ROYAL ACADEMY OF ENGINEERING

Does teaching advance your academic career?

Perspectives of promotion procedures in UK higher education

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Image courtesy of UCL Engineering

Does teaching advance your academic career?

Perspectives of promotion procedures in UK higher education

A report for the Royal Academy of Engineering Standing Committee for Education and Training

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Foreword

Building an academic career in any subject means balancing the demands of teaching with research opportunities. The student experience in higher education, particularly in a vocational subject such as engineering, speaks volumes to the teaching excellence of the many academics who dedicate their time to improving the quality of their teaching. However, when it comes to recognising those who prioritise an excellent learning experience for their students, there is a question of whether they are provided with the same opportunities for career progression as their research-focused colleagues.

The international reputation of UK higher education institutions has tended to rely on the quality of their research outputs. However, the landscape is shifting and more emphasis is being placed on student experience and employment outcomes, as measured by the National Student Survey and the Key Information Set. There is no doubt that all academics recognise the importance of high quality teaching as part of their career. However, this research questions whether universities are recognising the value of teaching in their promotions procedures for academics. This report by Dr Ruth Graham shows there is a clear difference in perceptions on the value placed on teaching in promotions procedures in engineering between lecturers and senior leaders in universities.

As this report states, engineering academics that excel in teaching need to be championed through academic promotion procedures. Improving the transparency of promotion decisions, incentivising department heads to endorse promotion cases with a strong teaching element, and developing a set of measures on teaching-based promotions should lead to a robust promotions process that properly values high quality teaching.

The Academy is grateful to the author for bringing to light these perspectives on the role that teaching plays in promotions procedures in UK universities. I look forward to the discussion that this insightful report will create among the higher education community.

Professor Helen Atkinson CBE FREng
Chair of the Standing Committee for Education and Training

Executive summary

In any organisation, procedures for identifying and rewarding excellence drive continuing improvements in performance. In recent decades, a compelling case has been made for fundamental reform to undergraduate engineering education, but there is increasing awareness that systemic change will only be possible if the teaching contribution of engineering academics is appropriately recognised in promotion procedures. Very little is currently known, however, about how promotion procedures are perceived by engineering academics and the extent to which teaching achievement is understood to contribute to career advancement.

This report turns the spotlight on this issue. Drawing on survey evidence (n=604) and interview evidence (n=52) captured in 2014, it focuses on perspectives of the university promotion system among the UK engineering academic community.

The study distils views and experiences from various levels of the university hierarchy to address the question, "to what extent are university promotion procedures seen to incentivise teaching achievement in engineering?".

The question is considered in three parts, addressed in turn in the report:

1. To what extent does the engineering academic community perceive that teaching is adequately rewarded in university promotion procedures?

2. What are the challenges associated with rewarding teaching achievement in academic promotions?

3. What can engineering schools and the wider academic community do to ensure that teaching is, and is seen to be, appropriately recognised and rewarded?

The most striking finding of the study, and one that ran through the evidence gathered in response to all three of these questions, was the profound and entrenched differences in perspective between university managers and those engaged in delivering engineering education 'on the ground'. In many cases, these two sets of views were diametrically opposed, with those dedicating time and effort to teaching reporting that they were "left sitting with our hands empty when [the time comes] to be promoted", while those involved in promotions decisions reporting that "the reality is that people who perform well as teachers will get promoted". So, for example, while three quarters (74%) of lecturers and senior lecturers considered that teaching was a "not very important" criterion for promotion to professorship, only a third (34%) of department heads, deans and senior university managers agreed. The divergence of view by seniority can be summarised as follows:

The most striking finding of the study was the profound and entrenched differences in perspective between university managers and those engaged in delivering engineering education 'on the ground'

- **Engineering academics and researchers**: The vast majority of engineering academics and researchers reported that teaching was afforded little or no value in academic promotion procedures. Despite an "increasing rhetoric… from the vice chancellor about how teaching well is now a priority at the university", few reported any career advancement incentives to invest time in teaching activities once a minimum "threshold level for acceptable teaching" had been reached. For many, the only significant changes to the promotion system at their institution had been the introduction of a teaching-focused career track for teaching and learning specialists: "universities often talk about improved incentives for good teaching, but in reality they are usually referring to teaching-based promotion, which only covers probably three or four cases a year, across the whole university. The story for the remaining 90% is actually very different".

- **Senior university managers**: The majority of senior university managers reported a marked change in the recognition given to teaching excellence in the promotion process, prompted, to a large extent, by the marketisation of UK higher education and the associated increased public scrutiny of university performance. As a result, contribution to teaching and the quality of the student experience was reported by many to play an increasingly important role in academic promotion decisions, where "excellence in teaching can substitute for some level of excellence in research". Many also noted that there were now "genuine consequences for poor teaching", with individuals whose "teaching is not up to scratch" denied promotion.

University managers may consider that their views of the promotion system are in line with current practice, while those of engineering academics fail to reflect recent changes in the value afforded to teaching by promotions panels and committees. Nonetheless, the negative perceptions of the promotion system among academics appear to be deeply ingrained and, from their perspective, to be evidence-based. These negative perceptions are likely to have negative consequences, reducing the time invested in teaching activities by engineering academics seeking career advancement and, in consequence, the pool of candidates willing to submit a promotion case which emphasises teaching achievement.

The survey and interview evidence made clear, however, that the challenge is not simply one of misplaced perceptions, a barrier that could be addressed by more effective communication. Study participants from all levels of the university hierarchy also pointed to structural barriers that constrain both the weight attributed to teaching in promotion decisions and the likelihood that candidates will emphasise teaching as a basis for career advancement. Six key issues emerged:

1. An overwhelming emphasis on research reputation and income is seen by many to pervade all aspects of university culture, dominating promotion priorities both for career advancement within institutions and for academic mobility nationally and internationally.

2. The measures used to evaluate teaching contribution are seen to be poor indicators of achievement and impact. They are therefore often attributed little weight by candidates when preparing their cases and are perceived to be accorded little weight by promotion boards when evaluating these cases.

3. The difficulties associated with identifying and collecting evidence of international leadership in teaching/education appear to leave many academics struggling to build a robust teaching-based promotion case to professorial level.

4. Some university policies and practices, such as annual appraisal processes, appear to reinforce negative perceptions among academic staff about how teaching is valued, with the result that few prioritise this aspect of their professional role and fewer still apply for teaching-based promotion.

5. For many in the engineering education community, a policy/practice gap is seen to exist, where university policies for recognising and rewarding teaching achievement are not perceived to be consistently followed by promotion boards in practice.

The challenge is not simply one of misplaced perceptions, a barrier that could be addressed by more effective communication

6. University resource allocation models are understood to recognise research quality and student numbers, but not teaching quality. The incentive structures at departmental level therefore do not encourage academic managers and, most importantly, department heads, to invest in cases for promotion based on excellence in teaching rather than in research.

Overall, the study points to the four mechanisms through which to ensure teaching achievement is, and is seen to be, appropriately rewarded in the promotion process. They are presented as recommendations to those in leadership positions in the UK higher education sector in university senior management, higher education funding agencies and the UK Higher Education Academy.

- **Recommendation 1: improve the transparency of promotion decisions.** Placing anonymised data in the public domain that demonstrates the priority placed on teaching achievement in the promotion system could help to shift perceptions and improve practice. For example, universities could provide information on successful promotions based on the respective domains of research, teaching and administration at a level of aggregation to ensure anonymity. The release of annual data demonstrating that teaching excellence was routinely rewarded and poor teaching was not routinely overlooked may challenge perceptions that the promotions process was weighted towards research. In institutions where a significant policy/practice gap exists, and teaching achievement is not routinely rewarded, such transparency may also encourage greater adherence to the written guidance by promotion boards and improve outcomes overall.

- **Recommendation 2: develop a robust set of measures to demonstrate teaching achievement.** The higher education community urgently needs to develop teaching-based promotion measures, with transferability across and between institutions, that better reflect academic achievement and contribution to teaching. The development of such a system would require a community-wide effort. However, a set of measures in which both academic staff and senior managers had confidence has the potential to transform how teaching is recognised and rewarded.

- **Recommendation 3: improve the information and support offered to candidates for teaching-based promotion.** Coherent and ongoing support should be offered to candidates wishing to emphasise teaching achievement within their case for promotion, to help them (i) identify the types of indicators that contribute to a strong case for promotions, and (ii) establish a system by which they are able to collect evidence of their teaching achievements on an ongoing basis.

- **Recommendation 4: realign departmental resource allocations to reflect the quality of teaching.** Universities might consider developing departmental resource allocation systems that recognise and reward high teaching quality, rather than just student intake numbers. Similar to a model developed at Lund University described within the report, such a system may help to incentivise department heads to support, encourage and endorse promotion cases with a strong teaching component.

The study evidence suggests that these four recommendations would enable teaching to be more appropriately and consistently recognised in higher education in a way that is seen and understood by academic staff. Together, they would help to create to a culture where academic staff believe that their teaching contribution will be rewarded, and provide them with transparent, robust processes through which to demonstrate these achievements. Evidence from the study suggests that many in the higher education community are eager to see such reforms carried through in practice, and signs of change are already evident in UK universities. The engineering community is well-positioned to take a lead in this transformation. With teaching excellence integrated into the promotions process, engineering education in the UK would be equipped to provide world-leading programmes that prepare graduates for the engineering challenges of the 21st century.

The study evidence suggests that these four recommendations would enable teaching to be more appropriately and consistently recognised in higher education in a way that is seen and understood by academic staff

1. Introduction

In any organisation, procedures for identifying and rewarding excellence drive improvements and change. In recent decades, a compelling case has been made for fundamental reform to undergraduate engineering education (Royal Academy of Engineering, 2007, National Academy of Engineering, 2004, King, 2008), but there is increasing awareness that systemic change will only be possible if the teaching contribution of engineering academics is appropriately recognised in promotion procedures.

Engineering academics need to believe that their investment of time and expertise in pedagogical reform will be adequately rewarded if engineering schools are to deliver the changes required to maintain the UK's international standing for high-quality engineering education

Concerns have been raised that research performance appears to drive academic promotion, with teaching playing a more marginal role (Soyster, 2008, Fairweather, 2008, Felder & Hadgraft, 2013). Indeed, a recent Royal Academy of Engineering report (Graham, 2012) evaluating the conditions for successful education reform noted that academic rewards procedures, and their apparent bias towards research, "acted as a major deterrent to faculty engaging with or supporting any programme of educational change". There is no doubt that higher educational institutions expect good quality teaching as standard, and that academics will not progress their careers in research if they cannot demonstrate effective teaching. However, engineering academics need to believe that their investment of time and expertise in pedagogical reform will be adequately rewarded if engineering schools are to deliver the changes required to maintain the UK's international standing for high-quality engineering education. However, very little is currently known about how promotion procedures are perceived by engineering academics and how these views might incentivise teaching achievement for the purpose of career advancement.

This report turns the spotlight on this issue, focusing on the views of the academic promotion system among the UK engineering academic community. Through a survey and interviews with members of the community, it seeks to answer the following question, "to what extent are university promotion procedures seen to incentivise teaching achievement in engineering?". The question is considered in three parts, which are each addressed in turn in the three main sections of the report:

1. To what extent does the engineering academic community perceive that teaching is adequately rewarded in university promotion procedures? (Section 2)

2. What are the challenges associated with rewarding teaching achievement in academic promotion? (Section 3)

3. On the basis of the study outcomes, what practical advice can be given to engineering schools and the wider academic community to ensure that teaching is, and is seen to be, appropriately recognised and rewarded? (Section 4)

A two-staged process was used to gather evidence for the study:

- **Online survey (n=604)** of UK-based engineering academics, researchers, teaching fellows, department heads and senior university managers was undertaken to identify perceptions and experiences of how teaching was

rewarded in engineering academic promotions. Information on the questionnaire design, focus, data collection methodology and achieved sample is provided in Appendix A. The survey questionnaire is reproduced in Appendix B.

- **One-to-one interviews (n=52)** explored issues raised in the survey in more depth by selecting individuals with a range of backgrounds (university management, department heads, senior and early-career academics, research staff, etc). A number of interviewees were also drawn from outside the UK, to contrast differences in international practice and highlight international exemplars of well-regarded practice. Information on the interview protocol is provided in Appendix C.

Taken together, the survey and interview responses paint a rich picture of the perceptions and experiences of engineering academic promotions from various levels of the university hierarchy. Specifically, this evidence provides detailed information on the role that teaching is seen to play in career advancement within UK engineering schools and the challenges associated with rewarding teaching within the academic system.

Three points should be noted about this report.

Firstly, the report focuses on the teaching and research (T&R) career pathway. A clear distinction is therefore made throughout the report between T&R academics seeking promotion by 'standard' university progression routes and those individuals (teaching-only staff, teaching-only academics or T&R academics) whose promotion case rests primarily on their contribution to teaching/education. To ensure that the report draws on evidence relating to the standard T&R career track, the survey data presented **exclude** responses from teaching-focused respondents unless otherwise stated. Only where the report focuses specifically on teaching-focused promotion routes (for example in Sections 2.5 and 3.3), has survey data from this group been included.

