Anon, 2009).[2] Centralised control also applies to the universities' instructional programmes, the composition of their governance bodies and their organisational structures.

While universities operate within a fairly tight policy environment, they have some autonomy when identifying study programmes, recruiting staff, delivering additional educational services, developing research programmes, managing international collaboration and the use of institutional facilities. The question of individual academic autonomy is a little more delicate. Universities' internal structures tend to operate as steep hierarchies. Rectors hold a considerable amount of power (Kremen and Nikolajenko, 2006) and organisational actors share the assumption that decisions are made at the top. In this type of hierarchy, those lower down the organisational ladder see themselves as doers whose role is to implement decisions made further up the chain (Savage, 1990; Chapman *et al*., 2009).

Limited autonomy and a steep power ladder create a fertile ground for the emergence of double binds (Bateson, 1972). Without the power to confront the dilemmas communicated at higher levels, individuals and institutions are more likely to find themselves locked in ambiguity over perceived expectations.

Context of the study

This study was undertaken at a large university located outside the capital city, Kiev, that had recently undergone an external evaluation. The institution was selected on the basis of its accreditation as a national university and its location. The university offers a full range of degrees (Bachelor's, Master's, Candidate of Science and Doctor of Science) and is held in high academic regard. It has a student population of about 30 000 and it is

ranked in the top three public universities in its specialisation and in the top three higher education institutions in its region (Anon, 2009).

The senior management team consists of the rector and several vice-rectors. It reports to the academic board, the university's top decision-making body which has the ultimate decision-making powers on a wide range of issues, ranging from broad strategic decisions to individual financial assistance and scholarships. In parallel, there is a similar top-heavy distribution of power between the faculties and departments (Anon, 2009). The curriculum is largely determined by the state, which leaves little space for innovation. While some faculty members are experimenting with newer pedagogical methods, instruction is, for the most part, delivered through lectures, with compulsory class attendance.

The complexity of organisational structure poses a challenge to the university's efforts to adjust to the changing environment. It is organised into nearly 70 departments in several branch campuses. In some cases, faculties appear to offer similar and overlapping coursework and programmes (Anon, 2009). With so many units, efforts to orchestrate a move in the same direction have been complicated as faculties, departments and individual academic staff members have adjusted at different rates to the new enrolment patterns, fiscal conditions and changing instructional priorities. This has led to misalignments among programmes and confusion about priorities.

The uncertainty and confusion arising from institutional change implemented through cumbersome channels in the organisational structure further contribute to the emergence of double binds, which directly affect faculty members. The diversity of responses at various levels of the hierarchy increases the odds that they receive messages that may, on occasion, contradict one another. The likelihood of double binds increases with the environmental challenges discussed below, which add to sources of pressure on the institution.

A convergence of challenges

The study revealed that the university is in the middle of a challenging transition period, created by the convergence of four factors.

1. ***Enrolment declines***. Demographic shifts have had a dramatic effect on the university and its funding. After a period of explosive enrolment growth, it is facing the prospect of sharp declines in student admissions. In the early 1990s, the birth rate was low, resulting in a drop in the size of current college-age cohorts. The situation may be compounded in the future by a government plan (still under discussion) to increase the duration of basic education by either one or two years as of 2012, effectively eliminating secondary school graduations for those extension years. This would cut the

flow of secondary graduates, seriously deplete the university's student intake during that time and, consequently, further reduce its tuition income.

2. ***Fiscal austerity***. Since the university's budget is heavily tuition-dependent, the imminent enrolment declines will have grave financial consequences for the institution. One-third of the university's annual budget comes from government funding and two-thirds are self-generated, primarily from student tuition. As it is, Ukraine has been severely hit by the global economic crisis. This has resulted in greater problems for students in raising tuition fees and for the university in securing research funds from the government and other outside sources. Financial austerity has introduced uncertainty for academic staff, since they are hired on short-term contracts and their job security is heavily contingent on the fiscal situation of the institution.
3. ***Implications of Bologna***. When Ukraine embraced the Bologna reforms, the university entered a period of radical change in the educational process. It involved changes in the design of the curriculum, the academic calendar and student grading procedures, despite the fact that the institution was already in a difficult financial position. One of the outcomes of this change is that academic staff were expected to shift from teacher-oriented to student-centred instruction and to respond to a greater emphasis on research. The national and institutional commitment to comply with the Bologna goals adds complexity to the working lives of faculty and administrators. Yet, despite the pressure to embrace the Bologna-induced changes, there has been no systematic instructional redesign effort or real support for staff to implement these changes and the results seem patchy to external observers (Anon, 2009).
4. ***Push for research.*** In an effort to achieve greater national and international recognition, the university is trying to shift from being a primarily teaching-oriented institution to one which focuses on research. Consequently, while the university has been a teaching-oriented culture, academic staff are now coming under considerable pressure to conduct research. The university has taken several steps to develop applied research tailored to the needs of the region and its enterprises.

Methodology

We selected a purposeful sample of academic respondents and over a two-week period in May 2010, we conducted interviews with 32 academic staff and 7 senior administrators. The sample had a good gender balance and approximately equal numbers of those who entered university before and after Ukraine's independence in 1991. The sample consisted of comparable

numbers of academic staff from all main programme areas and all academic ranks were represented. The seven senior-level administrators were either deans or university-level administrators. The interviewees' characteristics are summarised in Table 1.

Table 1. **Distribution of participants by age, gender, and academic rank**

Rank	Entered university after independence (37 years old or younger)		Entered university before independence (38 years old or older)	
	Male	Female	Male	Female
Senior Administrator	1	0	6	0
Department head	1	0	1	4
Professor	3	1	2	4
Lecturer	3	8	1	4
TOTAL	8	9	10	12

Source: Marta A. Shaw, David W. Chapman and Nataliya L. Rumyantseva (2011), "Organizational Culture in the Adoption of the Bologna Process: A Study of Academic Staff at a Ukrainian University", *Studies in Higher Education*, published online 26 September 2011, *http://dx.doi.org/10.1080/03075079.2011.614336*.

Each interview lasted approximately one hour with an hour of buffer time between interviews to allow for continuation if the interviewee wished to extend the discussion. The interviews were conducted in Ukrainian, Russian or English, depending on the participant's preference.

The protocol for the semi-structured interviews was designed to collect information on interviewees' beliefs related to the nature of their work, their perceptions of environmental and institutional change, professional accountability, work motivation, and career and job satisfaction (Table 2). Interviews were recorded and contemporaneous notes were taken. Content analysis of interviews was conducted in the original languages in order to identify recurrent themes as well as the frequency and intensity with which respondents held those views.

Findings

Findings indicate that academic staff in Ukraine are caught in a trap of multiple and sometimes irreconcilable demands, driven in large part by the interaction of fiscal pressure on the university and the national commitment to raise the quality of its higher education system. Content analysis indicated three major cross-cutting themes emerging from the data. Each is best understood as a dilemma faced by academic staff that contributes to generate a double bind.

Table 2. **Faculty beliefs about their professional work**

	Frequency	Per cent
Sources of job motivation		
Love of teaching	30	77%
Stability of employment	21	54%
Prestige	17	43%
Limited options outside university	15	38%
Social protection and security	14	36%
Community and friendship	13	33%
Flexibility	10	26%
Proximity to family	6	15%
Love of research	6	15%
Not to be bored	3	7%
Sources of job satisfaction		
Working with students	29	74%
Always doing something new	17	43%
Ability to travel	5	13%
Research	4	10%
Sources of job frustration		
Insufficient salaries	29	74%
Lack of time for personal life	20	51%
Lack of time for research	19	49%
Too much paperwork and administrative work	18	46%
Unmotivated students	10	26%
Not getting paid to do administrative work	7	18%
Beliefs about salaries		
My salary is not sufficient	28	72%
It is impossible to live on my salary alone	19	49%
My income is supplemented from other sources	33	85%
Changing nature of demands		
Bologna process creates a lot of new pressures	29	74%
We are expected to do more research	32	82%
We are expected to teach in a more student-centred fashion	31	79%
We are expected to do more paperwork and administrative work	23	59%
Beliefs related to research		
I experience (or exert) a lot of pressure to do research	29	74%
Research pressure has increased since Bologna	33	85%
My teaching load is too large to do good research	21	54%
The university does not support me sufficiently to do research	17	44%
Beliefs about job security		
My job security depends on research	37	95%
People who don't grow professionally don't have their contracts prolonged	24	61%
Getting a doctoral degree brings greater job security	23	59%
Contracts are very short	18	46%
The university is very concerned with profitability	16	41%
My colleagues are concerned about their jobs	12	31%

Source: Marta A. Shaw, David W. Chapman and Nataliya L. Rumyantseva (2011), "Organizational Culture in the Adoption of the Bologna Process: A Study of Academic Staff at a Ukrainian University", *Studies in Higher Education*, published online 26 September 2011, *http://dx.doi.org/10.1080/03075079.2011.614336*.

1. Faculty are expected to do more research, but their salaries are based on their teaching loads.

Those interviewed for this study reported a significant increase in the pressure to conduct research since the country joined the European Higher Education Area. A large majority (74%) of participants claimed that they either exert or experience a great deal of pressure to conduct research and 85% attributed the increased pressure to the adoption of the Bologna Process. They also stressed that research is not remunerated and they find it difficult to reconcile this fact with the academic workload, determined by the Ministry of Education and Science, that forms the basis of their salaries.

Workload is based on a standard formula that specifies an expectation for faculty to devote between 750 and 900 hours per year to instructional activities (course preparation, teaching, grading, advising), depending on their position and academic rank. Overall, interviewees estimated that they spend from five to seven hours a day interacting with students. They saw this as a heavy workload, and over half described it as a source of frustration. Faculty who entered university after Ukraine's independence, especially those familiar with university teaching loads common in other countries, were the most vocal in their criticism of the instructional time required of them. One faculty member observed:

> We have to teach an average of four courses each semester. It's impossible to be an expert in all of these things – but if we taught less, we wouldn't have enough teaching time to receive a salary.

Their views found sympathy among some university administrators. In the words of one:

> Nine hundred hours of contact time? In Europe, it's half that.

While a heavy workload and strong pressure to publish would perhaps not be problematic in themselves, participants of this study reported two additional factors that significantly complicate the current picture of faculty work.

First, respondents said that the Bologna Process has placed new demands on their time. They described having to adapt their curricula and syllabi to the new module system, to create new teaching materials, change the grading system, design new tests and handle much more paperwork than before. Commenting on the rising expectations, faculty repeatedly claimed that the implementation process has cost them significant amounts of time and effort.

The core issue, however, is that despite increasing expectations, faculty salaries remain insufficient; by some accounts they are three or four times lower than what they could earn in the private sector. Not surprisingly, this constitutes a source of widespread dissatisfaction. The basic monthly salary

of a faculty member at this university is about USD 200, with the possibility of additional compensation for seniority and academic rank. The highest salary openly quoted in an interview was USD 600 per month for a department head with the academic degree of *Doktor Nauk* which is equivalent to the *Doktor Habilitatus* in the German system.

