

# The impact of training of university teachers on their teaching skills, their approach to teaching and the approach to learning of their students

GRAHAM GIBBS *Oxford University, UK*

MARTIN COFFEY *University of Leicester, UK*

**ABSTRACT:** This article reports a study on the effectiveness of university teachers' training involving 22 universities in 8 countries. A training group of teachers and their students were studied at the start of their training and one year later. A control group of new teachers received no training and both they and their students were studied in the same way. Evidence is reported of changes over time relating to three measures: (i) student ratings of their teachers using six scales from the Student Evaluation of Educational Quality questionnaire (SEEQ) and the 'Good Teaching' scale of the Module Experience Questionnaire (MEQ); (ii) the extent to which teachers described themselves as teacher-focused and student-focused in their approach to teaching, using two scales from the Approaches to Teaching Inventory (ATI); and (iii) the extent to which these teachers' students take a surface approach and a deep approach to learning, using two scales from the MEQ. The article reports evidence of a range of positive changes in teachers in the training group, and in their students, and a

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contrasting lack of change, or negative changes, in untrained teachers from the control group.

KEYWORDS: approaches to learning, evaluation of teaching, teacher training, teaching effectiveness

## Introduction

Initial training of university teachers is now established in every university in the UK, Norway and Sri Lanka and is becoming increasingly common in many other countries. From being small in scale, low in credibility and poorly supported, substantial training of 120–500 hours duration is now well embedded in many institutions, is often compulsory and is sometimes linked to probation or tenure. Increased confidence in the value of such training has not, however, been based on solid evidence. Reviews of research into the training of university teachers have concluded that there is little evidence regarding the impact of training on teaching and even less evidence of impact on student learning (Gilbert and Gibbs, 1999; Weimer and Lenze, 1997). Such evidence as exists tends to involve self-reports of change from teachers, either through ad hoc programme evaluation questionnaires or through group discussion and interview. Studies tend not to obtain evidence from theoretically or psychometrically based questionnaires, obtain evidence from students or obtain evidence about impact on student learning, which is the ultimate purpose of training. This is the first published study that combines psychometric data from a number of training programmes and includes a control group so as to be able to measure impact.

The term ‘training’ may summon up images of military drills, but in practice the training of university teachers often involves relatively sophisticated processes underpinned by theoretical models of professional development (Schon, 1987) and change over time in teachers’ conceptions of teaching (Trigwell et al., 1994). Trainers are often articulate about what they are trying to achieve and sophisticated about their training methods, even if they are not yet sophisticated about finding out whether they are successful.

A framework for analysing the goals and rationales of training programmes, developed by Gibbs and Coffey (2000) from in-depth interviews with trainers, has identified a range of training goals. This article is concerned with the extent to which training is capable of achieving three of these goals:

- the improvement of teachers’ skills;
- the development of teachers’ conceptions of teaching and learning;
- consequent changes in students’ learning.

Other common goals of training, such as developing teachers' ability to reflect and be self-improving, or to increasing self-confidence or self-efficacy, were not studied.

Much training is explicitly oriented towards developing teachers' teaching skills, especially their classroom practice. Measures of teaching behaviour have been shown to correlate with various measures of learning outcome. A well-developed and widely used American student feedback questionnaire was selected which concentrated on 'low inference' teaching behaviours, in order to increase reliability, and which has been shown to correlate with learning outcomes: the Student Evaluation of Educational Quality (SEEQ) (Marsh, 1982).

Some trainers are primarily oriented towards improving student learning, rather than towards improving teaching, and so their training is oriented towards changing teachers so that they, too, are oriented towards student learning rather than towards teaching as performance. Trigwell et al. (1974) described different 'approaches' that teachers take towards teaching. They have identified two main approaches: Teacher Focus (in which the teacher is concerned primarily with the organization, presentation and testing of content and their own teaching behaviour, with the goal that students acquire information) and Student Focus (in which the teacher is concerned primarily with supporting student learning, so that they acquire or develop concepts).

