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# Developing a strategy for student retention

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**Abstract** Attracting and retaining high-calibre students in science and engineering is becoming more difficult. At the same time, we are urged by the UK Government to recruit from a wider pool. This has necessitated a review of how we go about recruiting and retaining our students. This paper sets out some of our underpinning ideas.

Student retention needs can be focussed on a number of stages. First, school-level motivation, starting at secondary, and probably even primary school level. Second, recruitment of students of the appropriate calibre, motivation and experience. Third, student induction, including an overview of subject and programme. Fourth, ongoing student support.

**Keywords** assessment; strategy; student induction; student motivation; student retention

With wastage rates in science and engineering often in excess of 20%, for many of us the issue of student retention is of future viability. For others the main issue is of the human cost of so many students missing out on an opportunity. Moreover, the decline in output of graduate scientists and engineers is being felt in industry, in teaching and other areas of employment. And we feel ourselves between the pincers of government pressure to process more students and a decline in the numbers of pupils for whom science subjects are an attractive option. So we feel the need to redouble our efforts to retain those students that we have managed to attract. As an institution whose mainstream is largely science and engineering, this has a considerable impact on UMIST.

## The need for a strategy

Thus far, our institutional efforts have been disjointed and we have tackled issues on an individual basis, but increasingly we are finding the need to tackle matters in a strategic way. The inspiration of our existing teaching and learning strategy and also a widening participation strategy has focussed our thoughts on the need to look for a recruitment and retention strategy. However, the strategies themselves run the danger of becoming piecemeal and we are mindful of the need to ensure 'joined-up thinking'.

## Retention and motivation

Before moving on to look at the policy aspects, it is worth pausing and reflecting briefly on the issue of student motivation and how this influences retention.

## Theories of motivation

Much of the theoretical work on motivation has been undertaken in the occupational arena rather than that of education. But there are some points that we can draw from these more general theories. Interestingly, much of the work undertaken by Herzberg<sup>1</sup> was undertaken with professional engineers. Herzberg and his colleagues differentiated between *hygiene* factors and *motivators*. Hygiene factors, such as personal security, finance, and working conditions, would not of themselves produce motivation but if they did not reach a basic minimum would act as inhibitors. The factors that truly motivated, in Herzberg's view, were things like autonomy, challenge, self-fulfilment, and scope for creativity. Maslow<sup>2</sup> suggested that there is a hierarchy of needs and that the lower order needs must be satisfied before the higher order needs produce motivation. These moved from basic needs like food, water and shelter to simple needs for safety, survival and security, to needs for social contact and acceptance, on to needs for recognition and building of self-esteem, thence to a need for autonomy and freedom of action and, finally, self-actualisation needs where individuals feel that they are achieving to the maximum of their potential. Some common points can be seen in these two approaches. Wankat and Oreovicz<sup>3</sup> use the Maslow model to try to help teachers to improve student motivation with factors under their control. Even where these are not directly controllable it can be important for the teacher to understand that poorer students may be struggling with simply the most basic of needs. Lewin<sup>4</sup> tries to set motivation in a complex mathematical plane where an outcome is the result of several different motivating forces, some internal, some external, each pulling in a different direction. Another dichotomy is drawn in the literature between *intrinsic* and *extrinsic* motivation, that is to say between motivation that comes from the individual's personal make-up and motivation that is influenced by some external reward, usually economic or social.

In terms of student retention, we need to be mindful of Maslow's lower-order needs and Herzberg's hygiene factors. The Government view has often come across as a belief that retention is solely an academic issue, though we are now beginning to detect some back-peddalling on the issue of financial support. The key point is that we cannot expect students to be intrinsically motivated on empty stomachs. We do need to pay attention to the factors that are likely to distract students from their studies.

## Motivation and education

Some of the writing on student motivation (see, for example Brown, Armstrong and Thompson<sup>5</sup>) links to work undertaken by Noel Entwistle and others<sup>6</sup> on approaches to learning. The context here is that Entwistle's *deep* approach to learning is associated with intrinsic motivation, whereas the *surface* approach, or perhaps the *strategic* approach, is associated with extrinsic motivation. That is, students who wish to learn for its own sake are more likely to plumb the depths of understanding whereas those who are using the qualification in order to improve their employment prospects are more likely to learn simply what is required to pass the exams. Indeed, Newstead<sup>7</sup> suggests that the extrinsically motivated learners are more likely to cheat.