Participants found it unfair that the heightened expectations they experience are not accompanied by a proportionate decrease in instructional workload or an increase in pay. As two faculty members put it:

> Expectations go up, but our salaries stay the same.

and

> We have European expectations, but Ukrainian funding.

Yet another young faculty member observed:

> A cleaning lady in a private company makes as much money as I do. How can that be fair? We are educating the young people on whom our future depends. How they are taught will determine how we will live tomorrow. It's such a pity that not many people understand that.

But the concern went beyond just a question of fairness. One claim common among interviewees was that their basic salary was only enough to live on if they have access to free accommodation, which usually entails living with parents or other family members. Also, many faculty members at the early stages of their career rely on family support to offset their low salaries. Over half the academic staff interviewed felt that their salaries were not sufficient to live on, a view held even more widely among the lower ranks. Indeed, 87% of lecturers said they found it impossible to live on their university income alone (Table 3). A few young lecturers found that their salaries just covered a month's groceries. One recently promoted and newly married professor observed:

> Fifty per cent of the people who work here are young, and we can't afford a home of our own or to get a loan. I have to live with my parents.

Another faculty member claimed:

> It would be impossible to live if we didn't have second jobs.

Moonlighting was reported as a common response to inadequate salaries. One administrator estimated that 80% of all faculty members had recourse to supplemental employment outside the university. This figure was consistent with faculty members' own reports, as 85% of them listed additional sources of income that they rely on, including second jobs and other types of financial support. These concerns, however, received limited attention from administrators; in fact, only a few empathised with the difficulty faced by faculty. The majority of administrators argued that second jobs contribute to

Table 3. **Perceptions of salary sufficiency by academic rank**

It is impossible to live on my faculty salary:		
Rank	Frequency (%)	Total number
Lecturer	14 (87%)	16
Professor	3 (30%)	10
Head of Department	2 (33%)	6
Administrator	0 (0%)	7
Total	19 (49%)	39

academic development by exposing faculty to the "real world" outside the walls of the university.

2. Faculty derive the meaning of their work from teaching but their job security is pegged to research productivity.

Despite the participants' concern about their teaching load, teaching was a top source of job satisfaction for the majority of respondents. When describing the nature of their work, interviewees talked almost exclusively about their instructional activity; they had to be prompted to talk about their involvement in research. When asked to talk about their job satisfaction, 29 of the 39 respondents talked about their students: the joy of seeing comprehension in their eyes, the challenge of responding to their questions and pride in their accomplishments. Two comments capture the teaching ethos evident in the interviews:

> It gives my life meaning to think there are over 1 000 professionals in Ukraine who received some of my heart and instruction.

and

> ... my students are everything to me.

Interviewees emphasised that the majority of people who work at the university are guided by moral rather than financial motivations. It was apparent throughout interviews that the university is characterised by a strong teaching culture and a collective sense of responsibility for nurturing competent and ethical professionals.

While the faculty members' hearts may be in their teaching, job security depends on other things. Interviewees emphasised that their job security depends more on sustained research output than the quality of their teaching. They consistently observed that the pressure to publish is intensified not just by the absence of tenure, but also by the short duration of faculty contracts. Failure to publish carries the perspective of not having one's contract renewed.

The pressure to produce research was magnified by two factors. First, many of the academic staff were keenly aware of the recent drop in college

applicants and feared that the university would need to downsize. One administrator explained that the university has faced increasing competition over the last five years, forcing faculty to work harder to look good in rankings. Over 60% of those interviewed talked about the decrease in student numbers, resulting in some colleagues losing their jobs in recent years. In one department, it had been announced that 40% of academic staff, amounting to 20 professors, would lose their jobs the following year. The result of the employment squeeze for faculty was summarised by one respondent who said:

> The average professor really has to sweat to get his contract prolonged.

Second, for the university to maintain a high level of accreditation, a certain percentage of its academic staff must hold doctoral degrees, and these have a research component. Participants in the study reported that university administration exerted a great deal of pressure on academic staff to obtain further degrees. It was widely recognised that research and publishing, which contribute towards obtaining a degree, are a prerequisite to advancement. Publishing is also interpreted as a signal that a faculty member is seeking to advance his or her academic career.

The strategy adopted by the administration, as expressed by one department head, is to create "green corridors" for people who make progress towards doctoral degrees. The perceptions of faculty, however, were quite different. While they confirmed the existence of strong institutional support for pursuing doctoral degrees, they emphasised the negative aspects of the pressure they experience. These include the constant threat of sanctions for insufficient productivity, pressure from advisors to finish their dissertations as quickly as possible and the utmost difficulty to find the time to do research. Although publishing was seen as basic job insurance, it was an insurance that many found difficult if not impossible to secure. One faculty member claimed:

> I can only devote about 20% of my time to research. I have ideas, but I have other duties that take too much time.

Another complained:

> My contract is for one year, and to have it prolonged I need publications. But what kind of research can you do in a year? ... If I submit a paper in November, it is published in April, and to have my contract renewed I need these papers. It's an unhealthy pressure.

Overall, faculty clearly recognised the squeeze they are in. They view their teaching loads as high and their salaries as inadequate. While under great pressure to do more research, their salaries are pegged to their teaching load, not to research productivity. They understand that the way to maintain and increase salary is through more teaching but that heavy teaching loads leave little time for research.

3. Faculty are pressured to do more research, but not necessarily good research.

The interviews revealed a number of institutional strategies for dealing with the multiple pressures affecting faculty, primarily as it relates to research. Respondents explained that the majority of their research is published in Ukrainian or English language journals published by their own or nearby universities, with virtually no international audience. Since these journals have very limited circulation, they generate little or no income from subscription sales and, consequently, levy a page charge on authors that can run as high as USD 20 per page. To help its own faculty succeed in the push for publications, the university subsidises the page cost for those who publish in its own journals. Administrators viewed this arrangement as an incentive to encourage research and as a fringe benefit encouraging the development of its academic staff. However, standards for accepting manuscripts for publication are low and few readers outside the institution see the work once it is published.

The institutional standards of research productivity have the effect of publicly setting the publication bar high, then lowering it by providing low quality, low visibility journals as outlets for scholarly research. As two faculty members noted:

> It is not worth doing decent research.

and

> Sometimes the research is of good quality, but sometimes very bad. We have a system with points, but you don't get more points if your research is very good.

Some interviewees claimed that the greatest obstacle is not the review process, but the time required and the cost of publication. Around 30% indicated that they do not believe that research done at their university is good or innovative. While these comments represented a minority opinion, they surfaced often enough to suggest a strong undercurrent of dissatisfaction with how research productivity is evaluated and rewarded. Similar opinions were particularly common among faculty engaged in international projects, who observed that research done at their institution is not as rigorous as in partnering countries. One instructor went so far as to estimate that 95% of the scientific work done at his institution does not represent much value. Others commented:

> It is great form, but there is no content or beneficial application. It's done for looks, just like some students study for the looks of a diploma.

and

> Support for research is very poor throughout our entire system.

While crucial to job security, research was not widely cited as a source of job satisfaction. In only a couple of instances did a faculty member's description of their work hold any connotation of knowledge creation. Research productivity was more commonly treated as a symbol of an instructor's personal growth or organisational commitment, not a contribution to the larger society.

Discussion

The findings of this study portray a university caught in a storm of pressures that pit well-established, widely understood and rather traditional institutional goals and procedures against a set of externally imposed changes and political pressures. The institutional effort to respond to external challenges has led to a series of misalignments and tensions that are reshaping how academic staff approach their careers and day-to-day work at the university.

Despite its well-established status and high level of prestige, the institution resorted to the type of "decoupling" of internal and external activities described by Weaver (2008) in which internal institutional structures and actions are not fully aligned with public statements. What results is a series of mixed messages communicated to the academic staff; consequently, external rhetoric about faculty productivity remains in tension with realistic internal work expectations. Our findings also indicate that mixed messages regarding productivity are a central ingredient of a double bind experienced by academic staff at this university. Much like the institution itself, instructors are unable to resolve the ambiguity surrounding what is actually expected of them. While the university cannot question national priorities if it wants to assure continued institutional funding and legitimacy, faculty are prevented from speaking out for fear of losing their jobs. In the end, both institutional and individual actors are obliged to appear responsive to environmental demands in order to survive (Weaver, 2008).

Where internal and external demands clash with the greatest force is in relation to the role of research. Greater pressure to conduct research, reinforced by numerous environmental forces, conflicts with the professional motivations of the majority of faculty, the existing structure of faculty remuneration and the necessity to seek supplemental employment. Increased research output is an extrinsic goal necessitated by the demands of the environment, but is not necessarily consistent with the informal structure of faculty motivations and daily activities. This comes as no surprise given that the structure and culture of universities in Ukraine remain strongly influenced by the Soviet model of higher education, in which universities are oriented towards teaching and research is left to special scientific institutes (Péteri,

2000). After so many years of an exclusive focus on teaching, it is unreasonable to expect academics to quickly embrace research in the same way their colleagues do in the West. The coping strategies of faculty in this study mirror the institutional response: they separate talk from action when it comes to research. Second, the tasks that actually get accomplished tend to reflect the institution's traditional role of instruction.

Most other universities in Ukraine are far less fortunate and less powerful than this flagship institution. They are even more susceptible to the change in governmental agendas, enrolment fluctuations and financial cuts. Their coping strategies are similar to those described above, but probably even more pronounced as the government strives to subscribe to the Bologna Process across its higher education system. While the government and universities expected a transitional period of difficult adjustments, they did not fully anticipate how other external economic and demographic forces would interact with internal changes. Our findings suggest that the transition required for universities to comply with the Bologna Process is often at odds with the traditional role Ukrainian academic staff have typically played within their workplace. At the same time, many universities are facing declining enrolments that translate directly into budget cuts. Universities will struggle to appear responsive to the government's call for reform if they lack the incentives they need to keep academic staff motivated and engaged.

Conclusions

One can criticise the university described in this study for falling into what some might see as a type of hypocrisy, where public statements differ from actual organisational practice (Weaver, 2008), or one can laud its efforts as an adaptive organisational response to contradictory demands. Both responses are justified. Although the systemic inconsistencies have a taxing impact on individual faculty members, they provide an institutional safety valve that allows reform to appear to move forward even as its effects are buffered by less visible actions aimed at stretching resources and modifying expectations.

What seems clear, however, is that the cost of reform falls on individual faculty members and the contradictions of the Ukrainian system of higher education converge in their day-to-day work. The findings of this study suggest that the rhetoric of change may be moving faster than the reality. Such rhetoric, however, comes at a price. Its real cost is measured by the fiscal and psychological strain placed on faculty. For them to appear responsive to such numerous and competing pressures requires a significant investment of their time and resources, but it is an investment that does not bring the same long-term payoff as actual reform. Since academic staff act as gatekeepers of

educational change, their disillusionment with partial and underfunded reform threatens to slow down and possibly undermine the national effort to modernise the higher education system, a point corroborated by Varghese (2004).