Secondly, the study focuses on perceptions and experiences of engineering academic promotions from various levels of the university hierarchy; it therefore does not include data from UK universities on promotion policies, procedures or outcomes.

Thirdly, the term 'academic staff' is used to describe all departmental staff employed in teaching and research roles, including postdocs, lecturers, senior lecturers, readers and professors. The term 'senior university managers' is used to describe department heads, deans, university vice-chancellors and deputy vice-chancellors.
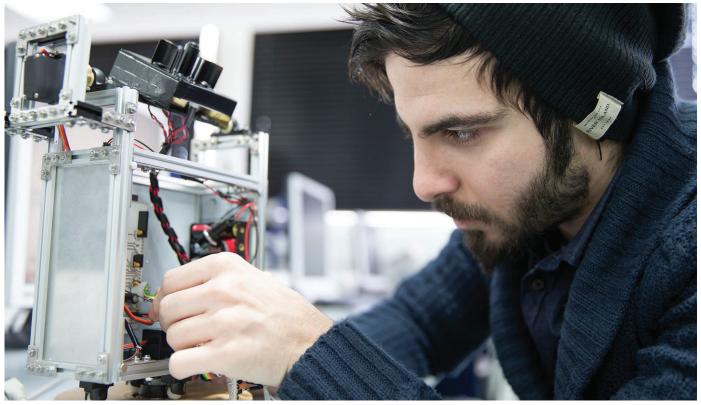

Image courtesy of University of Kent, School of Engineering and Digital Arts

2. Is engineering teaching seen to be adequately rewarded?

This section draws on survey and interview data to explore perceptions of whether and how teaching is rewarded in the engineering academic promotions procedures.

It begins by providing a broad overview of the value perceived to be attached to teaching, looking in particular at the entry into an academic career (first lectureship appointment) and what many regard as the desired end point (promotion to professorship) (Section 2.1). It then looks at how perceptions of the academic promotion system vary by seniority (Section 2.2). Section 2.3 considers views of the teaching-based evaluation criteria and standards used in promotion decisions and Section 2.4 considers whether the value assigned to teaching in academic promotions is likely to change in the future. The final section considers the promotion opportunities that are seen to exist for individuals whose roles focus primarily on teaching/education (Section 2.5).

The survey also indicated that many in the engineering academic community do not perceive teaching to be what one interviewee referred to as a "priority item" in university promotion policies. When asked "how prominent is teaching excellence in your university's promotion policies?", the most popular response was "it is there, but not prominent", selected by 46% of respondents.

A number of interviewees spoke about their personal experiences with the promotion system, both successful and unsuccessful; the prevailing view among both groups was that "teaching just does not get you promotion. Pure and simple". For example, one interviewee described their very recent experiences of having a case for promotion to senior lecturer turned down: "I had been advised in the past by a senior academic to only spend the minimum time on teaching, but I couldn't live with myself if I did that. It's my job… but now I think I need to be more ruthless… It's all very well being the go-to person in the department who takes on the teaching, but they are not going to promote you for it… The people who get promoted are not spreading their time between teaching and research. They are only driven by research".

Some interviewees also expressed surprise and frustration at the "low value assigned to teaching" within promotion procedures, particularly in light of the reliance of many universities on teaching income. The views of this senior lecturer were typical: "… two thirds of the income in our department comes from teaching. Without it, we just wouldn't keep afloat… It amazes me that

Evidence from the survey suggests a widespread perception among UK engineering academics that teaching is undervalued in university promotion and reward procedures

2.1. What value is placed on teaching during selection and promotions?

Evidence from the survey suggests a widespread perception among UK engineering academics that teaching is undervalued in university promotion and rewards procedures. A large majority (75%) of survey respondents reported that "teaching excellence should be better rewarded in promotion than it is at present".

Figure 1. Proportion of survey respondents who reported that each criterion is currently 'very important' in appointment to first lectureship (in blue), and should be 'very important' in appointment to first lectureship (in magenta)

■ is currently very important
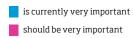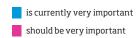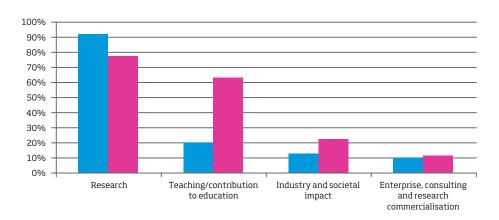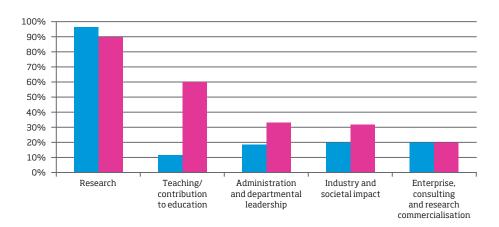■ should be very important

Figure 2. Proportion of respondents who reported that each criterion is 'very important' (in blue) and should be 'very important' (in magenta) in promotion to professorship within their department

■ is currently very important
■ should be very important

[teaching] doesn't feature more in how we promote people". With few perceived extrinsic motivations linked to personal career advancement, many considered teaching achievement to be incentivised by "professionalism, pride and a commitment to our students".

Survey respondents were presented with a selection of promotion criteria and asked to identify (i) the importance currently attributed to each criterion within their own department/institution, and (ii) the importance that they would like to be attributed to each criterion. They were asked to make this assessment for two key milestones in the academic career ladder:

• appointment to first lectureship (broadly equivalent to entering a tenure-track position in the United States (US) academic system);

• promotion to professorship (broadly equivalent to promotion to full professorship, in the US academic system).

The findings are summarised below.
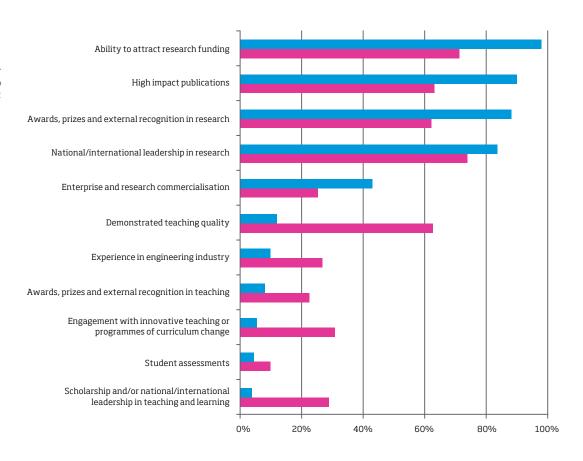
Appointment to first lectureship

There was a marked difference between perceived practice and preferred practice with respect to appointment to first lectureship. As illustrated in Figure 1, while 20% reported teaching or contribution to education to be currently a 'very important' appointment criterion in their department, a significantly higher proportion (63%) would like it to be 'very important'.

In particular, 'communication skills and interest in teaching' was perceived to be the dimension that was most undervalued in the appointment process, with 'experience in engineering industry' also seen to be an appointment criterion that was often overlooked.

As Figure 1 illustrates, research performance is clearly seen to govern entry to an academic career. Indeed, when asked to identify the measures that are most valued by their departments when appointing candidates to first lectureship, two research-based measures dominated the survey responses: "ability to attract research funding" and "high impact publications", as selected by 97% and 94% of respondents respectively. The typical view was: "it is all about their REF[1] papers and their potential for bringing in research

Figure 3. Proportion of survey respondents who reported that each factor *'is most highly valued'* (blue) and *'should be most valued'* (magenta) in promotion to professorship in their department

Ability to attract research funding

High impact publications

Awards, prizes and external recognition in research

National/international leadership in research

Enterprise and research commercialisation

Demonstrated teaching quality

Experience in engineering industry

Awards, prizes and external recognition in teaching

Engagement with innovative teaching or programmes of curriculum change

Student assessments

Scholarship and/or national/international leadership in teaching and learning

■ are most highly valued
■ should be most highly valued

0%   20%   40%   60%   80%   100%

income. These are the only things people are ever appointed on". One interviewee was blunter still: "new hires are seen as cash cows. What you judge a new lecturer on is their ability to bring in money".
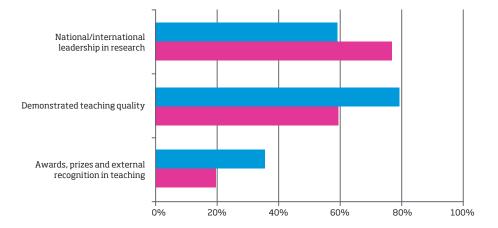
Promotion to full professorship

Further along the academic career trajectory, at promotion to full professorship, there was again a divergence between how the academic community understands teaching to be valued in their department and how they believed it should be valued. The difference was even more marked at this career stage than at appointments to first lectureship. As illustrated in Figure 2, respondents identify research as the overwhelming basis for promotion, with a much lower value assigned to teaching and educational contribution: 97% of respondents reported research to be a 'very important' promotion criterion in their department, compared to 12% for teaching/education.

As detailed in Figure 3, the measures identified by survey respondents as playing the dominant role in promotion priorities were again research-based: "ability to attract research funding", "high

impact publications", "awards, prizes and external recognition in research" and "national/international leadership in research". Teaching-based criteria were reported to play a negligible role in professorial promotions: despite 63% of respondents expressing a preference for "demonstrated teaching quality" to be highly valued in professorial promotions, only 12% reported that it was prioritised within their department. Criteria relating to scholarship or innovation in education were assessed as playing an almost insignificant role: less than 5% reported such activities to be highly valued in the promotion to professorship. Again, the interview data supported the survey findings; research was described as "the overriding consideration in promotion... it is all about research leadership, research income and research rankings. Whatever they say, they don't give a hoot about anything else".

In line with responses relating to appointment to first lectureship, survey data suggested that the academic engineering community would favour research continuing to be the most significant criterion for promotion to professorship (see Figure 2). However, it appears that most would support giving

Figure 4. Proportion of respondents, by gender, reporting that selected evaluation criteria 'should be most valued' in the promotion to professorship

a greater weight to teaching-based promotion criteria (Figure 2), especially those related to teaching practice (Figure 3).

The survey also revealed differences in view by gender, particularly with respect to the promotion priorities that respondents **would like** to see implemented in engineering schools. For example, as illustrated in Figure 4, female academics were significantly more likely than their male counterparts to attach a high value to teaching-based criteria in professorial promotions, such as "awards, prizes and external recognition in teaching" and "demonstrated teaching quality" ($p < 0.05$). Equally, female survey respondents were significantly less likely than their male peers to prefer promotion processes that give high value to research-based criteria, such as "national/international leadership in research" ($p < 0.05$).

Interview feedback suggested that female academics were more likely to carry high teaching loads and therefore suffer disproportionately from the limitations this imposes on career progression. As one engineering dean commented, "with [promotion] metrics weighted towards research output, you have to have a long and sustained career with continued citations to meet the benchmark. If you have taken a career break [with young children], you will have a gap and the system does not cope well". Many interviewees noted that, in consequence, "women often sublimate teaching for research, but find that their career plateaus… the only path open to them for promotion is to move to a teaching-track and that is looked down upon". A number of female interviewees, many of whom had been unsuccessful in their attempts to be promoted above lecturer or senior lecture level, expressed keen frustration with what was described

as a "career dead-end". The views of this lecturer were typical: "everyone pats you on the back and tells you what a great job you are doing with taking on so much teaching and getting such good feedback scores, but you are left sitting with your hands empty when [the time comes] to be promoted".
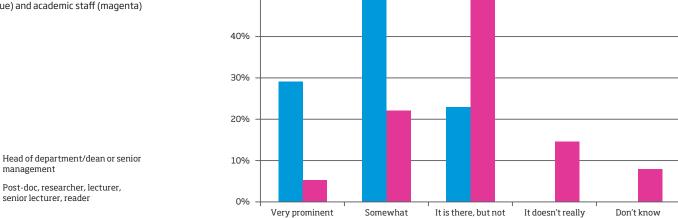
2.2. How do perceptions vary by seniority?

One of the most striking findings from the survey and the interviews was the difference in views between academic staff and those in managerial positions, at departmental, school and university level. Across all levels, there was a broad agreement that teaching **should be** valued and rewarded in academic promotions. Where the differences emerged, however, was in the assessment of how teaching **is** valued within their institutions.