Other work on learning and teaching styles (see, for example, Tomkinson<sup>8</sup>) raises issues about mismatches in the styles of teacher and learner affecting the learning process.

The issue here is to ensure that both staff and students recognise that there are different approaches to learning. This means that students need to recognise, in advance, what the predominant styles are likely to be in their chosen programme and, if necessary, adapt their styles to match. Equally, staff need to be aware that student progress may be impeded not simply because students are lazy or 'thick' but because they find it difficult to adjust to the teaching style of that member of staff.

Motivation is often thought to be greater in more participative learning environments, both because of the sense of 'belonging' and also because students develop a feeling of being heard and, thus, valued.

### **Developing a strategy**

#### Devising a strategy

Figure 1 gives an outline of the elements involved in producing a strategy. In this instance the 'environment', in terms of national pressures, has been key. But it is vital to bear in mind the relationship of a retention strategy to other strategies and to the corporate plan, if it exists. Also, it is important to examine what is currently happening – the position statement.

#### UMIST's approach to wastage

UMIST's approach to issues of retention has been to build a consideration of wastage rates into an annual cycle of academic audit. For each department, statistics are drawn up showing wastage rates compared with both the institutional average and also that department's previous figures. Where either of these gives cause for concern the department is visited by a team from the Educational Standards Committee to try to identify both underlying causes and an approach to remedy them. However, correctly identifying underlying causes is never easy and it is sometimes unclear whether the remedial action has produced a decline in wastage or whether this might have happened anyway!

The principal areas of root problems identified fall into three overlapping categories: students undertaking a programme that is inappropriate for them; problems in assessment and problems in student support.

#### The 'wrong' programme

Students may be on the wrong programme for a number of reasons. The subject matter may not be what they expected – particularly if they arrived through clearing. The content of the course may be inappropriate for their background or experience – for example, a higher mathematical content. The programme may be right but at the 'wrong' institution – problems of moving from a city area to a 'campus' university, for example. The programme, or individual modules, may also be 'wrong' because of a mismatch in expectations of students and staff. A simple illustration of this was in the mathematical abilities of students. Teaching staff increas-