A teacher's approach to teaching has been shown to relate to the approach to study of their students: student-focused teachers are more likely to have students who take a deep approach (attempting to make sense of content) rather than a surface approach (attempting to remember content) (Trigwell et al., 1999). Students who take a deep approach have been shown, in a wide range of studies, to have superior learning outcomes, particularly in terms of understanding and developing new and more sophisticated conceptions of the subject. When trainers are oriented towards changing the teachers' approach to teaching they can, therefore, have a reasonable expectation that, if they are successful, this will improve both student learning processes and outcomes. In a detailed study of a training programme designed explicitly to change teachers conceptions of teaching, Angela Ho has demonstrated this chain of influence through training goals and training processes, to teachers' approaches and to their students' approaches (Ho et al., 2001).

This article reports a three-year international study of the training of university teachers which is concerned with identifying any changes in teachers' behaviour and approaches to teaching and their students approach to learning, which could be attributed to the training.

## Method

Following a substantial pilot involving in-house in-service training programmes for university teachers in 10 universities in England, in 1998/99, a larger scale study was conducted in 1999/2001 involving 20 universities in 8 countries. Each university had a training programme that was at least 60 hours in duration (the longest being about 300 hours). These programmes were coherent series of meetings and learning activities spread over a period of 4 to 18 months, usually with an element of formal assessment. Many were also Postgraduate Certificate courses subject to formal academic approval and quality assurance including, in the UK, external examiners' scrutiny of assessment standards. Most programmes were for teachers near the beginning of their teaching careers although some also included more experienced academics, and some included post-graduate teaching assistants with limited teaching experience. Each of the trainee teachers on these programmes had concurrent teaching and their own students. Universities wishing to be involved in the study that had a less substantial programme involving, for example, a loose collection of free-standing training workshops, were excluded. The programmes studied had very varied goals, rationales and training processes.

All but two of the universities involved were visited and the authors met the trainers and trainee teachers to explain the research process and elicit their commitment. This article reports the administration of three questionnaires: one to the trainee teachers and two to their own students. Each questionnaire was administered twice: once as near as practicable to the start of the training and the trainee teachers' own course, and once approximately one year later, after the training was complete. The student questionnaire was administered to students on a trainee teachers' course at the start, and, where possible, to different students on the same course, at the same point in the course, one year later. These were, therefore, different students but studying the same course taught by the same teacher.

The first of the two questionnaires administered to students was the SEEQ. A subset of six scales from the SEEQ has been validated for use in the UK by the authors (Coffey and Gibbs, 2000). Five of the scales concern skills, listed here with a typical questionnaire item to illustrate each scale:

Enthusiasm: The teacher was enthusiastic about teaching the course.

Organisation: The teacher's explanations were clear.

Group interaction: Students were invited to share their ideas and knowledge.

Rapport: The teacher had a genuine interest in individual students.

Breadth: The teacher contrasted the implications of various theories.

A sixth scale was selected as it concerns impact on students:

Student learning: The students learned something which they considered valuable.

The second of the questionnaires administered to students was the Module Experience Questionnaire (MEQ) developed from the Course Experience Questionnaire (Ramsden, 1991) used very widely in Australia. Data from use of the following three scales of the MEQ are reported here, each illustrated with a typical item:

Surface Approach: When I'm reading I try to memorize important facts which may come in useful later.

Deep Approach: I generally put a lot of effort into understanding things which initially seem difficult.

Good Teaching: The lecturers were extremely good at explaining things.

The questionnaire administered to the trainee teachers was the Approaches to Teaching Inventory (ATI; Trigwell, unpublished). This questionnaire has been validated for use in the UK by the authors (Gibbs and Coffey, under review). The ATI measures the extent to which teachers have Teacher-Focused and Student-Focused approaches to teaching. Sample items include:

Teacher Focus: I feel it is important to present a lot of facts in classes so that students know what they have to learn for this subject.

Student Focus: In lectures in this subject, I use difficult or undefined examples to provoke debate.

Teacher Focus and Student Focus are independent scales (just as Surface Approach and Deep Approach are independent scales and not opposite ends of a single scale), and it is possible for a teacher to score highly on both scales at the same time.