Senior university managers, deans and department heads tended to describe a system where "the reality is that people who perform well as teachers will get promoted". In contrast, academic staff (post-doctoral researchers, research fellows, lecturers, teaching fellows, senior lecturers/readers) typically reported that "teaching is a second-tier activity when it comes to promotion". These differences are captured in Figure 5, which indicates that those at an early stage of their careers were significantly more likely than senior managers to report that teaching did not feature in institutional policies for academic reward. Among senior respondents, 77% reported teaching excellence to be 'very prominent' or 'somewhat prominent' in the promotion policies at their university,

Figure 5. Responses to the question *"How prominent is teaching excellence in your university's promotion policies?"*, for heads of department, deans and university managers (blue) and academic staff (magenta)
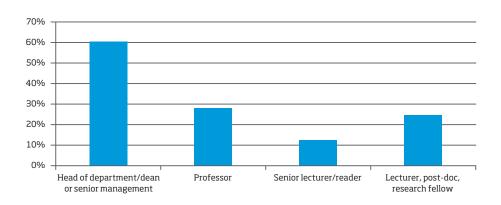
■ Head of department/dean or senior management

■ Post-doc, researcher, lecturer, senior lecturer, reader

Figure 6. Survey respondents agreeing with the statement *'teaching excellence is valued for all academic roles that include any teaching'* at their university, by respondent grade

compared to 27% of academic staff. Indeed, almost two thirds (65%) of academic staff reported either teaching 'is there, but not prominent' or 'it doesn't really feature'. As this suggests, dedicating time to improving the curriculum, teaching delivery or the quality of the students' experience are not seen to be career-advancing activities. Indeed, when asked, "thinking about your own career progression, how much incentive is there from your department to devote time to developing your teaching practice?", two thirds (67%) of academic staff (senior lecturers, lecturers, readers, postdocs and researchers) reported there to be 'none' or 'very little'.

It is interesting to note that, although a significant attitudinal divide is apparent between university management and academic staff, the single group most likely to report a low value assigned to teaching within their institution is senior lecturers/readers. This group was five times less likely than those in senior management positions to report that 'teaching excellence is

valued for all academic roles that involve teaching' during university promotion procedures, as illustrated in Figure 6. Interview feedback from senior lecturers and readers suggested that many in this group were very cynical about university claims of valuing teaching during promotion procedures: "unlike younger staff, we have an institutional memory and we are well aware of who gets promoted and who does not. It is down to research and I don't think this will ever really change".

Many interviewees recognised the divergence in perspective between senior managers and academic staff. However, each group attributed it to a different cause.

Representatives of **senior university management** often commented that department-based academics were disconnected from university-level processes and priorities and were therefore unaware of the growing weight being attached to teaching in rewards

procedures. Some went further and suggested that a "toxic culture" existed in many departments, where "a lot of young academics are poorly advised about what secures promotion" which had also "become an easy way for people to justify not being promoted".

Academic staff, on the other hand, often appeared to be cynical about the value attached to teaching by universities, suggesting that, although senior managers were "obliged to toe the party line", it was seen as a "hand-waving" exercise with very little substance behind it. Others also pointed to confusion about the significance of institutional changes in promotions procedures with respect to the broad swathe of academic staff. Although many acknowledged that universities had "moved a long way" in creating new career pathways for teaching and learning specialists, these structural changes were reported to have had little influence on how teaching was valued in the promotion of T&R academics. The comments of this senior lecturer are typical of many: "universities often talk about improved incentives for good teaching, but, in reality they are usually referring to [specialist] teaching-based promotion, which only covers probably three or four cases a year, across the whole university. The story for the remaining 90% is actually very different".

2.3. How is teaching achievement evaluated during promotions?

Interviewees were asked to describe the measures and processes used to evaluate teaching achievement at their university during 'standard' T&R promotions. Again, their responses suggested a marked difference in view by seniority, particularly between department-based academic staff and those with direct experience of university promotion procedures.

Department-based academic staff characterised the consideration of teaching for 'standard' T&R promotion in broadly similar terms. UK universities were seen to adopt a "threshold level for acceptable teaching", which all academics were expected to attain. Interviewees consistently identified electronic student feedback scores as playing the major role in establishing achievement of this minimum threshold, supplemented by data on the volume and nature of teaching undertaken (such as the number of modules delivered or developed). Most interviewees also described one additional qualitative piece of teaching-based evidence that was requested by their institution during

the promotion process, such as a "peer observation of a lecture", a "one-page narrative describing their teaching approach" or delivering "an open lecture within the department, if the candidate was new to teaching".

Teaching achievement beyond the minimum threshold, unless the candidate was following a specialist teaching and learning career pathway, was seen to "add little additional value to your promotion case". It was also noted by many that, unlike research performance, there appeared to be no expectation for teaching achievement to improve or increase with career progression: "once you are above the threshold level, the advice to young academics is that you should put in the minimum effort to stay above the threshold. Everything else should go onto the research side". Overall, the threshold level was widely regarded to "set a very low bar… It is much more about identifying the poor teachers than rewarding the good ones".

School and university managers tended to report evaluation criteria for teaching achievement that were more nuanced and highly-valued than those reported by their junior counterparts. Although most agreed that teaching achievement was typically assessed against a minimum threshold, many spoke at length about the consequences of failure to meet this standard. Such circumstances were described as "triggering a red flag", and would often result in "a block on their promotion until standards could be improved", with exceptions only made where "the candidate was a truly exceptional researcher". For some, this exercise had allowed departments to "weed out the bottom 5% of very poor teachers" in recent years, with "universities becoming more explicit that this is not acceptable". For a number of interviewees, the single biggest change to the teaching component of T&R promotions over the last decade has been this introduction of "genuine consequences for poor teaching". One engineering dean commented, "we now have to have very uncomfortable conversations about why people are not being promoted… because their teaching is not up to scratch".

Around half of interviewees who sat on their institution's promotion panel went further, and indicated that practice within their institutions had "moved beyond" a minimum threshold approach

and "tick-box mentality" to one where "excellence in teaching can substitute for some level of excellence in research". In particular, where candidates were able to demonstrate "true innovation in teaching", as evidenced, for example, by teaching and learning portfolios, pedagogical research, peer testimonials or impact beyond the university, their "chances of getting promoted are measurably improved".

2.4. Is the landscape for rewarding teaching likely to change?

Survey and interview respondents were asked whether the value assigned to teaching by their institution was likely to change in the coming five years.

Almost half of respondents anticipated an increasing prioritisation of teaching at their institution: 44% of survey respondents reported that, in five years time, their university would value teaching more highly than it does currently, with no significant difference in view by seniority. Survey respondents who anticipated this increase in the value of teaching were asked to identify the key factors driving the change. Three drivers dominated their responses:

- *'student data'* (Key Information Set and NSS), identified by 71% of respondents;
- *'student expectations'*, identified by 69% of respondents;
- *'changes in university funding'*, identified by 67% of respondents.

Interviewees spoke at length about how the "free market economy for students" in higher education was poised to make dramatic changes to how universities valued and rewarded teaching, where drivers related to "the increased profit margin from teaching" and "growing public scrutiny" will play a dominant role in setting university teaching agendas. One head of department commented, "as a crude observation, teaching is starting to be valued more highly as there is an increasing nibbling away at the profit margins of research combined with the opening up of the market for students and the direct link between students and income. This is already having an impact on prioritising education".

44% of survey respondents reported that, in five years time, their university would value teaching more highly than it does currently

2.5. What teaching-focused promotion opportunities exist?

While this study is primarily concerned with the 'standard' T&R promotion process, it also sheds light on the opportunities for advancement of teaching-focused staff. This section considers the picture for those in teaching-focused roles (teaching-only staff, teaching-only academics or T&R academics who concentrate on teaching) by drawing on the full range of survey and interview responses, including those from teaching-focused respondents.

Around one in six (17%) of academic staff in UK engineering schools is employed on a teaching-only contract (HESA 2012/13), a group that has grown significantly in recent years. These staff are typically employed on the university's teaching and learning career ladder and the majority are on short-term or fixed contracts.[2] Interview data suggest that a small number of academics employed in 'standard' T&R posts also devote the majority of their time to teaching/education-based activities, although the size of this group cannot be quantified. Over the past decade, an increasing number of UK universities have established new teaching-focused promotion routes, designed to improve the career opportunities for both these groups (Cashmore et al., 2013).

Evidence from the survey and interviews suggests that the increase in teaching-focused posts is broadly seen to have had a positive impact on educational quality in engineering. For example, the majority of survey respondents[3] (62%) reported that "teaching-only posts help to improve the quality of teaching and learning in engineering departments" (see Figure 7). Some interviewees also suggested that teaching-only staff can play an important role in "redressing the research bias" in many departments, through the establishment of "a small group of excellent teachers who are able to devote all of their time to the students". This point is highlighted in a recent Australian report on university teaching (Norton et al, 2013), where teaching-only posts are described as "act[ing] as a circuit-breaker to research dominance".

In addition, when compared to their T&R colleagues, teaching specialists appear to bring much greater levels of industry experience to their role ($p < 0.001$, see Figure 8), suggesting that they may be better placed to contextualise student learning in authentic 'real world' engineering problems. This correlation between industry experience and engagement with teaching is consistent with survey evidence from the US (Fairweather and Paulson, 1996), which revealed that academics in engineering and natural sciences with industry experience were "more likely to spend a greater percentage of their time on [teaching] instruction than their counterparts without experience in industry".

However, survey and interview data also point to highly-polarised views on the status of teaching-focused staff in UK engineering schools and the progression opportunities open to them. As is apparent throughout this report, seniority appears to be a strong predictor of attitudes towards the institutional reward of teaching, and senior respondents were much more likely to take a positive view – that good career advancement opportunities exist for teaching-focused staff – than academic staff.

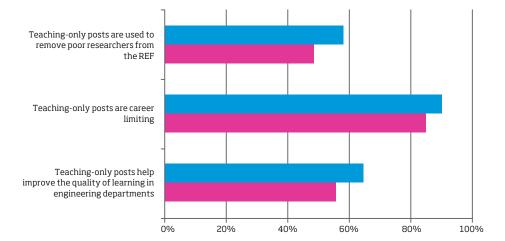Two broad sets of views were expressed, as summarised below.

• Around one quarter of interviewees reported that the introduction and/or enhancement of robust teaching-focused progression routes within their institution had had a transformative effect on "some of our very best teachers", providing status and career advancement opportunities that had previously been unavailable to them. While noting that "it is too early to tell what the overall effect will be, as these people are still moving through the system", many pointed to specific examples of teaching-focused individuals who were "coming out from the shadows" and now advancing to professorial level under these new systems. Many in this group of interviewees, however, also expressed some surprise and concern about the low numbers of candidates applying for promotion on specialist teaching and learning pathways: "HR is satisfied that they have put all of the right procedures

Around one in six (17%) of academic staff in UK engineering schools is employed on a teaching-only contract, a group that has grown significantly in recent years

[2] In 2012/13, 38% of teaching-only and 91% of 'standard' T&R academics were employed on permanent or open-ended contracts (Higher Education Statistics Agency, Staff in Higher Education Institutions, 2012/13).
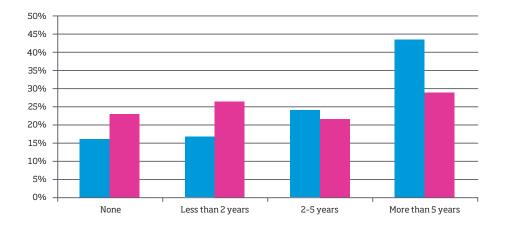
[3] Within Section 2.5, the survey data presented will include the teaching-focused respondents.

Figure 7. Proportion of survey respondents agreeing with the following statements, for teaching-focused respondents (shown in blue) and other respondents (shown in magenta)

■ teaching-focused respondents
■ other respondents

Figure 8. Survey responses to the question *"how much experience do you have working in industry full-time?"* by teaching-focused respondents (in blue) and other respondents (in magenta)
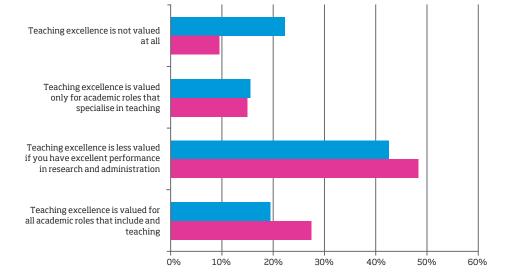
■ teaching-focused respondents
■ other respondents

in place, but just can't understand why no-one is applying". Perhaps as a result of the low number of applicants, many also noted that the proportion of successful candidates for teaching-based promotion was high: "...we only have two promotions per year based on teaching, but this is two out of maybe only three or four applications... Most of them seem to get through".

• A larger group of interviewees expressed some scepticism about teaching-focused promotion routes, suggesting that these progression paths were rarely endorsed and prioritised by their departments. Indeed, the overwhelming majority of survey respondents (87%)[3] reported teaching-focused posts to be "career-limiting" (see Figure 7). For some interviewees, their university's motive for the creation of these posts was research-driven rather than teaching-driven: to "relieve the burden

of teaching from the star researchers" and to "throw our useless research staff into a teaching role". Specifically, some suggested that the emergence of teaching-focused posts was directly linked to the UK government-led research assessment process, where research output is assessed by the number of research-active staff within the department: "too many universities are shifting people across to teaching only as a way of shifting staff off their research returns. It needn't be a career sink, but that is how it is used at many places". Indeed, more than half (53%) of survey respondents overall[3] reported that "teaching-only posts are used to remove poor researchers from the REF". As a result, some reported a perception that teaching-only posts represented a "second-tier, low-status underclass of academic", with departments attaching very low priority to their career progression.