Our findings regarding the responses of universities and individual academic staff to externally imposed change are relevant in a growing number of contexts. Efforts toward cross-national harmonisation of higher education systems through the introduction of Bologna-type reforms are being undertaken in Asia, Africa and Latin America (Zgaga, 2006). Around the world, the emergence of the "knowledge economy" has cast knowledge creation as the new dominant rationale for the existence of the university. Systems traditionally oriented towards teaching are facing new pressures, but often their structures are not sufficiently aligned to support high-quality research (Melguizo and Strober, 2007).

As expectations of academic staff change, successful institutional adaptation will depend on an appropriate shift in incentive systems and ongoing faculty development to reduce the complexity of academic work in a changing environment. This study illustrates the pitfalls of increasing demands on faculty without a shift in incentives or sufficient faculty development efforts. Without systemic support, new demands on academic staff will likely clash with traditional incentive structures, producing substandard outcomes while threatening to erode the motivations that led many individuals into the academic profession.

Our findings suggest that in the presence of environmental pressures, a reform that shifts its main costs to faculty without adjusting the institutional support structure will likely elicit counterproductive coping strategies. Underfunded reform runs the risk of creating little more than an appearance of change at the expense of energies that could otherwise be spent much more productively. Higher education leaders would be well advised to give careful attention to the institutional-level dynamics that may accompany such change.

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Notes

1. The terms "faculty" and "academic staff" are used interchangeably to indicate those individuals employed by higher education institutions to deliver instruction and conduct research.
2. To mask the identity of the participating university, the full citation has been withheld.

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Lost in translation: aligning strategies for research in New Zealand

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In New Zealand, the funding of higher education research has been influenced by revised policy-driven imperatives. Amidst the institutional reactions to new criteria for governmental funding, individual academics are being asked to increase their productivity in order for their employing institution to access public funding. For this to occur, these three stakeholders need to have a reasonable understanding of one another's core research objectives and align, as best possible, the strategies they employ to achieve them. This alignment of effort is not without challenges: it may, for example, result in ambivalence as staff resort to behaviours that contest institutional powers over their changing roles and responsibilities. In order to address these challenges, there needs to be further reflection on how the efforts of all parties can be better aligned and collaboratively integrated.

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Traduction infidèle : harmoniser les stratégies de recherche en Nouvelle-Zélande

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En Nouvelle-Zélande, le financement de la recherche universitaire a été influencé par la révision des impératifs politiques. Parmi les réactions institutionnelles aux nouveaux critères de financement du gouvernement, les universitaires sont invités à augmenter leur productivité afin de permettre à leur institution d'accéder à un financement public. Pour ce faire, les trois acteurs concernés doivent avoir une bonne compréhension des objectifs de recherche de base de chacun et harmoniser, du mieux possible, les stratégies employées pour les réaliser. Cet alignement de l'effort n'est pas sans difficultés : il peut, par exemple, engendrer une ambivalence comme le recours du personnel à des comportements qui remettent en cause les pouvoirs institutionnels par rapport à l'évolution de leurs rôles et responsabilités. Afin de relever ces défis, il faut continuer à réfléchir sur la manière dont les efforts de toutes les parties peuvent être mieux alignés et coordonnés.

Introduction

There is increasing interest and debate around the impact of higher education sectoral changes on the individual academic and the fruition of institutional objectives. At a time when policy changes are creating continual and repeated modifications to higher education working and learning conditions, we hear many anecdotal stories of the tension between the revision of institutional directions and academic staff reactions.

This paper examines the theorising that underpins this tension and identifies a number of potential causes and outcomes. It also highlights particular processes that, when carefully designed and enacted, can facilitate more effective working relationships. Our premise is that during change, much depends on clear communication between parties as well as compatible contributions towards shared objectives. If institutional aims and directives are inadequately communicated and understood, there is a danger that much can be "lost in translation" resulting in lowered staff engagement. Lastly, we identify mechanisms that can alleviate misunderstandings and align practices to fulfil a common purpose.

The international higher education research scene has changed significantly over the last two decades, as the focus on advancing knowledge and understanding has become subsumed into a complex arena of research assessment regimes, increased competition for research funding and changed perceptions of what constitutes "research". Governments have been tying research policy and funding to social and economic benefits (with perceived emphasis on the latter: note, for example, Denham [2009] in the United Kingdom), thus strongly influencing the push for research productivity within higher education institutions and by individual academic staff members. This international research policy trend is equally evident in New Zealand (Mapp, 2009).

At the same time, governmental reforms have included new mechanisms for directing and funding educational objectives, pressuring the leaders of institutions to look for new ways to meet revised state expectations. In order to realise these policy directives and expectations, institutions have been forced to adapt. Of necessity, this process has involved change and, in some cases, institutional re-structuring as well as revised policies and procedures. In the context of this changing higher education environment, leaders at all levels are strategising to address "contemporary performance pressures"

(Mintrom, 2008, p. 231). Academic staff within these institutions are, in turn, balancing these new demands for research with those for teaching and service. Since it is acknowledged that one of the significant challenges for organisations is "getting everyone committed to move in the same direction" (Green, 1999, p. 51), in this paper we examine the inter-relationships between the parties and the consequent tensions when research objectives are neither understood nor synchronised.

While universities are repositioning themselves in their changed economic environment, there is a concurrent need to reframe the resourcing and management of their organisation's academic research. Since the output of academic researchers affects the nation's research productivity, it is salient to identify the optimal employment and environmental conditions to realise enhanced outcomes (Madden, 2009). Furthermore, it is important that the values and objectives of all parties are fully understood (Winter, 2009). Since government policy shapes the sector in which universities operate, it will inevitably influence the broader context for organisational identity. Universities, however, are slow to change and tend to retain certain organisational cultures that are internalised by their staff (Mintrom, 2008). Therefore, how the university strategises to address changed policy and seeks to convey its purpose via its management infrastructure will inevitably influence staff engagement. Consequently, we also examine how the transparency and strength of these linkages impact on eventual outcomes and the likely realisation of policy objectives.

Significant changes to the research environment have been occurring on an international level in reaction to an increase in managerial accountability (Deem, 1998). This is evident in the New Zealand context, resulting in "relegating or repositioning individuals within their institutional contexts and reconstructing the nature of their academic work" (Codd, 2005), including the requirement for increased research productivity. Taking New Zealand as our place of reference, we examine the level of congruence between more recent national policies for higher education in this country and organisational and individual responses. Our intention is to highlight how the practices of these three parties, namely the government, the institution and the individual academic, do not always reflect a common purpose. What matters to academics may not coincide with how their employing organisation sees fit to execute governmental policies. In addition, when institutions respond to governmental directives, unless these imperatives exhibit relevant sectoral goals which are clearly articulated, meanings may become obfuscated and the translation of objectives confused. This misalignment of understandings may result in unintended outcomes, some of which are identified here. It is also apparent that this situation can affect individual staff. In a previous research study which examined the effect of a newly introduced research assessment

regime on staff identity, Billot (2010) noted that revised expectations can impact heavily on the professional roles and responsibilities of academic staff.

One form of institutional strategising to invigorate the academic environment is an increased focus on stimulating a research culture, which is now becoming a priority for the research agenda, as noted in the United Kingdom (Deem and Lucas, 2007). New frameworks are being constructed to develop supportive and dynamic contexts for research. The effect of these strategies does not remain at the national and institutional level, for any move to increase research capacity and productivity will automatically impact on individual academics. How well then, in the New Zealand context, do national, institutional and individual objectives and activities perform in concert? How much does ambiguity (Piderit, 2000) between, and indifference towards, the objectives of the three parties get in the way of a collective endeavour? As academics who have participated in efforts within an institution to co-ordinate and harmonise these three separate, yet interlinked entities and their objectives, we question whether policy goals can be realised without a smoother dovetailing of targets and endeavours. While we retain a level of scepticism that **full** alignment can occur, we side with Kaplan and Norton's (2006) view that alignment has the potential to unlock unrealised value from enterprise synergies. In so doing, we aim to contribute to the current discourse on the alignment of strategies. More particularly, while higher education teaching and research are strongly connected, we focus here on *research* in higher education, particularly in emerging research-active institutions.

Kaplan and Norton (2006), in their extensive studies of organisational development and change, have observed that uncoordinated efforts can result in "conflicts, lost opportunities and diminished performance". We echo that premise by suggesting that alignment is not a binary concept (alignment or non-alignment), but it exists along a continuum of synergies and co-ordination. Since non-alignment can cause concern through a lack of comfort and reduced performance (Green, 1999), it is clearly counter-productive. Therefore we contend that a move towards fuller alignment (acknowledging that this complete alignment is an unlikely outcome in practice) offers the potential for greater effectiveness and staff engagement. While organisations have restructured to address the external call for efficiency, in doing so, both intended and unintended outcomes may result, given that any activity at national and institutional level will obviously impact on the individual academic staff member. Since the implementation of national objectives involves translation at the level of the institution, we believe that it is imperative to examine this translation and the degree of correspondence between the vision and objectives of all parties in the sector.

National context and background

A note about terminology: while this paper is concerned with **higher education** research, in New Zealand terminology "higher education" is subsumed within the formal term "tertiary". The latter encompasses all post-secondary education and therefore includes "higher education". We will attempt to use each term appropriately and restrict the use of the term "tertiary" to occasions that reflect its use in New Zealand.

In order to contextualise the topic focus we first describe the tertiary sector in New Zealand, which is being challenged to adapt to a paradigm shift of educational values. Arguably the two most significant policy changes affecting research in New Zealand tertiary education in the last 20 years have been the 1990 amendments to the Education Act 1989 and the introduction of the Performance-Based Research Fund (PBRF) in 2003. The former opened the door for non-universities to offer degree and postgraduate programmes and paved the way for the bulk funding of institutions based on enrolled students, including – significantly – a research component. The latter removed this research component from bulk funding and reallocated it through the PBRF as a new means of measuring and funding research in tertiary institutions.

The 1990 amendment to the Education Act 1989 changed the face of New Zealand tertiary education. It provided a legislated means for non-universities to offer degrees, and linked research and teaching for universities and other institutions engaged in more advanced learning by requiring that "their research and teaching are closely interdependent and most of their teaching is done by people who are active in advancing knowledge" (Education Act 1989, Section 162.4a). All institutions offering degrees therefore needed to develop their own research agendas and while this was "business as usual" for the established universities, it was new territory for non-universities. Throughout the 1990s, all institutions offering degrees received research top-ups within their bulk grants according to the number of students enrolled in degree and postgraduate programmes. While research productivity remained a cornerstone of university development, this was a new phenomenon for the non-universities and the development of a research culture within the latter became a matter of pride rather than audit. Significantly, there was no direct evaluative link between the research funding received by an institution and the research undertaken by that institution.