The questionnaires for the trainee teachers were administered by the trainers: normally educational development staff in a special centre or unit concerned with pedagogy. The questionnaires for the students were administered by the trainee teachers themselves. Questionnaires were anonymized with codes and returned to the authors at the Open University. The questionnaires were machine read, data were collated and an individual report produced:

- for each trainee teacher, showing their own scores, the average scores of their fellow trainee teachers on their programme, and average scores of all trainee teachers in the study;
- for each trainer, showing the average of the scores of their trainee teachers and the averages for all other training programmes.

It was, in some cases, possible to visit the institutions involved to explain and discuss results with those involved.

### **Sample and control group**

It was intended to involve 20 trainee teachers from each of 20 universities (i.e. 400 trainee teachers) and to obtain data from 20 students for each of these trainees. Despite much communication and organization, and many visits, the total sample of trainees at the start was 235, because recruitment on the training programmes was lower than 20 in some cases; one university was excluded from the sample because all the 'trainee' teachers were already very experienced. Because of drop-out from the programmes, and other difficulties, the total sample of trainee teachers providing full data for the ATI one year later was 104.

A control group was included which consisted of newly appointed teachers at two universities at which there was no training or organized support for new teachers. The teachers involved in this control group, and their students, were administered the questionnaires in the same way as the training group – near to the start of the first year of teaching and one year later. It proved difficult to identify universities that could provide a control group and even more difficult to gain and retain commitment to being involved in the study. The control group is therefore small, with the number of teachers equivalent to 2 of the 20 training programmes involved in the study.

There were differences between the control group and the training group for some 'before' mean scale scores on the SEEQ – for example, the control group had relatively high 'Enthusiasm' scores on the SEEQ. However, there were also differences between universities within the training group. These may have reflected different cultural and linguistic patterns in responding to the questions – after all five different languages were involved and only one country translated the questionnaires from English into their own language. These inter-university differences in absolute scores are hard to interpret. For the analyses undertaken below all the training group data are combined. With only two universities in the control group too much should not be read into any differences in mean scale scores between the control group and the training group. What matters here are any differences between the control and training groups in terms of the size or direction of change between before and after scores, rather than differences in absolute scores before or after.

The control group was compared with the training group to check that they were not different at the start of the year being studied (e.g. as a consequence of teaching in a different institutional environment). The control group did not differ from the training group either in their Teacher Focus scores or Student Focus scores at the start of training ( $t = 0.57$  and  $1.58$ , respectively, not significant [n.s.] in each case). A check was also made to ensure that the students of the teachers in the control group were not

different from those of the teachers in the training group. The approach to study of the students taught by teachers in the training and control groups did not differ at the outset (Deep Approach:  $t = 0.24$ ; Surface Approach:  $t = 1.72$ , n.s. in each case).

## Results

### Approach to teaching

Training group scores on the two scales of the ATI (Teacher Focus and Student Focus) were calculated and compared before and after training. It can be seen from Table 1 that the training group became less Teacher Focused and more Student Focused by the end of the training. The before–after difference for Student Focus scores was statistically significant. The maximum score on each scale is 40.

It is possible that those trainee teachers who completed the training and contributed to the ‘after’ data were different from those that did not contribute to the ‘after’ data, for example, in their motivation to improve their teaching. The approach to teaching, before the training, of completing and non-completing trainee teachers, was therefore compared. No differences were found in either Teacher Focus or Student Focus scores ( $t = -0.78, -1.70$ , respectively, n.s. in each case).

As a second check on the validity of the ‘after’ data, a comparison was undertaken of matched pairs of before and after data just for those trainee teachers who completed the ATI both before and after training (see Table 2).

Table 2 displays an almost identical pattern of change to that for the entire training group, so there does not appear to be any difference between those who provided both before and after data and those who did not. All

**Table 1** Approach to teaching before and after training of the entire training group

	<i>Teacher Focus</i>			<i>Student Focus</i>		
	<i>Mean Score</i>	<i>SD</i>	<i>N</i>	<i>Mean Score</i>	<i>SD</i>	<i>N</i>
Before	22.6	5.7	219	26.4	5.5	224
After	22.1	6.3	104	28.3	5.8	104
Change	-0.5			+1.9		
<i>t</i>	0.71			-2.87		
<i>p</i>	n.s.			<.005		

**Table 2** Approach to teaching before and after training of matched pairs of before and after data from the training group

	<i>Teacher Focused</i>			<i>Student Focused</i>		
	<i>Mean Score</i>	<i>SD</i>	<i>N</i>	<i>Mean Score</i>	<i>SD</i>	<i>N</i>
Before	22.5	5.9	97	25.8	5.8	99
After	21.8	6.5	97	28.2	6.0	99
Change	-0.7			+2.4		
<i>t</i>	-0.87			4.15		
<i>p</i>	n.s.			<.001		

analyses reported therefore include all teachers in the training group, whether or not they contributed both before and after data.