Figure 9. Survey responses to the question "when applying for a promotion at your university, which of the following statements best reflects the value given to teaching excellence", for teaching-focused respondents (shown in blue) and other respondents (shown in magenta)

■ teaching-focused respondents
■ other respondents

Overall, teaching-focused respondents reported a less positive assessment of the career advancement opportunities open to them than their non teaching-only colleagues, with many reporting that "I have no expectation that I will be promoted, ever". So, for example, 92% of teaching-only respondents reported that "teaching excellence should be better rewarded in promotion than it is at present", compared to 75% of other respondents. In addition, as illustrated in Figure 9, 22% of teaching-focused respondents reported that "teaching excellence is not valued at all" in their university's promotions process, compared to 9% for other respondents ($p < 0.05$).

3. What are the barriers to rewarding teaching excellence?

Evidence from both the survey and the interviews pointed to a gap between how the engineering academic community believed that teaching should be rewarded and how they understood it to be rewarded in practice, a gap that was particularly apparent among prospective promotion candidates (see Section 2).

The study also considered the factors that may underlie this gap between preferences and perceived practice.
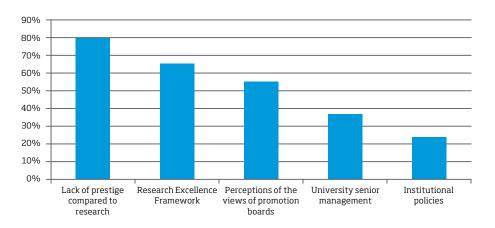
Six issues emerged:

1. An overwhelming emphasis on research reputation and income is seen by many to pervade all aspects of university culture, dominating promotion priorities both for career advancement within institutions and for academic mobility nationally and internationally (see Section 3.1).

2. The measures used to evaluate teaching contribution are seen to be poor indicators of achievement and impact, and are therefore accorded little value by candidates when preparing their cases and by promotion boards in their assessments of these cases (see Section 3.2).

3. The difficulties associated with identifying and collecting evidence of international leadership in teaching/education appear to leave many academics struggling to build a robust teaching-based promotion case to professorial level (see Section 3.3).

4. Some university policies and practices, such as annual appraisal processes, appear to reinforce negative perceptions among academic staff about how teaching is valued, with the result that few prioritise this aspect of their professional role and fewer still apply for teaching-based promotion (see Section 3.4);

5. For many in the engineering education community, a policy/practice gap is seen to exist, where university policies for recognising and rewarding teaching achievement are not perceived to be consistently followed by promotion boards in practice (see Section 3.5).

6. The models used by universities to allocate resources to departments are understood to recognise research performance and student numbers – but not teaching quality. The incentive structures at departmental level therefore do not encourage academic managers and, most importantly, department heads, to invest in cases for promotion based on excellence in teaching (see Section 3.6).

This section explores each challenge in turn. As it makes clear, a high proportion of these challenges are related to the apparent differences in view between senior managers and academic staff.

Figure 10. Top five survey responses to the question "in your opinion, which of the following, if any, are barriers to better rewarding teaching excellence?"

For many, an "implicit research bias" represented the "single biggest reason why teaching is not taken seriously enough" in university reward procedures

3.1. Research-focused departmental cultures and priorities

Survey and interview evidence pointed to a widespread perception that engineering academic culture values "research above all else". For many, this "implicit research bias" represented the "single biggest reason why teaching is not taken seriously enough" in university rewards procedures. Indeed, when asked to identify the most significant barriers to better rewarding teaching, the two dominant responses selected by survey respondents were both research-based: "lack of prestige compared to research" and the "Research Excellence Framework", as selected by 81% and 66% of respondents respectively (Figure 10).

The research-dominant culture was seen to be manifested in a number of ways and, in the words of one post-doctoral researcher, "was clear to me from day one". Many described the difference in status and opportunities afforded to teaching-focused and research-focused staff. Note was made of departments "positioning themselves for the REF by pushing people with weaker research records onto teaching-only contracts", posts "associated with short-term contracts and a big threat to your future career"; a practice described in a recent Australian report (Probert, 2013) as "improv[ing] institutional research rankings by transferring research-inactive staff to a teaching-focused classification in order to reduce the research-active denominator". At the same time, "successful researchers can buy themselves out of teaching, shedding their teaching load onto others. This sends out a message that it is research that matters first and foremost. And these seem to be the people that are on

a fast-track for promotion". Early-career academics often spoke of "valuable advice" they had been given by more experienced colleagues to focus on their research outputs: "early in your career it does you no good at all to get involved in any more teaching than you have to. This is the time where you are most under pressure to teach, but unless you resist... your career will plateau very quickly". Indeed, it would appear that most UK-based engineering academics associate career success with research achievement, with the vast majority (91%) of survey respondents reporting that "research-focused careers tend to be more successful". This feedback is mirrored by the findings of a recent *Nature* report (Sadler and McKinney, 2010) looking at university teaching in science disciplines, which concluded that "although scientists personally value education as much as research, they frequently align their decision making, both for themselves and on behalf of their departments, with the needs of research rather than those of education".

A prevailing culture where "academic status and value is bound to research" was reported to have intensified in recent years: over half (53%) of survey respondents reported that the value placed on research by their university has increased in the past five years. This change was attributed by many interviewees to two interrelated factors:

1. **The international research rankings**: University selection and promotion priorities were seen to focus almost exclusively on "preservation of institutional reputation, as measured by the league tables". International university rankings, most notably the Academic Ranking of World Universities, draw overwhelmingly on research-based metrics with the consideration
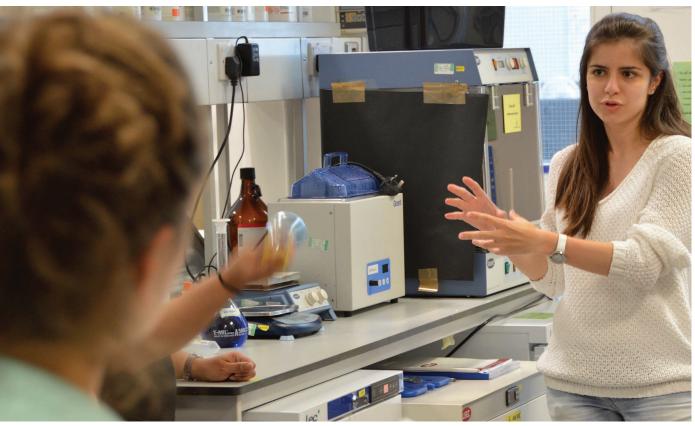
Image courtesy of UCL Engineering

of teaching confined to indicators such as the staff to student ratio. As a result, rankings are perceived to "focus everyone's attention on research. There is nothing comparable in teaching".

2. **Research income**: Research income (sourced via the Research Excellence Framework (REF), research bodies, industry etc.) was described as becoming "progressively more important to the strength of a university". With REF funding increasingly "consolidated on a small super-league of top-performing universities", many reported increased pressure to "create a cadre of people who can compete [with this elite group] on the basis of research and then employ a separate group of people to teach".

Many senior-level interviewees, however, warned against considering the landscape as a "simple issue of teaching versus research… Treating research and teaching as separate categories, in opposition to one another, is not useful". In particular, many spoke of the role of the national and international university rankings in recruiting the best students. As one dean noted, "our student recruitment is driven by our reputation and global positioning,

which, to a very large extent, is determined by our research presence in the rankings". Rankings were seen to play a particularly important role in the recruitment of international students, a group that offered "the biggest profit-making source of income in the university". In consequence, "if you were a department wishing to improve the quality of your [student] intake, you need to ask yourself whether the best way to do that is to improve your teaching quality, or to improve your league table position through improving research outputs. Most, I think, choose the latter". This point was underlined in a recent Australian study on teaching-focused academic appointments (Probert, 2013), which noted that, despite university rankings being "skewed towards research rather than other measures of quality such as the student experience, or even student learning….they are used in major institutional student markets to determine university selection".

As made clear by interview responses, however, practices clearly vary considerably between institutions and departments, and a research-dominant culture is by no means universal. A key factor appears to be the approach of the department head,

who often plays a major role in "setting the agenda for what gets rewarded". So, while some interviewees spoke of a highly-supportive department head who "valued what I was doing with my teaching and understood the impact it has had on students", others noted that "the Head of Department is not in the least bit interested in teaching, as long as you are doing it and it doesn't cause any grief". In this regard, the letter of recommendation written by the departmental head to support a case for promotion was understood to be highly influential in determining a candidate's chances for both nomination and success.

3.2. Measuring and evidencing teaching achievement

"Finding a good yardstick to measure what good teaching is" was identified as a major barrier to recognising and rewarding teaching achievement in academic promotions. Many interviewees contrasted teaching with research, comparing the ease with which performance in the two domains could be demonstrated and evidenced. One interviewee summed up the dominant view: "research citations are not a bad proxy for peer standing and impact… but metrics which capture learning impact are much harder and more expensive to capture. There is no clear calibration about these things… The question of teaching delivery, teaching innovation and teaching management – we have not been able to disentwine these things. Teaching is out-of-sight difficult to measure".

As illustrated in Figure 11, while 80% of survey respondents identified the evidence used to evaluate research achievement as 'very robust' or 'somewhat robust' in promotion to professorship, only 29% reported the same levels of confidence for the equivalent teaching-based evidence. Universal, internationally-accepted metrics of research achievement were also seen to make such evidence "much more portable". With inter-institutional mobility a feature of successful academic careers, "national and international agreement on research assessment metrics" standardises the appointments criteria for new candidates and facilitates national and international career advancement: "you can take your CV to Mongolia or MIT – it would be completely

transferable. Research papers, citations, [research] income, it is a currency that everyone understands. The same is not true for teaching".
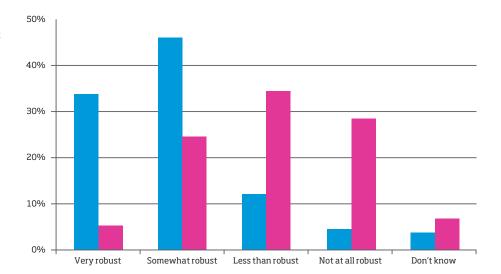
In line with survey responses, many interviewees regarded the measures employed in promotion procedures to evaluate teaching achievement as "woolly" and "lacking in any rigour – they would never pass a peer review if they were included in a journal article". They were particularly critical of online student course evaluations, which were reported to be the primary teaching measures used in standard T&R promotions decisions: "because people don't have anything better, student surveys are given a weight they don't deserve". With "very low response rates, you end up inferring an awful lot about teaching and learning performance on the feedback from a few random students". Indeed, evidence from the US (Henderson et al, 2014), drawing on interviews with physics faculty, suggested that academic staff place limited weight on student evaluations in their own assessments of teaching quality.

The increasing reliance on quantitative student feedback scores was suggested by some to have created "a one-size-fits-all model, [where] we are expected to all be the same… It is more difficult to do something risky and challenging in your classes… we worry about upsetting the students rather than doing what is good for them". For some interviewees, "electronic student feedback is only good for proving that you are not bad at teaching, but nothing more. It does not reliably tell you anything about whether you do it well". Although alternative measures such as teaching portfolios[4] were broadly viewed more positively, a number of senior interviewees raised concerns that "self-reflection is not tied to our core business. We need better metrics for teaching, but they need to be tied to our core business. Otherwise we are just creating another hurdle for people to jump over". Other interviewees proposed measures which, although "more laboured and difficult to collect", were seen to be "a much better measure of the quality and long-term impact of our teaching". One suggestion was a "survey of engineering students five years out [from graduation], to identify their employability and engineering knowledge and skills". Others called for a more robust system of teaching assessment, drawing on multiple sources of evidence, including reflective portfolios, peer assessment across and between universities and evidence of graduate career trajectory.

Many interviewees with promotion board experience suggested that, if a more robust and reliable system for assessing teaching achievement was available, **the weight accorded to teaching in the promotion process would significantly increase**

[4] Teaching portfolios are personal records of growth and achievement in teaching and learning, providing a self-reflective narrative about the academic's teaching philosophy as well as a statement of their activities, responsibilities and future goals.

Figure 11. Survey responses to the question "how robust are sources of evidence used in assessment of research/teaching quality for promotion to professorship?", showing responses for research quality (blue) and teaching quality (magenta)

- evidence to assess research quality
- evidence to assess teaching quality

Although senior survey respondents were significantly more likely ($p < 0.05$) to identify teaching-based measures to be 'very robust' or 'somewhat robust' than their junior counterparts, many still expressed serious concerns about their reliability and suitability for use in promotion decisions: "they are a very blunt instrument and not fit for purpose". Such concerns appear to reduce the weight that promotion boards consider it appropriate to give them. Indeed, many with promotion board experience suggested that, if a more robust and reliable system for assessing teaching achievement was available, the weight accorded to teaching in the promotion process would significantly increase.