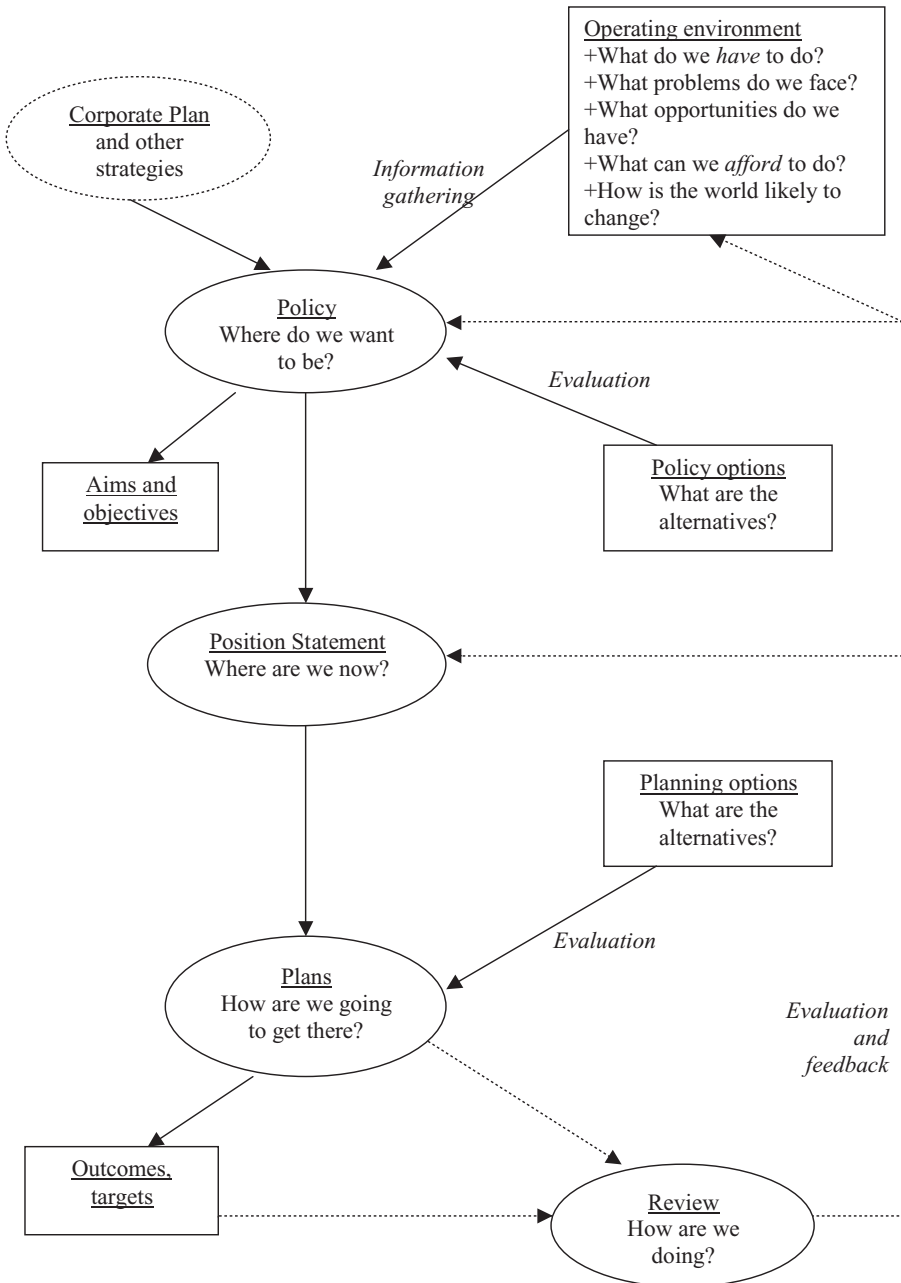


Fig. 1 Devising a strategy.

ingly complain about the lowering of standards and the inability of students to do even the simplest of mathematical tasks. When we looked at this, we discovered that staff often had a false picture of what is actually contained in the 'A'-level syllabus. Many of us hark back to our own study days and have quite false perceptions of modern syllabuses. A seminar looking at the various options in mathematics 'A'-levels proved enlightening to many staff (not least the Mathematics Department) about what they could expect as 'core' knowledge. We have since repeated this in the light of Curriculum 2000. However, the degree of mathematical skill and awareness imposed by teaching programmes which are heavily geared to frequent assessment remains to be determined and will require more rigorous monitoring in the immediate future. Currently we are also undertaking a project, funded in part by the LTSN for Physical Sciences, which will look at the practical scientific skills that students possess on entry.

Two themes emerge from this. First, ensuring that staff and student expectations are aligned and, following from this, making sure that recruitment procedures match the right students to the right course. The focus for activities so far has also been two-fold. Departments have been reviewing their Open Days and two departments have started to provide training for staff who are dealing with potential students. In the Chemistry Department, some innovative approaches to Open Days have been taken including a group-work task and also involving parents. However, caution has to be taken in order to ensure that the Open Days do not lead to false expectations.

To try to overcome the potential mismatches of expectation, the Materials Science Centre has built into a revised induction programme a module that looks at materials science as a whole.<sup>9</sup> This enables students to see the individual modules in context and provides an opportunity to develop a common community of understanding. The induction is an assessed module, which is worth 10 credits, and includes a case study, group work, laboratory exercises – for example thinking about appropriate materials to take a dental impression for teeth lost in a cycling accident – library visits, guidance on study skills and personal tutorials. Student response has been very favourable and the induction is perceived, by staff and students alike, to be a positive contribution to the first year.