It was during this period of very rapid expansion and growth in tertiary participation that some non-universities began to envisage becoming universities. Once this dream became enshrined in strategic intent, the research agendas of these institutions became high priority and they sought to be more like their university counterparts (Codling and Meek, 2006). Overall, in the tertiary sector, research still remained essentially self-referential, in

that universities and other institutions undertaking research referenced their progress against their previous year's performance, rather than some external benchmark. For individual staff, research remained an essential activity for the serious university academic, with the dictum "publish or perish" (Smith, 2005a) central to their career path. For staff in institutions new to research, their research activity was, at least initially, self-motivated and conducted largely in the absence of institutional support and understanding.

This environment changed dramatically with the advent of the PBRF, which was established with the primary goal "to ensure that excellent research in the tertiary sector is encouraged and rewarded" (Tertiary Education Commission, 2008, p. 3). With the introduction of the PBRF, institutions' research became assessed, rated and funded according to prescribed research performance. The PBRF regime requires certain processes. Eligible staff are required to submit evidence portfolios which have three components: research outputs (70% weighting), peer esteem (15% weighting) and contribution to the research environment (15% weighting). An overall rating is applied to each portfolio which attracts a differentiated financial return to the institution. Institutional participation in the PBRF was optional, but essential for any tertiary institution which was serious about research and wished to be funded for this research. The first PBRF quality evaluation was reported in 2003, and a second partial round was reported in 2006. The next full round is scheduled for 2012.

Two very clear messages are evident from the design and implementation of the PBRF. First, that the research performance of an institution is inexorably connected to income generation; second, that this research performance is primarily determined by measuring individual staff outputs (which are essentially composed of publications). While peer esteem and contribution to the research environment are identified as important parts of the evidence portfolios of eligible staff, these dimensions are often afterthoughts compared with the drive to boost publications. Arguably, then, there has been a subtle shift from a focus on **research** to a focus on **publication**, and the " publish or perish" mantra of the traditional university academic has now become the imperative of the research-engaged institution. In other words, the quality objective of the PBRF has become a quantity objective for institutions and therefore for their staff.

A third major change for New Zealand's tertiary institutions, resulting from the PBRF, has been the advent of research performance league tables for these institutions (Smith, 2005b). These are published in newspapers such as the *New Zealand Herald* and are based narrowly on data extracted from the published PBRF outcomes. These tables have become of somewhat extravagant interest to institutions for their reputational impact. The desire to be New Zealand's number one research institution, however inappropriate the

measuring device, is intense amongst leading universities. Just as intense is the desire for research-active non-universities to demonstrate that in specialist areas, their research is as good as, if not better than, that of their established university colleagues.

All of this has resulted in an unspoken shift in institutional expectations: academic staff who are teaching at degree level are expected to develop evidence portfolios that will result in a rating (and therefore a financial return to the institution) or scale down their involvement in degree teaching so that they no longer qualify as "eligible" staff. Research also becomes, subtly, a competitive endeavour, with individual academics looking to secure their own evidence portfolios at the possible expense of collaborative research. Rarely, it seems, in this brave new research world, is there sufficient space to consider the relevance and application of research to teaching and learning. There has been an overall shift from the pure ideals of a research agenda dedicated to adding to the body of knowledge, supporting teaching at degree and postgraduate level and the pursuit of a spirit of enquiry amongst the academic community, to a focus on a financial return for the institution, the ranking of the institution on media-driven league tables, and the personal careers and promotion prospects of individual academics.

Institutional responses

Institutional reactions to governmental and fiscal imperatives and constraints have required an evaluation of the organisational culture and a consequent move to build a contemporary research profile. How the institution manages to translate the policy-based directives into a strategic plan depends upon their organisational character and established objectives. The implementation of change may occur at the organisational level or more commonly be devolved through faculty and department/school-based strategies. Whatever the mechanism, it is noticeable within New Zealand tertiary institutions that the workplace has been altered through increased managerialism and bureaucracy, as noted in Australia (Debowski, 2007) and in the United Kingdom (Deem, 1998), in an effort to facilitate increased accountability.

Research-active institutions are, indeed, in a bind. They are, appropriately, committed to research, but a primary driver for research has become the PBRF assessment and the income that flows from it. To maximise this income, institutions are raising publication targets for individual staff. This in turn is requiring more time that comes at the expense of either teaching and learning or service. Ironically, with all institutions raising their research performance in the hope of increasing their PBRF income and

standing, unless the pool of available funds increases, institutions' financial returns from this increased effort will not significantly change.

As prior PBRF assessment panel members, Kane *et al.* (2005) note that the staff assessment portfolios are challenging to compile and attention needs to be focused on evidence that indicates quality of research performance. Increased individual research performance therefore lifts institutional performance and increases funding to the institution. Crucial to this search for increased institutional performance is a need to develop a working culture that is more productive. This institutional focus has been seen as crucial for the survival of many higher education providers in western jurisdictions, especially amongst new and emerging universities (Hazelkorn, 2005). In recent times there has been more exploration as to what comprises such a research context, particularly through the strengthening of research capacity and capability (Deem and Lucas, 2007). Ironically, Brunetto and Farr-Wharton (2005) have noted that educational institutions conventionally use a "process approach to manage systems and structures and implement incremental changes", whereas it is leadership, organisational culture, resourcing and reward practices that influence the most positive academic responses. Furthermore, Madden (2009) has observed that providing a supportive environment would "ensure the right combination of recognition and reward" (p. 281). Research cultures need to be flexible enough to adjust to changing policy requirements, yet remain supportive for staff engagement and productivity. As workplaces are "atypical" (Lee and Boyd, 2003, p. 199), environmental structures and processes need to be part of contextualised practices and as the individual staff member is positioned within the heart of this context, so the circumstances of their workplace require careful institutional planning.

Green (1999) believes that there are varied ways in which organisations can attain organisational alignment where everyone works towards common objectives. Personal alignment occurs when the institution assists individuals to identify how their own objectives overlap with those of their employing organisation and this involves effective dialogue between both parties. Structural alignment involves linking the organisation's identity with human resource processes that clarify how every staff member fits into the bigger picture (*idem*). The combination of both of these alignment strategies provides the context for enhanced collaborative performance and is facilitated through participation by individuals as they "see how their actions relate to their institution's identity" (Green, 1999, p. xiv).

There are conflicting perceptions of how well institutions are managing changes to their organisation. Since the academic community is made up of diverse disciplines and individuals comprising varied "communit(ies) of scholars" (Harris, 2005, p. 424) and there is no longer a **single** academic

profession (Nixon, 1996), it is likely that there will be disparities between individual and institutional objectives and actions. As individuals, academics prefer a sense of belonging, either through accepting the temptation to align and identify with disciplinary silos (Macfarlane, 2006), or being part of sub-cultures (Viitanen and Piirainen, 2003). Academics tend to have less affinity with the institution as a collective body, compared to their commitment to their own discipline. Therefore, as an institution moves to implement national directives, how it conceptualises and implements organisational change is crucial.

If academics do not feel supported in their working environment, resentment against institutional leaders can build and it may appear that senior management is only interested in meeting government-imposed key performance indicators. This behaviour is exemplified at the level of interaction with research staff by "dividing and ruling staff in an environment of resource constraints" (Winter, 2009, p. 126). Winter ascribes this type of conduct to some academic managers (those occupying a professional position in the higher education hierarchy) who may use their power and authority in discourses that alienate and disenfranchise certain academics. An example of this within the research sphere is when, in adopting PBRF terminology, individual staff members are referred to as being "research inactive", even though they may be engaged in research, but do not quite reach the PBRF threshold for being "research active". In order to retain and attract research-active staff to the institution, the executive needs to ensure that efforts to enhance productivity do not fuel competition between staff, creating an environment of distrust and unpleasant working conditions (Mintrom, 2008). Effective modes of communication and consultation can alleviate such collegial tensions and engage academics across the organisation to work collaboratively for collective gains.

The individual academic

This section focuses upon the individual academic, the person "in the field" who has primary face-to-face contact with students and links back to their professional discipline. Institutional change is impacting on staff as they strive to manage often conflicting roles and responsibilities.

The role of the individual academic comprises both professional responsibility and academic contribution. Academics teach, assess and develop improved teaching practices; they manage academic responsibilities and, in many cases, undertake a multitude of administrative and service functions. In addition, individual academics are expected to undertake research, develop national and international linkages, access external funding, contribute to the institutional and extra-institutional research

environment, as well as have their research performance regularly assessed within an external funding context. Such multi-tasking has in the past been largely accepted by academics as being part of academia, although the type of expectations has more recently changed. While Lee and Boyd (2003, p. 189) believe that research is now the "normal" work of an academic, there is, more recently, renewed pressure to enhance teaching portfolios, leading to a conflict of priorities (Debowski, 2007). Such tensions pose threats and opportunities to academic staff since roles and responsibilities are subject to continual review and revision (Lee and Boyd, 2003).

Institutional changes, then, can affect an academic's identity or "sense of self" since there is constant fluidity of identity in relation to contextual changes and alterations to roles and responsibilities may even cause academic staff to have multiple interpretations of who they are (Churchman, 2006). Such experiences present contradictions and compromises which Stronach *et al*. (2002) believe can cause tension between how academics view the ecologies of practice (one's own beliefs and practices which have developed during work over time) and the economy of their performance (how professionals are assessed and evaluated). Where there appears to be a mismatch of professional expectations, academics are querying the changes that now contest their prior assumptions of the composition of the academic environment (Silver, 2003). Where there are increasing demands on individual performance, employees' expectations of their employing institution may, in turn, increase. They are less willing to be excluded from the decisions on organisational change and expect the institutional executive body to take more cognisance of providing supportive structures and processes. Since the individual sense of worth and identity have a significant effect on the effectiveness of workplace positioning (Billot, 2010), it is more conducive if academics and institutions work in concert (Harris, 2005).

Trowler (1998) offers a useful categorisation of responses that individuals may have during a period of change. Unquestioned compliance with the change or "sinking" is the first category, often occurring without any voiced dissent about deteriorating conditions. The second category is "swimming" when conscious acceptance occurs and actions mirror that acceptance. Third, staff may use coping strategies to manage the changes, while the fourth category implies staff rebellion or manipulation of the environment to appease disgruntlement. Naturally, as Trowler points out, these categories are not mutually exclusive and an individual may move between them in order to suit the circumstances. Worthington and Hodgson (2005, p. 97) would add another behavioural trait, as academics "distance" themselves in order to avoid being made responsible. These frames for examining academic reactions can be useful when identifying how academics react to a changed situation.