In light of these widespread concerns about teaching-based measures, many prospective promotion candidates appear to be looking beyond the university to evidence their teaching contribution. Interviewees spoke in particular about the important role played by independent teaching awards in promotion cases. They noted that the criteria used for such awards were often "more nuanced and thoughtful" than those included in university promotion procedures. In addition, these awards were judged by "people who understand teaching and learning" and were therefore seen as well-placed to distinguish "the teaching stars, the innovators, the people who are pushing at the boundaries of our knowledge and influencing practice elsewhere" from "the good solid citizens who do a good job in the classroom". The National Teaching Fellowship Scheme (NTFS)[5] was singled out as a valuable

"external stamp of approval". Indeed, for a high proportion of teaching-focused interviewees, securing an external teaching award was regarded as a prerequisite for career advancement: "the only people who apply for promotion on the teaching track are the national teaching fellows because they have a metric to put on their application".

A number of engineering schools have taken a basic teaching award model and established new teaching recognition schemes that operate in parallel with promotion procedures. Evaluated by teaching and learning specialists, the schemes and their associated measures enable potential promotion candidates to identify and collect the evidence that they need. As one example, the engineering faculty at the University of Western Australia has established the Faculty Academy for the Scholarship of Education[6], with three tiers of membership. This academy offers academics structured support to develop a solid evidence base for promotion on the basis of teaching achievement. A second example is from the Faculty of Engineering at Lund University, as described in Box 1 in Section 3.6. Such systems offer a valuable and more robust assessment of teaching achievement that, in turn, can provide a framework around which to build and support the candidate's case for promotion. Some schemes have also played an important role in influencing and improving the promotion procedures themselves, both at their institution and beyond.

[5] National Teaching Fellowship Scheme (http://www.heacademy.ac.uk/ntfs)

[6] Faculty Academy for the Scholarship of Education, University of Western Australia (http://www.ecm.uwa.edu.au/staff/learning/FASE)

3.3. Demonstrating influence and leadership in teaching

Interview feedback suggested that the career trajectory of teaching-focused academics often hit a "glass ceiling" at the senior lecturer level, with promotion to full professorship representing a major, and often insurmountable, challenge. This issue was linked, in part, to the "inherent difficulty in demonstrating international influence and leadership in teaching". In particular, it was noted that, "being a better research academic calls for promotion, but being a better teacher does not". In other words, while improved research performance builds progressively towards professorial promotion, "for teaching, we reward leadership in education rather than performance in the classroom". As one engineering dean noted, "...those who take the teaching track need to understand that good teaching will not do the job. Fundamentally, they need to demonstrate leadership – step up to the national and international scale".

Interview evidence pointed to three primary barriers to demonstrating the levels of leadership in teaching commensurate with a professorial appointment, as outlined below.

The first barrier was reported to be the lack of clearly defined teaching-based criteria for professorial promotions by UK universities: "we have not decided what constitutes teaching excellence at more senior levels... there is still some work to do here". This lack of clarity was seen to impact on the career decisions of prospective promotion candidates as well as on the assessments made by promotions boards. Without "role models to follow" and "any good way of judging their effectiveness", most teaching-based professorial promotions appear to be each "treated as a special case... our promotions are not part of the normal annual promotions and normal department business". Indeed, many of the successful teaching-based promotion cases described by interviewees did not appear to comprise a blended range of indicators; most seemed to rely predominantly on one outstanding criterion. These decisive promotion criteria varied widely, including, for example: (i) "the remarkable success" of the graduates from a candidate's courses in securing prestigious external prizes,
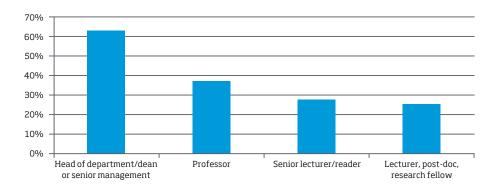
(ii) a pedagogical research portfolio with national and international significance, and (iii) "incredible teaching ability and commitment to the students over many decades". One interviewee from senior university management observed, "if we really believe that we are taking teaching seriously, we need to have more robust [teaching-based] criteria for final promotion to professor... not simply whether we can put them in front of students or not".

The second barrier concerned the difficulty of identifying and collecting education-based evidence to support a professorial promotion case that does not rely on a pedagogical research portfolio: "unlike with research, you cannot pull the evidence together in the week before your application... [for a teaching promotion case] you must keep a constant record of your achievements. If you miss the opportunity to capture the evidence, then the moment is passed. You must think about it continually". Examples include (i) gathering systematic evidence of the impact of an innovative educational approach or curriculum reform on student knowledge, skills and attitudes, (ii) developing and maintaining a reflective teaching and learning portfolio, or (iii) informing institutional/national/international policy or practice in engineering education.

It was suggested that prospective candidates often do not have a clear idea of what teaching-based evidence is required to build a strong case for promotion and therefore do not start "laying the groundwork" at a sufficiently early stage. As one interviewee noted, "too many people only think about what happens in the classroom... they do not recognise their achievements in teaching". A number of engineering schools have sought to tackle the issue of evidence-gathering directly. For example, the Engineering Faculty at University College London recently held a workshop to "talk about promotion by teaching and identify what a successful case might look like and what evidence would be used", as presented by representatives from the university promotions panels and successful candidates for teaching-based promotion.

The third barrier identified was the difficulty of establishing a world-class research base in pedagogical scholarship: "... the grade of professor implies an international dimension... but the opportunities for international influence

> "Unlike with research, you cannot pull the evidence together in the week before your application... [for a teaching promotion case] you must keep a constant record of your achievements. If you miss the opportunity to capture the evidence, then the moment is passed. You must think about it continually"

Figure 12. Survey respondents by grade selecting 'teaching has more value than previously' in response to the question "in the past five years, how do you think the value placed on teaching has changed in your university?"

and scholarship are much more limited on the teaching side". One specific constraint, particularly apparent in the UK context, is "the access to research funding and the lack of prestigious research partners". Interviewees often spoke about having to "be very creative in finding research funding… there is nowhere obvious in the UK to look for funding". All potential UK-based funding sources were seen to provide only modest levels of support: typically the Individual Teaching Development Grants of £7k, offered until recently by the Higher Education Academy, or small funding allocations secured by "lobbying the head of school". Within the United States, the scholarly discipline of engineering education has grown significantly over the past decade, and departments of engineering education, such as Purdue University and Virginia Tech, are building a strong international profile. Academic promotion cases within these departments are comparable to those seen in traditional engineering departments, drawing on criteria such as research income and peer-reviewed publications. A number of interviewees suggested that the success of this model has been contingent, in part, on the "significant levels of research funding for engineering education available through agencies like the National Science Foundation", where grants are typically US$100–$300k per year. Without access to equivalent funding in the UK, many interviewees suggested that establishing international impact and influence was a considerable challenge. This was seen as a particular issue for universities where the teaching criteria for promotion included educational research: "some university promotion criteria only want to see pedagogical research that is suitable for the REF… this is a real barrier to dedicating yourself wholeheartedly into the education side. It leaves you quite isolated".

3.4. Practices that reinforce academics' negative perceptions

As demonstrated throughout this report, perceptions of the university promotion system vary considerably by seniority, with assessments made by senior university managers consistently more positive than those of academic staff. The group least likely to report that teaching was valued in academic promotions was lecturer/senior lecturer: individuals who would typically either be developing their own promotion case or advising peers who are doing so, as discussed in Section 2.2.

Although a number of factors contribute to these differences, the survey and interviews highlighted one issue in particular. This relates to the question of whether the university promotions process had changed in ways that give greater recognition to teaching.

The majority of senior university managers interviewed, from a range of different university types and mission groups, spoke about a fundamental change they had witnessed at their institutions over the past decade. This had "increased the prominence of teaching and the student experience, including within the promotion systems… So all new [members of the university promotion committee] now go through a briefing session, which makes it very clear that teaching is a priority". As one dean noted, "in my time, we have become less likely to promote people on research prowess alone. We are taking teaching more seriously. It has moved beyond a tick-box mentality… The policies are much more explicit. It was always strongly implicit. If you had poor teaching scores but an excellent research contribution, you would still get promotion… [but now]

"The only people who really know what goes on are the people actually on the [promotions] panel". Without evidence that promotions board are "taking teaching seriously", many assume that they are not. The reality, however, may be quite different

[7] University of Wollongong, records from the academic promotions committee (http://www.uow.edu.au/dvce/ltc/teachdev/evidenceforpromotion/index.html)

the promotional paths are more clearly articulated, including those that allow you to focus on teaching".

Academic staff were less likely to report such institutional changes in priority, as illustrated in Figure 12. Despite an "increasing rhetoric… from the vice chancellor about how teaching well is now a priority at the university", many "rank and file academics are not convinced that this holds up in reality". Indeed, among the lecturers and senior lecturers responding to the survey, two of the most significant barriers to better rewarding teaching were identified as "university senior management" (as identified by 53% of respondents in these groups) and "perceptions of the views of promotion boards" (as identified by 65% of respondents in these groups).

In addition to the influence of the perceived "dominant research culture" (see Section 3.1), interview evidence highlighted a number of factors that appear to reinforce this widespread scepticism among academic staff about their university's commitment to rewarding teaching. Each is outlined below.

1. **A lack of transparency in the promotions system**: Both the decision-making processes and outcomes of university promotion processes were widely regarded to be opaque, where "the only people who really know what goes on are the people actually on the [promotions] panel. This information has not filtered down to the troops… people don't know who has applied for promotion and who has been turned down". Without evidence that promotions boards are "taking teaching seriously", many simply assume that they are not. The reality, however, may be quite different. For example, a significant number of senior interviewees indicated that, despite low application numbers, "the success rate for teaching-only promotions is over 50%, in many instances". The sharing of information on success rates would undoubtedly help prospective candidates to make a more informed choice about whether and how to seek promotion. Inspired by the University of Wollongong in Australia[7], Newcastle University is in the process of gathering university-wide data on annual success rates for teaching-focused promotion. Some senior interviewees suggested that this approach could be taken further and applied to 'standard' T&R promotions,
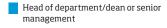
through "publishing data on how many [candidates] got promoted and how many did not, indicating on a simple grading system which of the three areas – research, teaching and administration – were outstanding" in each case. Such an anonymised system would give greater transparency to institutional promotion processes and, for some, would help to "dispel the myth that the outstanding researchers will always get promoted, even if they are terrible teachers".

2. **University "fashions and crazes"**: A number of interviewees spoke about "the coming and going of university fashions and crazes", where particular topics of interest were heavily endorsed by university senior managers during their term of office, but not maintained by their successors, allowing institutional priorities to "swing back" to the status quo. In this context, many expressed uncertainty about whether the current level of endorsement of teaching by senior management at their own university was simply a short-term trend that would be reversed "as soon as the winds change or the next vice chancellor comes along". In consequence, many reported feeling reluctant to "believe the hype" until teaching became an institutional priority for a sustained period of time.

3. **Priorities evident in annual appraisal systems**: The "balance of time attributed to teaching and research activities" during the annual academic appraisal system was seen as indicative of the relative importance of teaching and research for individual careers, departments and the institution as a whole, and played an important role in shaping expectations about promotion prospects among prospective candidates. Most academic staff described appraisals that were predominantly focused on research, with any attention given to teaching achievements typically being "not a very long conversation at all… just ticking off your student feedback scores and number of courses". As a result, many prospective candidates assumed that teaching would, similarly, be attributed little weight in the promotion process.

4. **Observations of "who is being promoted"**: The typical successful candidate for academic promotion was described by some senior interviewees to be the "all-rounder, the people who excel at research, teaching and administration… It is rare to have an
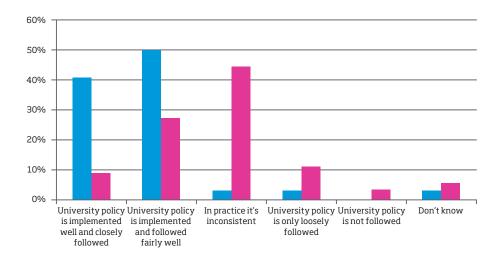
Figure 13. Responses to the question "how well do you think your university policy on teaching is implemented within your department?", for senior university managers (blue) and academic staff (magenta). Only individuals reporting that teaching achievement was a feature of their university's promotion policies were invited to respond to this question

■ Head of department/dean or senior management

■ Post-doc, researcher, lecturer, senior lecturer, reader

excellent teacher who is not also an excellent researcher". It was suggested by some that, while such candidates bring "a balanced CV, with excellence in all areas", their research achievements are often more visible and are therefore the element to which many attribute the promotion success: "from the outside, it is difficult to dissect whether their teaching played a role [in their promotion], because they would have been promoted from their research record anyway".