### Problems in assessment

Two themes have been identified in addressing the effects of assessment on retention; the effects of formative assessment and the effects of summative assessment. One of the comments that has come back to us from students has been that the quantity, quality and timeliness of feedback has given rise to difficulty in students' ability to gauge what is required of them. Put crudely, the students have no idea what is expected of them when they come to an examination or an assessed piece of coursework. The first thought was to institute a university-wide assessment policy, but this has been discounted in favour of a move to require departments to produce their own strategies. During the coming year, it is intended that the Teaching and Learning Support Centre will discuss assessment regimes with departments with a view to producing guidance on departmental policies. This would include not only

modes of assessment but, for example, a requirement for a maximum time to be set by which the marked work should be returned.<sup>10</sup>

### Problems in student support

One area of concern for some time has been that wastage might be reduced if earlier or more appropriate action had been taken. This concern overlaps with some of the problems of student mismatch, since effective tutorial support can help to pick up this type of problem and sometimes alleviate it. Problems in student support, as it impinges on student retention, fall into two groups. These can be regarded as problems of quantity and quality. In UMIST, the structuring of tutoring sessions is very much a question of departmental, rather than central, policy. This means that some departments leave it to the individual tutor to arrange tutorial sessions with the consequence that tutorials may not take place unless tutees request it. As an example, in one department a concern about student failure rates was met with a more structured approach to personal tutorials with regular and frequent sessions. Absence from lectures was noted and fed into tutors and failure to attend tutorials was taken up by the programme director. These changes were followed by an improvement in both attainment and wastage rates. The staff involved felt that the improvement was due to increased vigilance on their part leading to students focussing more on the demands of the course, but more subtle relationships may have come into play.

In qualitative terms, the concern has been that tutors have been inadequately briefed for their role and this has led to some of them treating personal tutorial sessions as academic tutoring sessions. This has meant that personal problems, such as finance, adjustment, homesickness, relationships etc have not been detected and have been allowed to impede academic progress until a crisis has occurred. Two approaches have been taken to enhance the situation. First, an introduction to personal tutoring is built in to the initial session on the academic practice course and this is mandatory for all academic staff who have not taught before. Established staff can pursue a University of Manchester-based accredited programme. Second, proposals are in hand and pilots undertaken for linking PDPs (personal development profiles) to the personal tutoring system thus providing some additional structure for tackling the issues.

### Towards a strategy

Having identified a number of different strands and initiatives, how then do we weave this into a coherent strategy? At this point, it is important to emphasise the tentative nature of what follows; as yet UMIST does not have a student retention strategy.

#### Where does a student retention strategy fit in?

One of the dangers in today's university is that of strategy overload and we must see a strategy for the retention of students in the wider context. We believe that this should eventually form part of the teaching and learning strategy, because it should

represent best practice in a wide spectrum of learning and teaching. However, to get things started a separate document is probably necessary. We also believe that there are links to the widening participation strategy although, for reasons similar to those enunciated above, we believe that this should also eventually form part of the teaching and learning strategy. In particular, we have to make sure that attempts to embrace a more diverse intake of students do not cause an exacerbation of existing problems of student retention.

### What are the elements of a strategy?

The issues of student retention are complex and, in order to define a strategy, it is necessary to reduce the number of dimensions. Our first thoughts were to choose a time-line as the basis for consideration. In practice our ideas centred on the point at which a student enters university as the origin for the time-line, moving out from that start in both directions. However, a more conventional chronology is safer!

#### *Starting at school*

For those of us concerned primarily with students in science and engineering, the problems of student motivation start back in the early school days. If we are to be successful at recruiting and retaining a sufficiently high number of students, we need to foster a positive attitude towards scientific and technical subjects at a young age. In many cases, the problem is compounded by a lack of teachers who are themselves accomplished in mathematics, science and technology as well as positively disposed. The WISE (women into science and engineering) initiative was designed to interest more female students in studying scientific and engineering subjects but our experience is that it has so far failed to deliver. The main reason for this has been that the young females who have attended are already committed to science or engineering before they take part. One element of a future strategy must be to move this type of activity to earlier years so that we can capture the imagination before choices have been made. We might also look to other activities with schools that can heighten the youngsters' interest in higher education as well as in science and engineering. This might use student ambassadors or share the efforts of the professional bodies.