When an institution moves to revise research expectations, certain elements of the workplace inevitably alter. This change may be on a relatively large scale through structural reorganisation, or at a more micro level through the departmental allocation of resources or individual employment agreements. Structural changes may involve new and redundant roles and positions, as well as changed lines of authority and management. Changes at the individual level may entail heavier workloads, as teaching is managed alongside research with increased expectations for outputs and/or the acquisition of external funding. So the individual is part of and, at the same time, subject to organisational change. While institutions may re-shape their structure or *modus operandi* in response to national imperatives, academics observe and react to any restructuring and re-visioning that result in them having less control over changes to their working environment. Also, individuals will respond very differently to change, usually as a consequence of their personal values and beliefs. Consequently, the priorities of institutions may clash with the principles held by individuals (Briggs, 2007), particularly when the publicly stated purpose of the institution is to teach students, while the strategy-in-action suggests the primacy of a research agenda. Such a disparity of objectives can cause employer-employee relationships to become stretched, with academics becoming indifferent (Presthus, 1979) or distanced (Worthington and Hodgson, 2005), and retreating to more familiar spaces within their own departments or discipline-specific groups. This action is then a constraint to collective objectives being met and puts pressure on institutional leadership.

Discussion

The relationship between the three identified stakeholders in New Zealand, and in higher education internationally, is complex. Each group will shift its mode of operating when national imperatives create revised landscapes for the provision and funding of education. Providers may respond by identifying a competitive edge as well as addressing the demands of the revised funding regime. Individual academics respond to their institutional demands with varied types of responses. Inevitably tensions arise as all parties reposition themselves. The challenge then is to aim for reasonable alignment of all agencies and practices within a unified direction. In reality, it is more likely that unless national directives are clearly articulated to the institutional executive, multiple interpretations may confuse and undermine the implementation of revised policies. Furthermore, ambiguity may be present in the progression from national policies to institutional responses through to individual reactions. Any lack of clarity will cause further uncertainty and possible ambivalence to addressing directives that may appear to have irrelevant meanings or insufficient resourcing. Whilst

government imperatives are unlikely to be designed to meet with institutional and academic approval, unless a working degree of alignment is apparent, it is even less likely that all parties will engage in a constructive and collaborative endeavour. In the case of institutional funding, the PBRF requirements have affected the balance between an employing institution and the employed academics. A constructive context would be to nest accountability demands within a supportive environment in which there is alignment between espoused and actual support.

In the 2003 film Lost in Translation, two characters meet in a less than familiar context and suffer confusion and misunderstanding. By borrowing from the title of this film, we suggest that when the parameters for communication are not shared and the communication itself between all parties does not address this difference, the realisation of objectives may be thwarted through ambiguity and unclear intentions. In the process of interpreting directives, errors of understanding can occur. As with "Chinese whispers", how different parties construe meaning can result in renditions that veer away from original intentions. In addition, where policy directives are less popular, disengagement and indifference can obstruct effective outcomes. Thus it becomes important that actions and objectives work in concert, although alignment of understanding alone may not be enough. We offer some recommendations that may help this to happen.

First, we point to the need for effective change management. While the drivers for change have emerged from more recent governmental directives, there is a potential for inadequate cohesion within the change process. When national structural changes are publicly visible and institutional goals and objectives are openly articulated, individuals are more likely to understand and engage with change requirements. In New Zealand, sector strategy is communicated through the government's Tertiary Education Strategy (TES), while institutional goals are communicated to the Tertiary Education Commission through triennial investment plans that are required to align with the TES. The latter may or may not be well communicated to employees and their realisation is operationalised through various devolved structural and procedural mechanisms. However, there is often less consistency of approach within the institution itself, especially when executive bodies resort to repeated institutional reinventions to address changing external expectations. In many cases, individuals may experience incentives that exist uncomfortably alongside pressures to be accountable and management policies that tie promotion to individual productivity.

At each level of goal and strategy setting, be it national or institutional, there are indications that gaps exist between messages sent and messages received. In other words, to borrow and adapt descriptors from the work of Argyris and Schön (1974) who examined the theory of action, there are

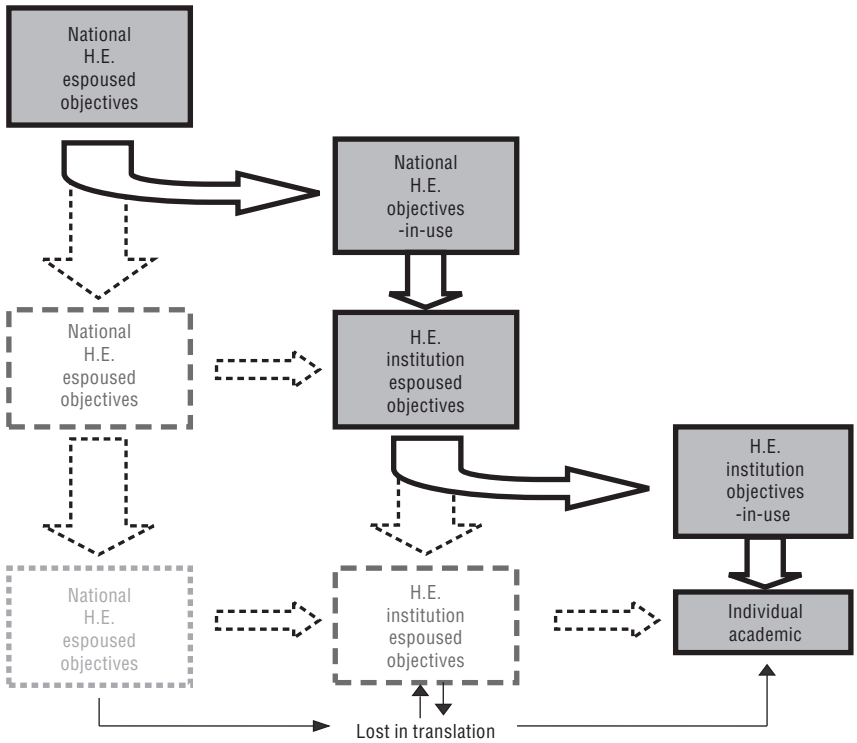
"espoused" objectives and "objectives-in-use". Through their studies, Argyris and Schön found that the theories that people espoused were not the same as the theory that they used. In her critique of their work, Greenwood (1993) explained further that "espoused theories are theories of action to which practitioners claim allegiance and which they communicate deliberately to others; in contrast, theories-in-use are the theories which actually govern and issue in practice". Here, we have deliberately re-framed those terms to refer to the failure for organisational and management practices to resonate clearly with what the organisation advocates. So, in this context, we identify **espoused** objectives as those objectives that an organisation **says** it will achieve and which are usually documented in some form. Objectives-in-use, on the other hand, are what the organisation is **perceived to be seeking** to achieve from its own actions. The smaller the differential between these two aspects of purpose, the more likely that all parties can work collectively.

For the state, the espoused objective of the PBRF is one of encouraging and rewarding research excellence in New Zealand. However, the state's objectives-in-use have the PBRF perceived as a funding mechanism that requires institutions to regularly increase their research performance to prevent a loss of research funding from the state. In addition, individual research outputs are assessed by quality and quantity. It has been observed anecdotally that, within some institutions, research outputs tend to rise in the period leading up to the assessment date, after which they decrease. In other words, staff comply with achieving outputs demanded by external requirements rather than professional and academic needs. At the organisational level, institutions articulate goals encouraging research to support teaching and institutional development, while staff perceive institutional objectives-in-use to be focused on generating more publications and greater research income without allocated time or resourcing. In this regard, Mintrom (2008, p. 234) identifies the need for the institution to develop effective processes for **transforming** research inputs (such as staff endeavours) into increased research quality and research productivity. In order to achieve this outcome, he suggests the creation of an "organisational climate in which research activity is continually exciting" and appropriately supported.

The relationship between the initial espoused objectives of national policy and the institutional objectives-in-use perceived by the individual academic are illustrated in Figure 1.

The potential for the national message to be "lost in translation" by the time it reaches the ear of the staff member is amplified at each step by the extent of the dislocation between espoused objectives and objectives-in-use. For example, although the espoused national objective of the new research agenda in New Zealand is one of encouraging and funding excellent research

Figure 1. **Lost in translation: the cumulative dislocation between espoused objectives and objectives-in-use**



(Tertiary Education Commission, 2008), the objective-in-use is seen as one of maximising research productivity for economic gain while minimising growth in higher education expenditure. At an institutional level, the espoused objective may be one of supporting a quality research environment and enhancing the research reputation of the institution, while the objective-in-use is perceived as one of seeking to increase staff research productivity through increased publications without increasing the resources to support this endeavour.

At each stage, perceptions of objectives-in-use are commonly accompanied by cynicism. However, while the institution is bound to state objectives (regardless of the way these are perceived) because they are so tightly attached to funding, individuals within an organisation can, to some extent, withdraw from active engagement in institutional research objectives by redirecting their energy into other academic activity. In this sense they comply with Presthus' (1979) notion of the "indifferent" and, if this group of

staff grows in number, we suggest that an institution's grip on its objectives becomes more tenuous.

In this context, individual academics are questioning their trust in both national and institutional governance (McNay, 2007). Pratt (1998) has already observed that if there is a lack of congruence and complementarity between individuals and their institutions, identifying and working collectively with shared values is likely to be contested. Henkel (2005) noted through her research in the United Kingdom that when research policies are followed at both the national and institutional level, individual academics begin to question their professional identity. At one level they are advised that undertaking research is valuable, but at the same time they are feeling coerced into obtaining research funding in order to fulfil institutional expectations (Billot, 2010). In addition, academics are aggrieved at how avenues of promotion and tenure are being tied to both the quality and the quantity of research outputs, as well as the generation of external funds (Leslie, 2003). Thus the identity of academic professionals is shifting in response to changing roles and responsibilities established by the academics' own institutional and professional community.

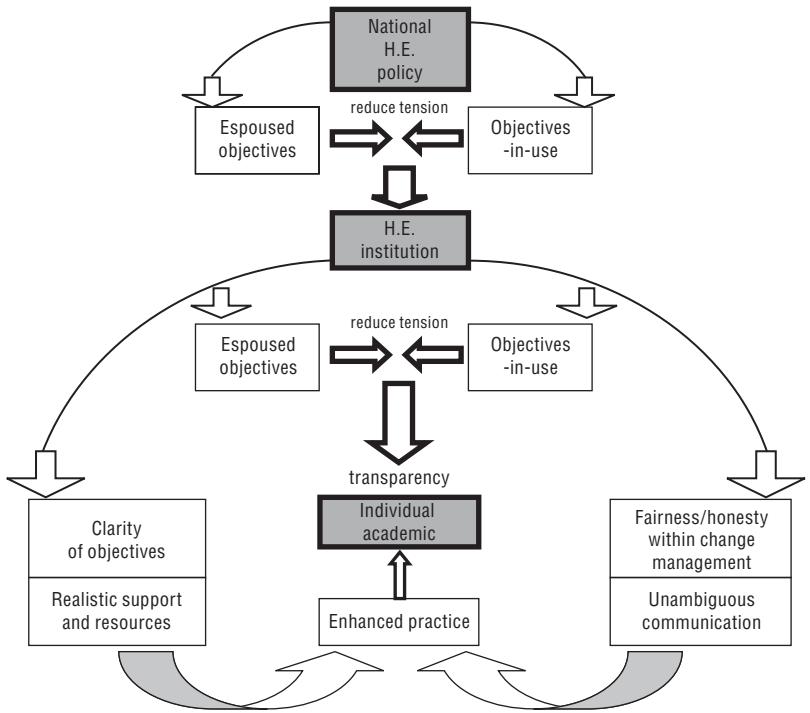
While this paper does not seek to examine processes for organisational change, the underlying issues associated with change practices are fundamental to effective outcomes. Rather than setting out to identify the specific elements of managing change, we have explored the alignment of practice between the three sets of stakeholders, namely, national, institutional and individual parties. It appears to be a significant challenge to all parties to achieve reasonable alignment of governmental, institutional and individual expectations. In fact, it is likely that no one party will take responsibility for this integration. Academics appreciate collegiality, academic freedom and collaboration, especially with management (Winter, 2009), so where there is less constancy of these expectations – such as when interactions between national policy and institutional responses destabilise traditional roles – the result can be insecurity or, as Silver (2003, p. 162) noted, even "bitterness". Management of staff insecurity, therefore, is an integral part of managing institutional change, yet there is a possible inadequate connection made between the change to the organisation and the follow-on effect to individual staff members. In addition, since individuals' behaviour is guided by their perceptions and experiences (Thornton and Jaeger, 2007), staff members need to have their voice heard and acknowledged. These circumstances inevitably have implications for leadership.