3.5. A policy/practice gap

Promotion procedures vary across universities, but most appear to involve an initial discipline-based shortlisting, approval or recommendation process, followed by cross-institutional assessment by a promotions board comprising senior university management, deans and often some/all department heads.
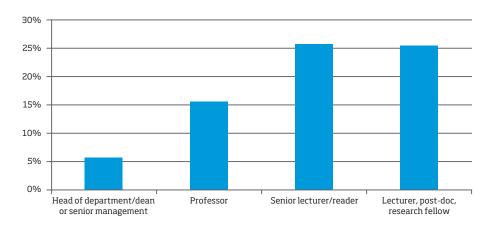
Survey and interview evidence suggested widespread scepticism about the priorities underpinning the decisions made by promotions panels. As illustrated in Figure 5 (Section 2.2), it is widely perceived, particularly by more junior academic staff, that university promotion policies do not encourage the recognition of teaching. For many, however, the barrier does not lie in the policies themselves and their failure to recognise and give weight to excellence in teaching, but rather in "the gap between the rhetoric and the implementation when it comes to teaching". In other words, the teaching-focused criteria evident "on paper" are not carried forward in practice.

A recent analysis of university promotion policies and practices in UK universities (Cashmore et al, 2013) finds some evidence for this view: the report concluded that, although "progress had been made" in recent years towards developing coherent promotion policies for teaching and learning contribution, "these policies are not yet well embedded and there is a significant lag between policy and full implementation".

Figure 13 presents survey responses to the question "how well do you think your university's promotion policy on teaching is implemented in your department?" for respondents who reported that teaching excellence featured, to some extent, in their university promotion policies. A marked difference in views by seniority is apparent, with 41% of senior university managers reporting that their 'university policy is implemented well and closely followed' compared to 9% of academic staff. Almost three in five (59%) of the latter group reported that the implementation of their university's policy on teaching was 'inconsistent', 'loosely followed' or 'not followed'. Female respondents were significantly more likely than their male colleagues to be sceptical about the implementation of teaching-based promotion policies. Women were almost six times less likely to report that 'university policy is implemented and followed fairly well' (39% of male respondents reported this view compared to 7% of female respondents, p < 0.005).

Interview evidence also pointed to variations in practice between institutions. As one interviewee commented, "the promotions priorities are highly variable. It is based on who is chairing the promotions

Figure 14. Survey respondents by grade reporting 'none' in response to the question "thinking about your own career progression, how much incentive is there from your department to devote time to developing your teaching practice?"

committee and how they interpret the criteria that are written. There is a lot of latitude in terms of interpretation". It was also suggested that disciplinary differences in attitude can be significant and play an important role in determining promotion outcomes. As one interviewee noted, "in some faculties, the chances of being promoted [for teaching achievement] are negligible, but I have seen people in other faculties fly through". Some interviewees reported that smaller universities had greater scope to establish a unified, cross-institutional approach to rewarding teaching achievement: "it is up to the chair [of the promotions committee] to drag us back to what is intended. Not all heads of department see it the same way, but it is much easier to pull people together in a small university".

Overall, opinions were split on whether promotions committees consistently adhered to university guidance when assessing teaching performance. To some, promotions committees largely comprised "a motley group, made up of research-focused academics" whose priorities focused on "preserving the reputation of the institution and protecting their discipline", a goal that was achieved by rewarding high-impact research output. In addition, it was suggested that many engineers "find it hard to deal with [the] qualitative data" often associated with teaching-based promotion criteria and therefore give it little weight when making promotions decisions. However, other interviewees, predominantly those in senior positions, painted a much more positive picture. While recognising that policies and practice were seen to be misaligned, they argued that the gap was now no longer evident.

3.6. Departmental incentives for the reward of teaching

Interview and survey evidence point to inconsistencies in the incentives for rewarding and recognising teaching at various levels of the university organisation. Specifically, the drivers for incentivising teaching achievement were often less apparent at the department and individual academic levels than they were for the institution as a whole. As a result, the filtering system that often exists at a departmental level to select or endorse high potential candidates, in some cases, may be screening out those whose case is more strongly reliant on teaching. As one senior manager commented, "at the very highest position [in the university] there is now a genuine commitment to teaching. I fear that before you get to the highest levels of review, you have to go through the peer stage, the department. I am not sure these people have had the same change in attitude". So, for example, when asked 'thinking about your own career progression, how much incentive is there from your department to devote time to developing your teaching practice?', one in five (20%) of senior university managers reported 'a lot' compared to less than 3% of academic staff. Conversely, as illustrated in Figure 14, while a quarter (26%) of academic staff reported there to be no incentive at all, only 6% of senior managers agreed.

The perceived incentives for rewarding teaching at the three different organisational levels – university management, departmental management and the individual academic – are outlined

At the department level, despite "intense scrutiny of our NSS scores", high-level strategic priorities were reported by many to focus on research output and student numbers, with teaching quality relegated to a more marginal role

below, as reported by the survey and interview respondents.

Senior university managers, or those with previous senior management experience, consistently spoke about improving teaching quality being a major and prominent institutional priority. Many reported being "mindful of what our students say about us… we have the university reputation at stake" with these priorities "translating directly into the promotion committee". During interview, many noted the increasing dependence of UK universities on student tuition fees, where "if the students don't like what they are getting, they vote with their feet… students are much more savvy than they were even 10 or 20 years ago. They do their homework before they come here…" through studying institution performance data such as NSS[8] scores and national/international rankings. As one dean commented, "if you want to know what institutions value, look at their sources of income and what drives their profit margins. In most cases, even at the research-intensive [universities], that will be teaching". Similarly, another spoke about the important role played by teaching-focused academics and fellows: "I am acutely aware that these people are responsible for a large slice of our income to the university".

At the **departmental level**, despite "intense scrutiny of our NSS scores", high-level strategic priorities were reported by many to focus on research output and student numbers, with teaching quality relegated to a more marginal role. As one interviewee put it: "the research allocation works on an as-earned basis. Whatever contributions you make to the REF or to research grants, [the department gets] most of the money … For teaching, you get a proportion of the income per students. It's just bums on seats". Many noted that, while investment of time and expertise in improving research output was seen to have a direct effect on departmental research income, the same was not true for teaching income: "student recruitment varies enormously, particularly for overseas students. There are large swings year by year and we have no knowledge of what the controlling factor is … As long as we do a reasonable job, I am not convinced that our curriculum or pedagogy play as big a role as we would like to think". One interviewee commented that, without evidence of a "direct correlation between

high quality teaching and high teaching and learning scores in the NSS, then incentivising good teaching will never be a priority… there is no direct incentive for a department head to recommend a teaching case for promotion". One department head described his priorities for financial management and planning: "you only have one point in the year when you can sort out student numbers, but this is very unpredictable and we only have one opportunity to get this right. There is very little [that academic] staff can do to affect this… The other income stream is research. This is the only thing I can lean on staff for – to bring in research income. From where I sit, research is more important because it affects the thing that I am responsible for – the budget".

At the **individual academic level**, two further incentives appear to reinforce the perceived link between research achievement and career advancement. Firstly, the individual contribution that a member of academic staff may make to income and departmental prestige is significantly more difficult to isolate and evidence for teaching activities than for research. As one interviewee commented, "the inputs and outputs for research are transparent and are attributable to an individual… Teaching is our bread and butter, but the inputs and outputs are more diffuse and the contribution of each staff member is less recognisable". Demonstrating individual impact on a promotions case or on a CV is therefore more transparent when it comes to research. Secondly, and as discussed previously, research achievements are portable: they are internationally recognised and valued in every engineering department across the world. As one department head noted: "If you want to invest in your career and change institution, you would be a mug to choose teaching. When you make these moves, the only factors that people care about are management experience and research output. Teaching is of no interest".

A number of institutions have sought to address this challenge by developing systems through which both departments and individual academics are offered direct incentives to improve and develop teaching quality. Probably the best example is from Lund University, Sweden (see Box 1), where the engineering school has developed a system, operating in parallel with the promotion processes, to identify

[8] National Student Survey (NSS) is a survey of all final year undergraduates in UK publicly funded universities, designed to gather student feedback on the quality of the courses studied.

and reward outstanding teachers. With the receipt of an award, the individual academic receives a permanent salary increase and the department receives a permanent increase in its allocation of teaching funding: both the academic staff member and the department are rewarded directly (and financially) for achievements in teaching quality. With this initiative now operating for well over a decade, as one of the individuals who established the Academy noted, "rewarded teachers are now in [senior] positions in the university… this has changed the culture… it is now part of the system".

Box 1: Case study of the Pedagogical Academy, Lund University, Sweden

Pedagogical Academy

Faculty of Engineering, Lund University, Sweden

Lund University is one of Scandinavia's largest universities, consistently placed within the world's top 100 universities in international rankings. The Faculty of Engineering is the largest single Faculty in the university, home to 9,600 students and 1,500 staff.

In 2001, the Faculty of Engineering established the Pedagogical Academy as a means to "raise the overall quality of teaching and student learning at the institutional level by rewarding excellent teachers and their departments" (Olsson and Roxå, 2013) and thereby promote a culture change across the engineering school.

Membership of the Academy brings considerable benefit to the individual academic, including the title of Excellent Teaching Practitioner and a permanent salary increase of €250 per month.

Membership also brings benefits to the department in the form of a permanent increase in the proportion of teaching funding allocated to the department; in line with this also comes a proportional decrease in teaching funding allocated to all other engineering departments within the Faculty.

To gain entry to the Academy, candidates must demonstrate a scholarly approach to teaching with a focus on student learning that clearly demonstrates improvements over time. The assessment criteria (Lund University, 2005) are included below:

1. **Focus on the students' learning process**
   a. The applicant's teaching practices based on the learning perspective
   b. The applicant's teaching and learning philosophy and teaching activities as an integrated whole
   c. The applicant's practical teaching in relation to the students

2. **Clear development over time**
   a. The applicant's efforts in his or her teaching, to consciously and systematically develop students' learning, and their ability to learn how to learn
   b. The applicant's ideas and plans for continued development as a teacher

3. **A scholarly approach**
   a. The applicant's reflections on his or her teaching activities using higher educational theory and knowledge of didactics relevant to his or her discipline
   b. The applicant's search for and creation of knowledge concerning the students' learning process in his or her own teaching
   c. The applicant's collaboration with others, the sharing of knowledge and experience in teaching and student learning through discussions, participating in conferences, etc.

Applications are considered by a dedicated judging committee, comprising elected Academy members, including a pedagogical expert, each of whom have each received specialist training. Candidates are asked to submit the following evidence of their teaching achievement, which is explored further during a formal interview:

- **Teaching portfolios**: the primary source of evidence for entry to the Academy is a 10–12 page teaching and learning portfolio, described as "a personal document where the teacher presents his or her teaching philosophy (reflections about teaching and students learning), together with integrated examples from their teaching practice" (Olsson and Roxå, 2008).

- **Letter of recommendation**: a letter from the candidate's head of department, verifying that they are "an excellent teacher [who] has no shortcomings in his or her relation to students or colleagues" (Olsson and Roxå, 2013) .

- **CV**: the candidate's CV, detailing their teaching duties and pedagogical achievements.

- **Testimonials**: testimonials from at least two 'critical friends' with whom the candidate has discussed their teaching philosophy and teaching portfolio.

By 2014, 110 academic staff had been elected to membership of the Academy, of which around one third were full professors. Once elected, Academy members are expected to continually develop their teaching portfolio and support other staff in developing their case for membership.

Image courtesy of University of Cambridge, Department of Engineering, Institute for Manufacturing

4. How can we better reward teaching excellence?

4.1. Key issues

This study has gathered views from across the UK engineering academic community on the extent to which teaching excellence is seen to be recognised and rewarded in the promotions process. It points to two major issues, each with the potential to impede the progress of UK engineering education.

Firstly, the study indicates that many in the UK engineering education community do not believe that excellence in teaching offers opportunities for promotion equivalent to those available for research. For many academic staff, the evaluation of teaching in academic appraisal and rewards procedures was seen to be little more than a "tick-box" exercise that added little to career advancement. Senior university managers, however, were of the view that selection and promotion procedures had changed fundamentally in recent years and teaching is now a much more prominent element of the assessment process. Nonetheless, negative perceptions of the system continue to be held by the majority of academic staff. These perceptions are likely to reduce the pool of potential candidates willing to submit an application for teaching-focused promotion and limit the time that 'standard' T&R academics are willing to invest in teaching activities.

Secondly, the study identified structural issues that militate against greater weight being given to teaching in the promotions process. Two emerged in particular:

1. An increasingly research-dominant culture in higher education was seen to have had a negative effect on the recognition and reward of teaching excellence. Many regarded research excellence to be the key determinant of institutional reputation, as evidenced by the international rankings and the REF, and also to be the major component of their professional academic responsibilities over which academic staff were able to demonstrate individual influence. These pressures appear to constrain how teaching is recognised and championed at all levels of the organisation: for academic staff when identifying priorities for career advancement and mobility, for department heads when nominating and recommending candidates for career advancement, and for promotions committees during their decision-making process. Compounding these issues is the manner in which universities allocate departmental resources, models which are based on research quality (QR[9], research grant income) and student numbers (fee income), rather than teaching quality. The incentive structures at departmental level therefore do not encourage academic managers, and most importantly department heads, to support and nominate cases for promotion based on teaching excellence rather than research.