#### *Managing the transition*

Links with schools do not end with the process of firing the imagination. Primary schools tend to have strong links with secondary schools in order to ensure a smooth transition and this process is often continued in the transition from school into sixth form, or FE, college. Hitherto, universities have eschewed the idea of forming links with 'feeder' schools and colleges. This is primarily because the more established universities traditionally recruit from a national, rather than a local, constituency. In The Netherlands, the University of Amsterdam has been working to promote good relations with local high schools even though many of their students will choose to study elsewhere. This model has the potential to gain some acceptance here in the UK.

Many youngsters are unprepared for the types of learning that are provided in higher education and this can easily lead to a mismatch of expectations. In the past, this has been seen as a problem for universities but there is scope for setting this in

the context of transition from secondary to tertiary education and involving schools and colleges in the process. As universities increase the variety of approach to teaching and learning, so it becomes more important for schools and colleges to gain an understanding of the different approaches and to advise their pupils as to appropriate programmes for their individual learning needs.

### *Recruitment and retention*

The key issue, whether it involves links with schools and colleges or not, is that of ensuring that those who are recruited will be in a position to take advantage of the opportunities that a particular university offers. This does not mean that we should set our stall in terms of the latest marketing ‘hype’; we should, rather, present a realistic picture of our expectations of the student and also enter into dialogue with students to ensure that what we provide can meet their expectations. Any student recruitment strategy has to reflect the student retention strategy and vice versa.

Likewise, it is important that our recruitment activities reflect the nature of the programmes offered. For too long we have taken a self-important view of the selection process and subjected candidates to ‘interviews’ when we have little choice but to accept them. If we are moving to context-based, small-group teaching then maybe our recruitment events should reflect that: the Faculty of Medicine at the University of Manchester goes to considerable lengths to make potential students aware of the nature of its problem-based learning course, yet they still find students arriving with little conception of what they are to encounter. As more engineering courses head down this track, we need to ensure that students are fully aware of what it is they are committing to. But that does not excuse the more traditional format; here too we must make it abundantly clear at the point of recruitment how students will be expected to learn.

A special case is likely to be that of expectations in terms of specific subjects. As stated above, the mathematics curriculum has hidden a variety of syllabuses and we need to be aware of any mismatches between staff expectations and student performance. With the disruption caused in the introduction of Curriculum 2000, particularly with ‘AS’ mathematics, we may expect fewer students to be offering mathematics, in the future, at either AS or A2 level and this may cause us to look again at both our recruitment policies and also our syllabuses.

### *Settling in*

Opening a programme with a two-hour lecture on thermodynamics must hit hard at the motivation of even the hardest of students. Not only do we need induction programmes that will speak to the basic needs of students, help them to settle in and give them a sense of belonging, but also the introduction to the programme needs to be carefully planned to meet their needs. Particularly for those who, in Pask’s<sup>11</sup> terms, are *holist* learners we need to pay particular attention to giving an overview of the programme, and subject, to help them to relate individual sessions to the wider picture. Increasingly we will be moving to PDPs as part of the student’s record of achievement and the induction sessions could prove a vital element in getting these

running. Hopefully, they would also provide the impetus for some initial reflection on the student's part! Induction, both personal and academic, must be an element of a student retention strategy.

### *Keeping up the good work*

We noted earlier the idea that a hierarchy of need might affect motivation. The new student may be facing a barrage of anxieties that erode motivation to the higher order aspects of learning. Finance increasingly proves a worry to students as well as issues of security and of developing relationships with a new group of companions. We ignore these personal issues at our peril. For this reason, any retention strategy needs to embrace policies for student support and for personal tutoring. Included in this may be schemes for student mentoring, or other means of peer support, and the use of alumni to provide a bridge between academe and employment.

### **What next?**

Having identified an approach to a strategy and some of the good practice that can help to underpin it, we now have two further steps to take. First, we have to convince our colleagues that the strategy is necessary and desirable, not simply another piece of bureaucracy. Then we have to move through the laborious process of drafting, consulting and re-drafting. We also need to work with existing and potential student-led initiatives. The result will be of benefit to staff and students alike.

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