In order to provide some support for negotiating the leadership terrain, we identify here some relevant components of practice that might act as cornerstones for strategy implementation and effective research productivity. Since national policy drives the subsequent reactions by institutions and

individuals, tension can be reduced when espoused objectives resonate more clearly with those objectives that are put into action. When this resonance exists, there is a clearer environment in which the institution can take up the directives and operate positively.

At the institutional level, not only do espoused objectives and objectives-in-use need to resonate and provide transparency for institutional strategy, but the institution also needs to address fundamental issues of fairness, honesty, communications and support to embed the changes this strategy requires. Figure 2 illustrates these components which, when used collectively, can promote a research environment that encourages staff engagement.

Figure 2. **A model for the translation of government policy into effective individual practice**



Transparency of both national and institutional purpose needs to be clearly linked to strategies for objectives-in-use. Where espoused objectives and actions do not resonate, tensions can arise, reducing the positive understandings and connections between parties. Channels of communication need to be accessible and content of communication should echo the changed management directives and practices. In addition, the

institution needs to develop a supportive research environment with espoused support being reflected by actual support mechanisms and resources. If it appears that the institutional focus on research productivity remains at the level of "production" there is a missed opportunity to enhance output while also harvesting the motivation, creativity and ability of academic staff. Also, if staff perceive that they are viewed purely as a **unit** of production, their engagement will lack an energised response. Therefore, the perception of how an institution values its academic staff is crucial. If the institutional identity is collectively advanced it is more likely that academics will view the entity and its objectives as "us" and "ours" rather than "it" which will in turn avoid a potential professional divide between the academic manager and the managed academic (Winter, 2009).

Conclusion

In this paper we have utilised some of the issues that underpin the future development of higher education research, using the New Zealand experience as our primary source of illustration, while recognising that this illustration is applicable to other international contexts. We have concentrated on how the stakeholders relate to each other and the consequences of misalignment of expectations and practice. Fruitful interactions are more likely to result in positive outcomes for all, avoiding further erosion of the traditionally accepted notion of academic autonomy and capability (Harris, 2005). Certainly, alignment of mission and performance remains a challenging objective and has significant implications for organisational leadership. It is time for greater reflection on the reshaping of the higher education enterprise. Institutions are unwieldy to steer, yet greater caution and attention needs to be given to any planned change since it involves people as well as processes. As Mintrom (2008, p. 240) pointed out, "organisational culture and staff morale matter greatly". It is crucial that staff perceptions of institutional objectives-in-use are the same as, or very nearly the same as, the institution's espoused objectives. Transparency and openness in communication are fundamental to this.

As Gumport (2001) noted, there are compelling reasons for prioritising integrity: poor decisions of communication and resourcing can result in stratification of who and what matters. This paper has, we trust, laid a foundation for further discussion and will stimulate debate on the issues that affect how higher education research is funded and produced, as well as the significant implications for research leadership.

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Comparing higher education reforms in Finland and Portugal: different contexts, same solutions?

by
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This article provides a comparative analysis of recent governance reforms in both Finnish and Portuguese higher education institutions (HEIs), following the OECD's recent reviews of both countries' tertiary education systems. While in the case of Finland the major problem was identified as being a lack of entrepreneurialism, Portugal was considered to lack effective, strategic higher education planning as well as innovative, flexible and responsive HEIs. The review teams pointed to common issues, despite different country contexts. As they recommended very similar solutions for reforming the legal status of universities, this encouraged national governments to undertake reforms according to their specific needs. By pinpointing problems, the OECD was seen to play an important role in this process and its recommendations proved to be close to the ideas of new public management.

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Comparaison des réformes de l'enseignement supérieur en Finlande et au Portugal : contextes différents, solutions identiques ?

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Cet article présente une analyse comparative des récentes réformes de gouvernance dans les établissements d'enseignement supérieur finlandais et portugais, et fait suite aux derniers examens de l'OCDE sur les systèmes d'enseignement supérieur des deux pays. Alors qu'en Finlande le manque d'entreprenariat a été identifié comme problème principal, la déficience d'une planification stratégique efficace, innovatrice et flexible des établissements d'enseignement supérieur pèse sur le Portugal. Les équipes responsables des examens ont souligné des problèmes communs en dépit de contextes nationaux différents. Elles ont préconisé des solutions très similaires afin de réformer le statut juridique des universités, ce qui a encouragé les gouvernements nationaux à entreprendre des réformes en fonction de leurs besoins spécifiques. Dans ce processus, l'OCDE s'est vue jouer un rôle important dans l'identification des problèmes et ses recommandations se sont révélées être proches des idées de la nouvelle gestion publique.

"Travelling" problems?

This article analyses how national higher education legislation is reformed and, subsequent to the OECD's recent reviews of both Finland's and Portugal's tertiary education systems (respectively OECD, 2009; OECD, 2007), the role of the OECD in this process. To shed more light on the question we examine recent reforms in both countries' higher education systems. When compared, they provide a natural "laboratory" for a case study. There are four reasons for this: first, Portugal and Finland differ in terms of their historical, geographical, cultural and economic characteristics; this enables them to be clearly contrasted. Second, both countries have recently undertaken somewhat similar higher education legislative reforms, which make the comparison more focused and the cases relevant. Third, both countries were assessed by OECD country review teams and this has enabled us to analyse the role played by the Organisation. Fourth, although the international economic status of each country differs, the Finnish and Portuguese higher education systems are similar enough to allow comparisons.

During much of the 1990s, economic growth in Portugal was above the European Union (EU) average but developments in the 2000s led to a situation whereby it is now receiving support from the IMF and the European Financial Stability Facility and is undergoing drastic budget cuts. As for Finland, it has been described by a major online business information service as one of the EU's best performing economies whose "… banks and financial markets avoided the worst of the global financial crisis" (*EUbusiness*, 2011). Such stark differences raise the question: why have there been such similar higher education reforms in these distant, disparate corners of the EU?

Concepts like "globalisation" or "Europeanisation" offer an easy explanation of the similarities of their national contexts but this has been justifiably criticised (Pereyra, 2008; Enders, 2004), for these terms often overlook the importance of local factors and actors (Altbach, 2004; Deem, 2001). This point has been addressed in higher education comparative research: "The first pitfall common to many higher education discussions concerns the assumption that all national systems of higher education are experiencing the same changes and at the same pace. A related issue concerns the mistake of assuming that the language we use to discuss higher education management means the same thing in different national contexts" (Meek, 2003).

Any attempt to analyse whether the "national" or the "global" context is more dominant is an acknowledgement that a contention exists between these two levels. This kind of debate can actually lead away from the important question of analysing their interrelations. One solution to this challenge facing comparative research is to focus on the politicisation of problems.

When comparing the two countries, we draw on traditional comparative education literature which suggests that policies rarely travel. Indeed, as Nóvoa and Yariv-Mashal (2003) point out, understanding time and space is one of the keys to avoiding the most common pitfalls in research. This includes understanding history through different topical problems raised at a certain point in time (*problematisation*) (*ibid.*). This forms the central dynamics of the "travelling" problems which are scrutinised by comparative research. When problems are introduced into a national context from elsewhere they seem to fit in surprisingly easily, or as Popkewitz (2005) puts it: "particular ideas as modes of living are brought into new contexts in which the "foreignness" of the ideas are seen as indigenous or ahistorical and "natural" to that situation in which they are positioned".

In this paper we discuss problems that have been raised in the different historical contexts of Finland and Portugal. Henry *et al.* (2001) consider that the OECD is capable of forming a discursive framework for national higher education policy; we will pursue these ideas and investigate the role of the OECD as central in identifying problems in a national context.

We acknowledge that describing the OECD as an entity is perhaps simplistic. For example, the final results of OECD country reviews "depend … on the people in charge; who is in charge at the OECD Secretariat, who are the selected experts/consultants, who looks after the final draft, and finally, the dynamics of combination of these three parties" (Kallo, 2009, p. 76). However, it is reasonable to argue that as an organisation, the OECD has a certain *modus operandi* and an "institutional memory" (Kallo, 2009). This influences the type of questions the Organisation poses and the focus of its country reviews.

To illustrate how the OECD pinpoints problems in a national context, we need to dig deeper into the research that has been done on Finnish and Portuguese higher education. Having compared Finnish and English systems, Kallo (2009) found that OECD country reviews are used somewhat instrumentally to legitimate national purposes. However, she leaves the door open for future research by asking whether the Finnish system "converges according to foreign models" or whether it is playing "a kind of 'local game on global rules'" (2009, p. 373). On the other hand, Niukko (2006) sees the OECD's analysis as feeding a dogmatic discourse in Finland. According to her, this discourse is not perceived to be at cross-purposes with the OECD's role given that it is consultative, which

minimises any criticism of the OECD. We support this position and believe that OECD reviews have helped national actors to adapt to the global rules of the game.

Teixeira *et al.* (2003, p. 199) conclude that the OECD and World Bank have been stressing the role of the economy in Portuguese higher education for decades. However, national decision-making levels do not simply absorb guidance of this kind: "Governments also seem to use them [recommendations] with considerable discretion, accepting certain policies, ignoring others, even rejecting altogether the international organisation's recommendations. In fact, both institutions were somehow used to legitimise and give credibility to certain national government policy options" (Teixeira, 2003, p. 201). While governments are sovereign, earlier research points out that international organisations have a certain amount of soft power.

Hence, Teixeira *et al.* (in the case of Portugal) and Kallo (in the case of Finland) both identify the same methods among national actors such as creating, legitimising or ignoring impetuses for national reforms. Consequently, these authors have begun to ask whether national decision-making levels are using international organisations to bring forth their own agendas (Teixeira *et al.*, 2003, p. 202). In the case of Portugal, the OECD has argued that higher education should be viewed from an economic perspective. Although reactions have varied, at least the Organisation has been able to raise questions about the national agenda and this has had repercussions on national policy.