2. At many institutions, teaching-based promotion criteria, and the evidence required to demonstrate achievement of these criteria, remain poorly articulated, making it difficult for potential candidates to prepare promotion cases and for promotion committees to assess them. Unsure of the criteria, potential promotion candidates with a strong teaching record often do not collect appropriate evidence of their teaching achievement on an ongoing basis. As a

Unsure of the criteria, potential promotion candidates with a strong teaching record often do not collect appropriate evidence of their teaching achievement on an ongoing basis

Department heads appear to be crucial in establishing a departmental culture that celebrates and values teaching achievement

result, at the point where a promotion case might be submitted, their evidence base may be weak; the candidate therefore either focuses their case on research, submits an application that is a poor reflection of their teaching contribution, or does not submit at all. From the perspective of the promotions board, reservations about the validity and reliability of the measures of teaching achievement – particularly the extent to which they genuinely reflect the quality and contribution to student learning – also appear to reduce the weight attached to teaching in the promotion process.

The study evidence highlighted the pivotal role played by department heads, operating at the interface between the profoundly differing views of academic staff and senior university management. Department heads appear to be crucial in establishing a departmental culture that celebrates and values teaching achievement: among the 'success stories' described by interviewees, where teaching achievement played a positive and substantial role in career advancement, active support from a department head invariably played a key role. However, as a number of interviewees pointed out, university resource allocations mean that "it is not always in [their] best interests" to reward teaching achievement, particularly if it comes at the expense of retaining and attracting "star researchers who are going to bring in the big research grants". It was therefore suggested that nominating and supporting cases for promotion which emphasised teaching was often driven by a department head's intrinsic motivation and personal commitment rather than their priorities as a departmental manager. This apparent lack of incentives for department heads to support teaching-centred promotion is compounded by the poor perceptions of promotions priorities by academic staff and the problems with evidencing teaching achievement.

4.2. Recommendations

This study has captured perceptions of how teaching is rewarded in academic promotions and highlighted barriers to improving the recognition and reward of teaching achievement. Although the findings are drawn from engineering schools and departments, they are likely to have wider applicability across the national and international higher education system as a whole.

It also must be acknowledged that the principles and procedures governing academic promotion are not discipline-specific; universities operate institution-wide systems. Significant and sustainable change therefore requires the engagement of the wider higher education sector. The engineering community has an important role to play in championing such change.

The study points to the four mechanisms through which to ensure teaching achievement is, and is seen to be, appropriately rewarded in the promotion process. They are presented as recommendations to those in leadership positions in the UK higher education sector, in university senior management, higher education funding agencies and the UK Higher Education Academy.

- **Recommendation 1: improve the transparency of promotion decisions**. Placing anonymised data in the public domain that demonstrates the priority placed on teaching achievement in the promotion system could help to shift perceptions and improve practice. For example, universities could provide information on successful promotions based on the respective domains of research, teaching and administration at a level of aggregation to ensure anonymity. The release of annual data demonstrating that teaching excellence was routinely rewarded and poor teaching was not routinely overlooked may challenge perceptions that the promotions process was weighted towards research. In institutions where a significant policy/practice gap exists, and teaching achievement is not routinely rewarded, such transparency may also encourage greater adherence to the written guidance by promotion boards and improve outcomes overall.

- **Recommendation 2: develop a robust set of measures to demonstrate teaching achievement**. The higher education community urgently needs to develop teaching-based promotion measures, with transferability across and between institutions, which better reflect academic achievement and contribution to teaching such as the Higher Education Academy National Teaching Fellowship Scheme. The development of such a system would require a community-wide effort. However, a set of measures in which both academic staff and senior managers had confidence has the potential to transform how teaching is recognised and rewarded.

- **Recommendation 3: improve the information and support offered to candidates for teaching-based promotion**. Coherent and ongoing support should be offered to candidates wishing to emphasise teaching achievement within their case for promotion, to help them (i) identify the types of indicators that contribute to a strong case for promotions, and (ii) establish a system by which they are able to collect evidence of their teaching achievements on an ongoing basis.

- **Recommendation 4: realign departmental resource allocations to reflect the quality of teaching**. Universities might consider developing departmental resource allocation systems that recognise and reward high

teaching quality, rather than just student intake numbers. Similar to a model developed at Lund University described within the report, such a system may help to incentivise department heads to support, encourage and endorse promotion cases with a strong teaching component.

The study evidence suggests that these four recommendations would enable teaching to be more appropriately and consistently recognised in higher education in a way that is seen and understood by academic staff. Together, they would help to create to a culture where academic staff believe that their teaching contribution will be rewarded, and provide them with transparent, robust processes through which to demonstrate these achievements. Evidence from the study suggests that many in the higher education community are eager to see such reforms carried through in practice, and signs of change are already evident in UK universities. The engineering community is well-positioned to take a lead in this transformation. Indeed, the Royal Academy of Engineering has already commissioned research to develop a new set of metrics to evaluate and evidence teaching achievement within academic promotions.

With teaching excellence integrated into the promotions process, engineering education in the UK would be equipped to provide world-leading programmes that prepare graduates for the engineering challenges of the 21st century.
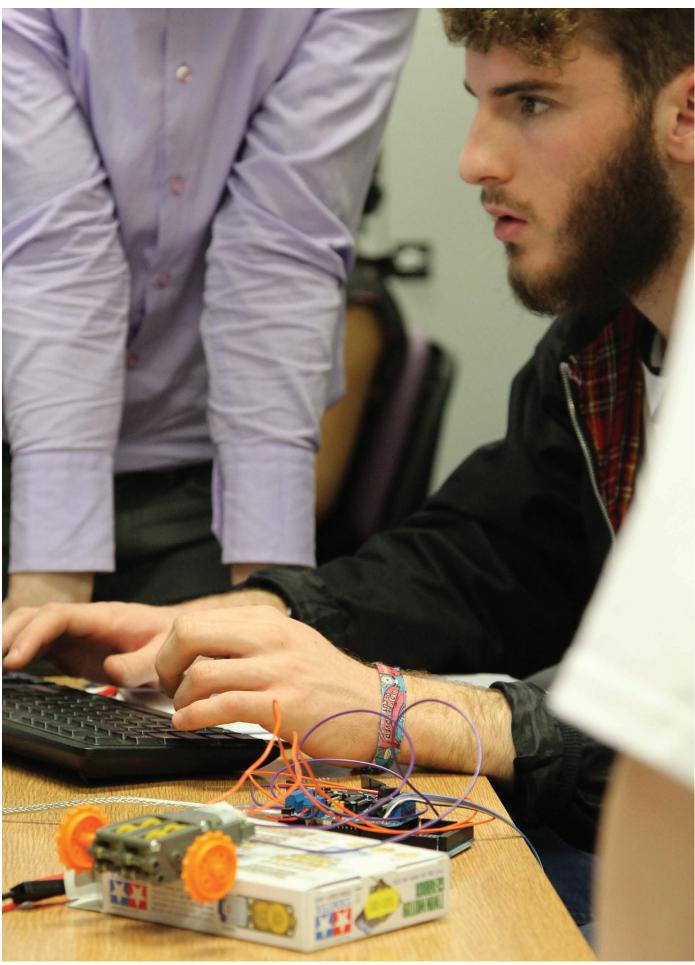
Image courtesy of UCL Engineering

Appendices

Appendix A
Online survey design and methodology

A.1 Questionnaire design methodology

The questionnaire structure and design was developed on the basis of three sources of evidence, collected between October and December 2013: (i) a literature review of the field, (ii) pre-survey interviews with a range of stakeholders to identify key issues arising, and (iii) cognitive interviews to test draft versions of the online survey on sample respondents. Each stage is outlined below.

The **literature search and review**, although not exhaustive, considered published work from within three areas of interest:

- the role of teaching in reward and promotion procedures within higher education (such as Norton et al., 2013, Academy of Medical Sciences, 2014, Ramsden and Martin, 1996, Cashmore et al., 2013, Higher Education Academy, 2013);

- the role of teaching in reward and promotion procedures within the discipline of engineering (such as King et al., 2009, Olsson & Roxå, 2013, Soyster, 2008, Saemundsdottir et al., 2013, Besterfield-Sacre et al., 2014);

- indicators of university teaching and learning quality (such as Chalmers, 2011, Gunn & Fisk, 2013, Berk, 2005, Felder and Brent, 2004).

Pre-survey interviews were held with seven UK-based engineering academics, researchers, teaching fellows and senior university managers. The interviews were designed to highlight key issues, concerns and perspectives held by members of the UK engineering academic community relating to the reward of teaching. The survey questionnaire was subsequently designed to allow perspectives on these themes to be captured from a wider cross-section of the community. Topics highlighted during pre-survey interviews included a perceived policy/practice gap with respect to teaching during promotions decisions, a lack of status and career progression opportunities available to teaching-focused staff, a marked difference between perceived practice and preferred practice in the reward of teaching and a perception that teaching achievement was afforded a significantly lower status than research within universities.

Using **cognitive interviews**, draft versions of the questionnaire were pre-tested with nine sample respondents to validate its comprehension, coverage, length and structure. Respondents were selected from a range of backgrounds (seniority, university mission-group, research/teaching focus of role, etc.). Through an iterative process, the findings from each of the early pre-tests were used to amend and update the survey questions. At the point when five consecutive pre-test interviews identified no further amendment to the questionnaire, the cognitive interview process was concluded.

On completion of the cognitive testing process, the survey questionnaire was approved by the Royal Academy of Engineering and programmed into the web-based survey instrument Survey Monkey Pro.

A.2 Questionnaire focus

The survey was designed to capture **respondents' perspectives** across four broad areas:

1. **Current practice**: including (i) the extent to which teaching excellence is rewarded in academic appointment and promotion procedures within UK engineering schools, and (ii) the type and perceived quality of the performance measures employed to assess these teaching achievements and contributions;

2. **Departmental cultures and priorities**: including (i) the value placed on teaching excellence and innovation within engineering departments, (ii) the role played by teaching-only academics/staff, (iii) the relative value assigned to teaching and research activities by engineering departments, and (iv) how the priority placed on teaching excellence is changing;

3. **University policies and processes**: including (i) the prominence of teaching within university appointment and promotion policies, and (ii) the extent to which such policies are implemented in practice;

4. **Personal priorities and opportunities for change**: including (i) the value that respondents would like to see placed on teaching in appointments and promotions procedures, (ii) how this might differ from the practice they perceive within their own department/university, and (iii) the barriers apparent to changing how teaching is currently valued and rewarded.

The survey questions are provided in Appendix B.

A.3 Data collection

Survey responses were collected between December 2013 and February 2014. Email invitations to participate were distributed by the Royal Academy of Engineering, the Engineering Professors Council and the Higher Education Academy.

Given the potential for sampling bias towards academics with a pre-existing interest in teaching, considerable effort was focused on canvassing a representative balance of views, in both the survey and interview processes. So, for example, dedicated email invitations were sent to selected recipients of Royal Academy of Engineering research grants to maximise returns from individuals with a strong research profile.

In all, invitations were sent to the following groups:

- membership of the Engineering Professors Council (EPC);

- selected recipients of Royal Academy of Engineering research awards;

- all Royal Academy of Engineering Visiting Professors;

- membership of the Royal Academy of Engineering's Standing Committee for Education and Training (SCET);

- all email recipients of the Higher Education Academy HE STEM mailing list;

- all email recipients of the Higher Education Academy Engineering mailing list.

The email invitations introduced the purpose of the study, and contained the web survey link and contact details of the principal investigator. Invitations to the EPC and SCET groups, whose membership includes many of the UK's engineering department heads and deans, also included a request to circulate the survey link within their departments/schools.

All original email invitations were sent in the week commencing 13 December 2013. To improve response rates, a number of reminder emails were also sent in early January 2014.

A.4 Achieved sample and reporting conventions

Overall, data were collected from 690 respondents. Of these, 38 respondents were either not based in an engineering department or were not based in the UK and were therefore removed from the final sample. A further 48 questionnaires were duplicates, identified as originating from the same IP address as another respondent, and were removed from the analysis. The final number of respondents upon which analysis was based is 604. Valid responses to each question varied between 591 and 484 respondents.

The profile of survey respondents is shown in Table 1.

Because email invitations were sent through gatekeepers, information is not available about the total sample to which this survey was issued. It is therefore not possible to calculate a response rate for this study. However, the profile of respondents can be compared to other data about engineering academics to assess where biases may exist.

Table 1 indicates that, of respondents who reported their gender, 81% were male and 19% were female. This is a close reflection of the true gender distribution in engineering departments, where 83% of academic staff are male and 17% are female.[10]

Table 1. Respondent characteristics of the online survey

Respondent characteristics	Number	Percentage
Position		
Post-doctoral researcher/research fellow	31	5.1%
Teaching fellow	22	3.6%
Lecturer	130	21.5%
Principal teaching fellow	16	2.6%
Senior lecturer/reader	179	29.6%
Professor	112	18.5%
Head of department/dean	45	7.5%
University senior management	15	2.5%
Visiting professor	15	2.5%
Other	33	5.5%
Not reported	6	1.0%
Sex		
Male	394	65.2%
Female	93	15.4%
Not reported	117	19.4%
Primarily in a teaching role		
Yes	321	53.1%
No	270	44.7%
Not reported	13	2.2%
University mission group		
Russell Group	245	40.6%
1994 Group	71	11.8%
University Alliance	26	4.3%
Million+	16	2.6%
None of the above	60	9.9%
Don't know	68	11.3%
Not reported	118	19.5%

[10] Higher Education Statistics Agency, Staff in Higher Education Institutions, 2012/13

Table 1 also shows that 53% of respondents reported to be employed in a primarily teaching role. Data from the Higher Education Statistics Agency[10] indicate that 17% of UK engineering academics are teaching-focused, suggesting that this group is overrepresented in the survey. The survey was pitched as a study of the perceptions of teaching in engineering. Therefore, this bias is understandable as it would be more salient to those in primarily teaching roles.

Only results that are significant at the 95% level are presented in the report commentary.

Appendix B: Survey questionnaire

Welcome to Royal Academy of Engineering's Perceptions of Teaching in Engineering study. This study aims to understand how teaching is recognised and rewarded in academic engineering careers. The Royal Academy aims to use these findings to promote high quality teaching and learning in engineering. Your views on this topic are very important and we thank you in advance for taking time to complete this study. This survey is open to all engineering academics from post-doc onwards.

1. Which of the following is the closest fit to your current role?

☐ Post-doctoral researcher/Research Fellow

☐ Teaching Fellow

☐ Lecturer

☐ Principal Teaching Fellow

☐ Senior Lecturer/Reader

☐ Professor

☐ Head of Department/dean

☐ University Senior Management

☐ Visiting Professor

☐ Other

2. Do you have a role that is primarily focused on educational development or teaching?

☐ Yes

☐ No

3. When applying for a promotion at your university, which of the following statements best reflects the value given to teaching excellence?

☐ Teaching excellence is valued for all academic roles that include any teaching

☐ Teaching excellence is less valued if you have excellent performance in research and administration

☐ Teaching excellence is valued only for academic roles that specialise in teaching

☐ Teaching excellence is not valued at all

4. In your view, how important are each of the following factors currently in appointment to a first lectureship position?

	Very Important	Somewhat Important	Not very Important	Don't know
Research	☐	☐	☐	☐
Teaching/contribution to education	☐	☐	☐	☐
Industry and societal impact	☐	☐	☐	☐
Enterprise, consulting and research commercialisation	☐	☐	☐	☐

5. How important *would you like* each of these factors to be in appointment to a first lectureship?

	Very Important	Somewhat Important	Not very Important	Don't know
Research	☐	☐	☐	☐
Teaching/contribution to education	☐	☐	☐	☐
Industry and societal impact	☐	☐	☐	☐
Enterprise, consulting and research commercialisation	☐	☐	☐	☐

6. Thinking about appointment to a first lectureship, which of the following do you think *are most highly valued* by UK engineering departments and which do you think *should be most highly valued*? Select up to five factors that are most valued and five that should be most valued.

	Are most valued	Should be most valued
Ability to attract research funding	☐	☐
Awards, prizes and external recognition in research	☐	☐
Communication skills and interest in teaching	☐	☐
Engagement with innovative teaching approaches	☐	☐
Experience in engineering industry	☐	☐
High impact publications	☐	☐
Industry and societal impact	☐	☐
Outreach and community service	☐	☐
Scholarship in teaching and learning	☐	☐
Teaching and demonstration experience	☐	☐

7. In your opinion, how robust are the sources of evidence used to assess *research* quality in appointment to a first lectureship? (Possible sources of evidence might include the Research Excellence Framework criteria, number and impact of journal articles, etc.)

☐ Very robust

☐ Somewhat robust

☐ Less than robust

☐ Not at all robust

8 And, in your opinion, how robust are the sources of evidence used to assess *teaching* quality in appointment to a first lectureship? (Possible sources of evidence include peer review, student ratings, portfolios, etc.)

☐ Very robust

☐ Somewhat robust

☐ Less than robust

☐ Not at all robust

9. In your view, how important are the following factors currently in promotion to professor?

	Very Important	Somewhat Important	Not very Important	Don't know
Research	☐	☐	☐	☐
Teaching/contribution to education	☐	☐	☐	☐
Administration and departmental leadership	☐	☐	☐	☐
Industry and societal impact	☐	☐	☐	☐
Enterprise, consulting and research commercialisation	☐	☐	☐	☐

10. How important *would you like* these factors to be in promotion to professor?

	Very Important	Somewhat Important	Not very Important	Don't know
Research	☐	☐	☐	☐
Teaching/contribution to education	☐	☐	☐	☐
Administration and departmental leadership	☐	☐	☐	☐
Industry and societal impact	☐	☐	☐	☐
Enterprise, consulting and research commercialisation	☐	☐	☐	☐

11. For promotion to professorship, which of the following factors do you think *are most highly valued* by UK engineering departments and which factors do you think *should be most highly valued*? Select up to five that you think are the most valued and five you think should be most valued.

	Are most valued	Should be most valued
Ability to attract research funding	☐	☐
Awards, prizes and external recognition in research	☐	☐
Awards, prizes and external recognition in teaching	☐	☐
Demonstrated teaching quality	☐	☐
Engagement with innovative teaching or programmes of curriculum change	☐	☐
Enterprise and research commercialisation	☐	☐
Experience in engineering industry	☐	☐
High impact publications	☐	☐
National/international leadership in research	☐	☐
Scholarship and/or national/international leadership in teaching and learning	☐	☐
Student assessments	☐	☐
Don't know	☐	☐

12. In your opinion, how robust are the sources of evidence used to assess research quality in the promotion to professorship? (Possible sources of evidence include the Research Excellence Framework criteria, number and impact of journal articles, etc.)

☐ Very robust

☐ Somewhat robust

☐ Less than robust

☐ Not at all robust

☐ Don't know

13. And, in your opinion, how robust are the sources of evidence used to assess teaching quality in the promotion to professorship? (Possible sources of evidence include peer review, student ratings, portfolios, etc.)

☐ Very robust

☐ Somewhat robust

☐ Less than robust

☐ Not at all robust

☐ Don't know

14. How prominent do you think teaching excellence is in your university's *policies* on promotion?

☐ Very prominent

☐ Somewhat prominent

☐ It is there, but not prominent

☐ It doesn't really feature

☐ Don't know

15. How well do you think your university's promotion policy on teaching is *implemented* in your department?[11]

☐ University policy is implemented well and closely followed

☐ University policy is implemented and followed fairly well

☐ In practice it's inconsistent

☐ University policy is only loosely followed

☐ University policy is not followed

☐ Don't know

[11] This question was only offered to respondents who selected 'very prominent', 'somewhat prominent' or 'it is there, but not prominent' in response to Question 14

16. Thinking about your own career progression, how much incentive is there from your department to devote time to developing your teaching practice?

☐ None

☐ Very little

☐ Some

☐ A lot

17. In your department, how much value is placed on developing innovative teaching and learning approaches?

☐ None

☐ Very little

☐ Some

☐ A lot

18. In the last five years, how do you think the value placed on *research* has changed in your university?

☐ Research has less value than previously

☐ Research has more value than previously

☐ The value of research hasn't changed

☐ Don't know

19. In the last five years, how do you think the value placed on *teaching* has changed in your university?

☐ Teaching has less value than previously

☐ Teaching has more value than previously

☐ The value of teaching hasn't changed

☐ Don't know

20. In the next five years, do you think your university will change how it values and rewards teaching?

☐ Yes, teaching will be valued more highly than it is now

☐ Yes, teaching will be valued less highly than it is now

☐ No, the value of teaching will be unchanged

☐ Don't know

21. In your opinion, what are the main factors driving change in how teaching is valued? Please select up to five factors.[12]

- ☐ Better understanding and research on the importance of teaching
- ☐ Changes in university funding
- ☐ Influence of industry
- ☐ Influence of policy at a national level
- ☐ Influence of specific external organisations and groups (e.g. Institution of Civil Engineers)
- ☐ International university rankings
- ☐ Research Excellence Framework
- ☐ Student Data (Key Information Sets (KIS) and National Student Survey scores)
- ☐ Student expectations
- ☐ Student fees
- ☐ Student recruitment

22. To what extent do you agree or disagree with the following statements?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Teaching-only posts help improve the quality of learning in engineering departments	☐	☐	☐	☐	☐
Teaching-only posts are career limiting	☐	☐	☐	☐	☐
Teaching-only posts are used to remove poor researchers from the REF	☐	☐	☐	☐	☐
Research focused careers tend to be more successful	☐	☐	☐	☐	☐
Marketing statements about teaching excellence closely reflect practice in my department	☐	☐	☐	☐	☐
My department encourages attendance at teaching and learning events (conferences, CPD, etc.)	☐	☐	☐	☐	☐

[12] This question was only offered to respondents who selected 'Yes' (ie indicating that the value of teaching will change) in Question 20

23. Do you think teaching excellence should be better rewarded in promotions than it is at the moment?

☐ Yes

☐ No

☐ Don't know

24. Why do you think teaching excellence should *not* be better rewarded in promotions?[13]

☐ It is already well rewarded

☐ It is not as important as research

☐ It is not as prestigious as research

☐ It does not attract income in the way that research does

☐ It requires less ability than excellent research

☐ Other (please specify) _____

25. In your opinion, which of the following, if any, are barriers to better rewarding teaching excellence?

☐ Research Excellence Framework

☐ Lack of prestige compared to research

☐ Institutional policies

☐ Department leadership

☐ University senior management

☐ Perceptions of the views of promotion boards

☐ None of the above

☐ Other (please specify) _____

26. What type of engineering do you specialise in?

☐ Aeronautical

☐ Architectural

☐ Biological/Biomedical

☐ Chemical

☐ Civil

☐ Computing

☐ Earth sciences

☐ Educational engineering

☐ Electronic/Electrical

☐ Material

☐ Mechanical

☐ Other

[13] This question was only offered to respondents who selected "No' in response to Question 23

27. How much experience do you have of working in industry full time?

☐ None

☐ Less than 2 years

☐ 2–5 years

☐ More than 5 years

28. Are you male or female?

☐ Male

☐ Female

29. Is English your first language?

☐ Yes

☐ No

30. What is your university's mission group?

☐ Russell Group

☐ 1994 Group

☐ University Alliance

☐ Million+

☐ None of the above

☐ Don't know

31. Finally, are you currently based at a UK institution?

☐ Yes

☐ No

That is the end of the study.
Many thanks for your participation, it is very much appreciated.

Appendix C: Interview approach

A total of 52 individuals were interviewed as part of this study. Six types of individual were targeted for interview, as outlined below.

Interview target	Teaching-focused interviewees	Non-teaching focused interviewees
Senior university management, deans and department heads from engineering backgrounds (UK-based)		13
Engineering academics (professors, readers, senior lecturers, lecturers and teaching fellows) (UK-based)	8	12
Engineering postdoctoral researchers and research fellows (UK-based)		5
Other (representatives from engineering professional bodies, industry etc.) (UK-based)		1
Experts engaged in the development of new teaching-based reward systems (UK-based and international)	2	4
Engineering deans, department heads and academics (from outside the UK)	3	4

Interviews were one-to-one, typically of one hour in duration and most (92%) were conducted remotely by either Skype or telephone. Where requested, interview questions were supplied in advance. The interviews were semi-structured and conducted on an understanding of anonymity. The interview protocol varied between respondent group, but each was broadly structured around the key survey themes, outlined in Appendix A.2.

Efforts were made to select a cross-section of targets for interview, from a range of grades, backgrounds and institution types. The vast majority (94%) of candidates invited for interview agreed to participate. Their responses reflected the balance of views expressed in the survey, which suggests that any sampling bias in the survey is modest.

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Notes

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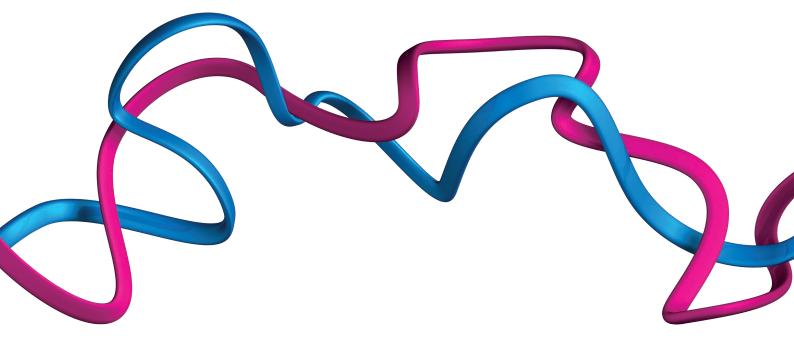
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