According to previous studies, one of the main messages put forward by the OECD since the 1990s has been the notion of new public management (NPM) (Temmes, 1998; Barzelay, 2001; Furubo and Sandahl, 2002). However, there is no clear consensus in the literature as to what NPM actually means. For the purposes of our argument we will not propose a specific definition of NPM but rather outline two of its general principles (Rinne *et al.*, 2007). First, NPM can be considered as doctrinal (Lähdesmäki, 2003; Hood and Jackson, 1991). This means that it has "normative-like principles that seek to convey how public administration could be improved" (Lähdesmäki, 2003, p. 11). Hence, by its very nature, NPM is normative. Second, the normative aspect of NPM can be seen in the dynamics of the private and public sectors. According to the ideas of NPM, private sector practices should be adopted by the public sector, and public sector tasks should be re-allocated to the private sector (Rinne *et al.*, 2007; Temmes, 1998, pp. 441-442; Lane, 1997). Amaral and Neave (2009a, p. 94) go a step further. They claim that "the OECD contributes directly to disseminating neo-liberalism not only by showing that the doctrine works, but that it is an appropriate framework within which plausible solutions may be sought, identified and acted upon".

Given that the OECD plays a key role in identifying various national problems and that NPM is a doctrinal solution, this raises an important question: does the OECD identify problems that can only be answered by the normative doctrines of NPM? Consequently, the research questions underlying this article are as follows: first, what impact have the OECD country reviews had on recent legislative reforms in Finland and Portugal? Second, what kind of problems have the OECD reviews identified in these reforms? In order to answer these questions, we need to take a closer look at the following case studies.

Portugal: a symbiosis with the World Bank and the OECD

Over the last four decades Portugal has let itself be guided by international organisations; however, this guidance naturally serves the country's interests, and should be understood in the light of its history. In order to understand its current higher education system it is therefore important to recall the effects of the 1974 non-violent revolution, which ousted the dictatorial regime. It paved the way for important changes and the country went through a period of normalisation until 1986, when the country joined the EU (Amaral *et al.*, 2007, p. 313). This represents a turning point in the history of the Portuguese higher education sector: it contributed to the democratisation of education by enabling what was an elitist system to evolve into one of mass higher education (Amaral and Teixeira, 2000). However, it is important to note that, to a large extent, the sector was only able to expand because of support by the World Bank and the OECD. Indeed, the Portuguese binary system (which comprises universities and polytechnics/vocational educational facilities) was, on the one hand, inspired by the "human capital" theory and, on the other, legitimated by OECD reports and recommendations (Amaral *et al.*, 2007, p. 314).

Although the polytechnic/vocational subsystem was formally established in 1973, the 1974 revolution interrupted its development. It was only in 1977 that this resumed, spurred by the state's desire to become an EU member. During this period, the country was keen to learn from other European countries in order to develop educational quality and gain access to state-of-the-art policies. Consequently, the system was expanded and diversified by the introduction of a binary framework; private institutions were permitted and access policies put in place (Amaral *et al.*, 2007). The then Portuguese government, driven by World Bank recommendations and the EU carrot, made a priority of stabilising the country's economy and giving vocational higher education a central role.

The Portuguese higher education system, like that of Finland, has a binary structure: it counts 133 institutions which are a mix of public, private, concordat and military. However, this structure is complex, as 18 facilities which are

housed within polytechnics are also components of universities (OECD, 2006). There are 15 public universities and almost every region of the country has a university and/or polytechnic (DGES, n.d.). Public universities and public polytechnics are represented by the Council of Rectors of Portuguese Universities (CRUP) and by the Coordinating Council of the Portuguese Polytechnic Institutes (CCISP). Both the Ministry of Education and Science (MEC) and the General Directorate of Higher Education (DGES) are responsible for higher education and science policy.

The university system in Portugal dates back to the 13th century, but before the establishment of the vocational sector there were only four public universities which explains, to a large extent, the country's low student enrolment rate (Teixeira *et al.*, 2006). The education system in Portugal is regulated by the Education System Act of 1986 (Law 46/86 of 14 October) (Ferreira *et al.*, 2008). Over the years amendments have been made to it resulting in significant changes: for example, the vocational and private subsectors were established and given autonomy and the degree system was redefined (respectively Law 115/97 of September 1997 and Law 49/05 of 30 August 2005).

Throughout the 1990s and 2000s Portugal embraced NPM ideology and practice. By questioning the efficiency of traditional public services, managerialism also questioned the established role of HEIs (Santiago and Carvalho, 2004). There are several key factors which explain managerialist trends in the country. These relate to pressure to change the way in which knowledge, training and education are provided; the difficulty for the bureaucratic-professional model to manage a mass higher education system; the decrease in the number of students coupled with economic stringency; changes in regulation strategies and state control; and finally neo-liberal policies developed by the government which was elected in 2002 (*ibid.*, p. 432). It is generally asserted that NPM represents a more rational way of governance "which combines economic, social and political aspects, using rational choice as the legitimating principle" (*ibid.*, p. 429).

In 2006 – on the request of the government – the OECD and the European Network of Quality Assurance in Higher Education (ENQA) conducted an extensive review of the Portuguese higher education system. Its objective was to propose reforms and adopt the European guidelines approved in the context of the Bologna process. The review recommended that the institutional organisation and legal status of universities should be reformed: "The new legislation should establish institutions as self-governing foundations. Still supported financially by government, they would operate within the private sector. They would have managerial freedom and finances separately accounted for outside the state system. The civil service designation would be removed from all employees of the higher education institutions" (OECD, 2007, p. 141).

The Bill (*i.e.* draft law) (Government of Portugal, 2007) presented the national reform as an unprecedented opportunity for HEIs which would take place in parallel with the modernisation of knowledge societies. Subsequently, and in line with the OECD's recommendations, the government approved the RJIES (Regime Jurídico das Instituições de Ensino Superior), which became the new legal regime for HEIs. This law (62/2007) thus aligns the statutes relative to public and private institutions, universities and polytechnics. It updates legislation concerning public and private universities' and polytechnics' autonomy, as well as the legal regime governing higher education quality and development.

The RJIES was adopted despite pressure to amend it (all opposition parties voted against it) and the disapproval of the National Council of Education (CNE), the Council of Rectors of Portuguese Universities (CRUP) and the polytechnics' co-ordinating council (CCISP), faculty (professors) and staff unions, as well as student organisations and the HEIs. It did contain some positive aspects, which were recognised by the academic community and national unions; these relate to the law which provides for fairer quality assurance in higher education, and it has since been extended to both public and private institutions. Nevertheless, despite all the pressure to change the law, the principles embodied in the RJIES, which were clearly influenced by NPM, were approved. Those who opposed the law argued that it was motivated by a privatisation agenda and that it carried the risk of submitting to private interests. Some feared that by reducing the representation of students and staff in management and governance bodies, the RJIES may foster inequalities in institutions which choose to become public foundations. Furthermore, and as in the case of Finland, since the higher education sector is regulated now by private sector logic (*i.e.* state funding has dropped and universities need to generate a larger proportion of their income), these actors foresee a significant reduction in academic endeavour as well as lower participation in democratic governance by researchers, students and staff. They also anticipate an excessive concentration of power in universities' General Councils and in sole proprietorship positions, *i.e.* university rectors and directors of polytechnics. In fact, when they become foundations, faculties or universities cross the border from the public sphere to the private, namely with respect to financial and personnel management. These institutions are free to borrow money, set salaries, establish careers and define their own criteria for admitting students.

A key change brought about by this legislation relates to the governance bodies of the institutions which opt to become foundations: they are to be governed by a government-appointed board of trustees (Conselho de Curadores). Rectors used to be elected by the university assembly and are now elected by secret ballot by the General Council. This modification does not change the

rector's basic functions as the law stipulates that s/he be the General Council's senior official. The Council is composed of 15-35 persons, depending on the size of each institution and the number of schools and research units within it.

Furthermore, university senates, which used to be the governing body, lost power and in some cases disappeared: instead of having four organs (the rector, the rector's team, the university assembly and the administrative council), sometimes universities were left with only three, in which case the university assembly was replaced by a smaller general council. The major difference now, and something which has been strongly contested, is that in addition to academic and student representatives, 30% of members of the General Council should consist of individuals who do not belong to the institution (Law 62/2007, Article 81). Although the statutes may provide for the creation of an academic senate consisting of representatives of the organisational units, this body has no deliberative power.

Administrative councils have also been replaced by management boards which have identical functions, *i.e.* they are responsible for the administrative and financial management of the institution, as well as human resources management (Law 62/2007, Article 95).

Those who contest the RJIES also believe that the status of foundations could lead to an even greater reduction of state funding on the grounds that universities are able to sustain themselves. Therefore they fear a full liberalisation scenario, meaning that the amount of tuition fees for all studies would be fixed, combined with the deregulation of employment conditions for teachers, researchers and other workers: a situation which would undermine professional autonomy, and academic and intellectual freedom in particular. This scenario is quite likely to occur, given that the amount of money allocated in the state budget to HEIs is not attributed in function of the number of students enrolled. What we are seeing now is pluri-annual contracts based on "performance indicators" which span not less than three years, *i.e.* funds are defined according to the objectives to be reached (Law 62/2007, Article 136). Furthermore, the OECD recommendations in this sense are clear: "Tuition charges should be increased significantly, in order to help provide additional resources to the institutions and to acknowledge the significant positive financial advantages that a higher education qualification confers on graduates throughout their working life" (OECD, 2007, p. 4).

The recent legislative reforms in Portuguese higher education are therefore very much in step with international trends. On the whole, the country has followed the OECD's recommendations, just as – in the past – it adhered to the World Bank's guidance. Thus it seems fair to say that, historically, the country has sought international support in order to legitimise the government's decisions.

Finland: legitimising reform with the help of the OECD

Finland has 16 universities, 6 regional university centres and 25 polytechnics (Finnish Ministry of Education and Culture, 2011). After being part of Sweden and, as of the early 19th century, an archduchy of the Russian Federation, Finland became an independent nation in 1917. The first university was founded in Turku in 1640 and during Russian rule it was transferred to the new capital, Helsinki. After the civil war in 1918 and the Second World War, Finland became one of the most robust European economies and built a typical Nordic welfare state (Esping-Andersen, 1990). Roughly speaking, as in Portugal, the development of Finland's higher education system went through three phases. Until the mid-1900s only Turku and Helsinki had universities and, on the whole, higher education was reserved for the elite. However, the rapid expansion of Finnish higher education in the 1960s ended this era, and the new thinking meant that higher education became linked with regional politics and associated with the drive to make sure that the whole country remained progressive (Kivinen *et al.*, 1993, pp. 192-195; Rinne, 2010). During this expansionary period, which ran from the 1960s to the 1980s, the government attempted to locate universities evenly throughout the country. Furthermore, university regulations were revised and the power previously held by professors was distributed more democratically (Kivinen *et al.*, 1993; Autio, 1993). The new system introduced representation quotas for three groups: professors, other staff and students; these quotas affected all levels of governance, i.*e.* departmental, faculty and university.

Finland was scarcely engaged in international relations before the 1990s, but it still has a record of "riding the OECD slipstream" (Kauko and Varjo, 2008, p. 228) in policies relating to education. As Kallo (2009, p. 368) concludes in her thorough research, "OECD country and thematic reviews have regularly preceded legislative reforms of the national higher education system from the 1980s until the present day." Although the OECD link was established before the fall of the Soviet Union in 1991, connections with the West were still modest. The fact that the Ministry of Education's internationalisation strategy of 1987 had no effect before the early 1990s amply illustrates this. At that time, internationalisation was boosted by the economic crisis (Nokkala, 2007; Välimaa, 2010, 2011). Two important reforms of the Finnish higher education system – and which were catalysed by the OECD – were approved: the first related to managerial reform. Second, a decision was taken in the mid-1990s to create a binary system by establishing polytechnics (*ammattikorkeakoulu*) (Rinne *et al.*, 2004; Kauko, 2011). Finland became a member of the European Union in 1995 and has been described as a "model pupil" (Naumanen and Rinne, 2008, p. 362). Another step in the direction of European co-operation was Finland's EU presidency in 1999, which coincided with the signing of the pan-European Bologna Declaration. Overall, Finland has been not only

amenable to the recommendations of the EU and OECD, but also active in putting forward and disseminating the ideas emanating from these bodies (Naumanen and Rinne, 2008, pp. 362-363).

At the same time as Finnish higher education opened up to wider cohorts, another phase began with the NPM reforms of the late 1980s and early 1990s (Hölttä and Rekilä, 2003; Salminen, 2003). A change in doctrine meant that the central idea in politics was no longer social planning but rather addressing external economic disturbances (Kivinen *et al*., 1993, pp. 143, 194-195; Lampinen, 2003, p. 83). As part of NPM efforts to enhance the economic efficiency of higher education, the concept of "structural development" was introduced in 2006 in order to form larger units by combining institutions, while avoiding overlaps by dismantling old structures (Rinne *et al*., 2007). In the higher education system, the most visible part of this development has been known as "management by results". According to Summa (1995, pp. 144-148), Finnish management by results in this context has been spurred by officials rather than politicians; she concludes by stating that managerial predictability is impossible in politics. Rekilä (2006, p. 229) expands on this position and maintains that since officers are driving for results, the Ministry of Finance is forcing the Ministry of Education into a mould, along with the other state sectors, without taking account of the specificities of universities.

Many changes brought about by recent legislative reform had their roots in the 1990s. Välimaa (2010) describes the trajectories of this period as "a globalisation shock" which had profound consequences on the development of the Finnish higher education system. Following this shock, Finnish higher education policy became more closely linked to economic aims, and at the same time reforms (*e.g*. Law 645/1997) gave universities more autonomy (Välimaa, 2011). This development culminated in the new Universities Act (Law 558/2009 of 24 July 2009) which brought about two major changes: universities became independent legal entities and their governance was reformed. But despite the fact that universities were able to raise other funding more efficiently, the state remained the main source of funding (Välimaa, 2010, 2011; Aarrevaara *et al*., 2009).

The new law was drawn up over 2008-09, and during this process the OECD (2009) published a country review of Finland. The conclusions of the review team were reminiscent of NPM style *par excellence*. The problems they identified were attributed to bureaucratic bottlenecks and a lack of entrepreneurialism (*ibid*., pp. 57-58). Hence, in relation to universities there were "pressures for more autonomy" in order to "become more entrepreneurial" (*ibid*., pp. 105-106). To help achieve this, the OECD (*ibid*., p. 133) discreetly offered "recommendations", "reflections" and "suggestions" (*ibid*., pp. 108, 116). For instance, it suggested a new legal status for universities:

> "It seems very appropriate to redefine the HEI[s] (both polytechnics and universities) as so-called "Legal persons", rather than as civil servant units. Within this approach, there are alternatives for institutions:
>
> - As non-profit corporations.
> - As foundations". (*ibid*., p. 108)

There were also similar trends at the national level. The OECD review team (*ibid*., p. 58) directly referred to the fact that the Ministry of Education and Culture and the Rectors' Conferences of HEIs supported enhanced autonomy. More work was done by a two-member committee, which the OECD team (*ibid*., p. 110) was unaware of. The committee's recommendation, which reflected the same tendencies as we have seen above, was to reform the legal status of universities so that they could become private foundations or corporations under public law (Opetusministeriö, 2007).

The government bill for the new university law made reference to the two-member committee and noted that international comparisons did not support the universities' old "accounting office" model. There was also a reference to the Science and Innovation Council (Government of Finland, 2009, pp. 29-30) which is an influential policy-making body. As Kallo (2009, p. 370) has pointed out, the bill had a rather peculiar approach with regards to the OECD recommendation. Initially it states that the recommendation to reform the legal status of universities was "appropriate" (Government Bill 7/2009, p. 28), but later the tone changes when the Organisation was said to consider the reform a "necessity" (Kallo, 2009, pp. 298, 370; Government Bill 7/2009, p. 29).

Subsequent to the developments described above, the bill applied the OECD recommendations and proposed a model which went on to change universities' internal decision-making processes. It suggested that the governing bodies of public universities should be composed essentially of external members and that foundation universities should only have external members (Government of Finland, 2009). This suggestion became a contentious issue among academia and in parliament, and was overruled by the Parliamentary Committee for Constitutional Law (Parliamentary Committee, 2009, pp. 3-4), responsible for the *ex ante* constitutional evaluation of laws.

Finally, a compromise was found. It was decided that public universities would have a board, a rector and a university collegiate body. The highest executive organ, the board, now consists of 7 or 9-14 members, of whom at least 40% are external stakeholders, the rest being comprised of professors, other staff and students. None of these three groups can hold more than half of the seats. The composition of the board and its term of office are decided by the collegiate body, which has a maximum of 50 members and includes

representatives of the three groups. The rector is elected by the board and holds the main executive power (Law 558/2009).

In the case of private foundations, the main organs are the board, the rector and an "overall multi-member administrative body". The chair and vice-chair of the seven-member board must be external to the university. The administrative body selects the rest of the board after consulting the founding partners. In addition, three members who are not state representatives must be selected among the appointees suggested by the founding partners. The overall multi-member administrative body is rather similar to the collegiate body of a public university. The rector is elected by the board and has approximately the same executive power as rectors in public universities (Law 558/2009). One of the most significant changes is the re-formulation of the rector's position: whereas earlier s/he was elected by the university community, now the rector is more or less a chief executive officer responsible to the board (Välimaa, 2010).

The end result of the Universities Act was certainly consistent with international trends, but then again the national situation was complex. However, the OECD has been largely presented as an external source of pressure and as a justification for reforming universities' legal status. The so-called reform proposals regarding the legislative status of universities became one more argument used by the government as a whole and the Ministry of Education and Culture, in particular, to legitimise the reforms.

Different contexts but similar conclusions

The origins of reforms in Portugal and Finland differ greatly, although historically their higher education systems have certain similarities. From early on Portugal sought international support in order to legitimise many of its decisions. It began by working with the World Bank, then the OECD, the European Association for Quality Assurance in Higher Education (ENQA) and the EU. This engagement, which took place with different momentum and through different instruments, enabled Portugal to devote significant political effort to align itself with other European models. More recent manifestations of this were the signing of the Bologna Declaration in 1999 and the formation of the RJIES in 2007. A somewhat similar logic also prevailed in Finland after the fall of the Soviet regime and during and after the globalisation shock of the 1990s. A "Europeanisation journey" commenced there as well, and the OECD also played an important role early in the process. One can therefore affirm that both systems were open to feedback from international agencies.

The OECD identified different problems within the two systems. While in the Finnish case the main one was seen as a lack of entrepreneurialism, Portugal was considered to be lacking effective formal strategic higher education planning as well as innovative, flexible and responsive HEIs, which are needed to increase

quality. However, in each case the OECD's tone was very different. Finland received discreet hints, but in the case of Portugal the OECD's recommendations, such as the creation of a new National Council responsible for overall higher education strategy, were much more direct. The objective was to redefine the relationship between certain institutions and government in order to free them from overly complicated administrative procedures (OECD, 2007).

The OECD review teams' responses analysed in this article fit rather well the description of NPM we have coined: promoting private sector practices within HEIs. Hence it is fair to say that international prescriptions contributed to the general acceptance of a managerialist ideology in both Portugal and Finland.

In both cases, very different situations led to similar suggestions by the two OECD review teams. As they posed the same type of questions in both countries, it is not surprising that the two governments drew the same conclusion: the legal status and governance of the universities had to be redefined. In both Finland and Portugal this led to contentious measures in terms of institutional governance (*e.g.* increased management and stronger leadership were advocated) and human resources practices (*e.g.* HEI staff members are now considered to be university employees and no longer civil servants). Earlier on, the OECD was a catalyst in the creation of the binary structure in both systems.

However, Finland's non-existing tuition fees were not politicised whereas in Portugal the OECD team suggested increasing them. Could it be that Portugal, with a weaker economic situation than Finland, was more desirous of such suggestions? We believe that governments' decisions should be viewed from the perspective of the historical situation at the time. It is not surprising that in a climate of financial crisis, and considering the inertia of earlier NPM reforms, the Portuguese government received the suggestion of increasing tuition fees with interest.

In sum, the latest legislative reforms of both higher education systems absorbed and applied the NPM edicts quite well. While the national circumstances were different, the OECD response in both cases was characteristic of NPM. This makes us wonder whether the OECD review teams supported NPM reforms not for reasons of logic, but rather of doctrine. Another possibility is that a consideration of the global environment in which HEIs operate pushes nations to seek similar successful solutions or "best practices".

Yet another, distinct possibility is that the OECD serves the purposes of national governments. As we have seen, both countries have used OECD policies essentially as a lever to obtain legitimisation. This would support the thesis of policy making being not so much about finding the right solutions, but about finding the right questions that fit pre-determined solutions (Kingdon, 2003).

The OECD certainly functions as an agent of globalisation, as it pinpoints similar problems in different contexts. From the perspective of its reviews, the cases analysed here suggest that a similar type of problem fits all situations. This would support the theoretical idea of "travelling" problems. However, individual nations can use the promoted values in very different ways, according to specific circumstances (Beck, 1999). Governments have different aspirations towards ideal outcomes and they look at their counterparts' programmes when searching for the best practices to achieve these aspirations. The reason for the similar reforms in the cases covered here would seem to be tied to national decisions, but the OECD has served as a vehicle for teasing out the "right" problem.

Another interesting question is whether these two small countries at the farthest corners of the EU need to be more open to input from international organisations. In any event, Finland and Portugal have shared the experience of opening up to the rest of the continent and, for both of them, a strong catalyst was the will to belong to something mythical and inclusive: Europe.

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