In contrast to the training group, the teachers in the control group, who experienced no training, changed in the opposite direction: they became more Teacher Focused and less Student Focused (see Table 3), though these changes were not significant due to the small sample size.

As stated above, the control group did not differ significantly from the training group at the start. However, one year later they did differ, being significantly less Student Focused than the training group (Table 4).

Figure 1 plots the above data and shows:

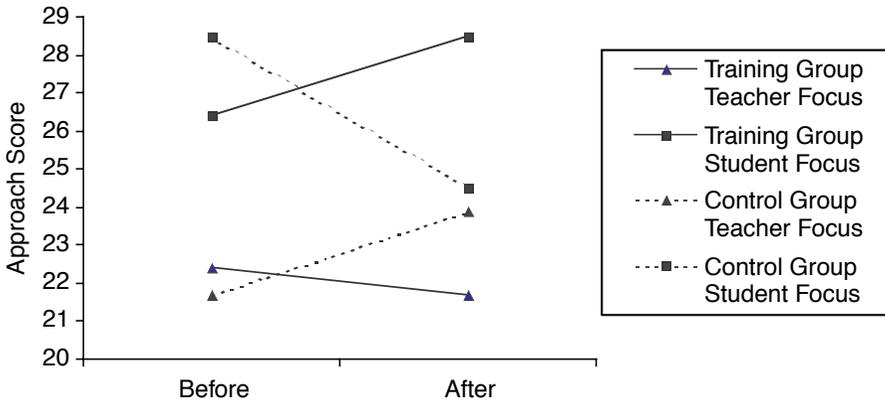
- the changes in the approaches to teaching of the training group between the start of training and one year later;
- the contrasting changes over time in the untrained control group.

**Table 3** Approach to teaching of the control group at the start of teaching and one year later

	<i>Teacher Focused</i>			<i>Student Focused</i>		
	<i>Mean Score</i>	<i>SD</i>	<i>N</i>	<i>Mean Score</i>	<i>SD</i>	<i>N</i>
Before	23.2	7.7	16	28.7	6.5	17
After	23.9	7.7	10	24.5	6.4	10
Change	+0.7			-4.2		
<i>t</i>	-0.23			1.60		
<i>p</i>	n.s.			n.s.		

**Table 4** Comparison of the approach of the training group and control group after one year

	<i>Teacher Focused</i>			<i>Student Focused</i>		
	<i>Mean Score</i>	<i>SD</i>	<i>N</i>	<i>Mean Score</i>	<i>SD</i>	<i>N</i>
Training group after	21.7	6.4	113	28.5	5.8	113
Control group after	23.9	7.7	10	24.5	6.4	10
Difference	+2.2			-4.0		
<i>t</i>	-1.0			2.08		
<i>p</i>	n.s.			<.05		

**Figure 1** Approach to teaching scores of the training group and control group, before and after training

### Teaching skills

The training and control groups' scores on the five scales of the SEEQ, which concerned teaching skills, were compared before and after training (Table 5). The training group's scores improved significantly on all five scales. In contrast, the control group's scores did not change significantly except for the scores for 'Group Interaction', which worsened significantly. Scores on the other four scales improved for the control group, although not significantly so, and less, on every scale, than for the training group. The maximum score on each scale is 30.

One scale of the MEQ concerned 'Good Teaching'. Although the 'Good Teaching' scale score increased significantly for the training group ( $t = 3.21$ ,  $p < .01$ ) this was not the case for the control group ( $t = 0.09$ , n.s.).

**Table 5 Comparison before and after SEEQ scale scores from the training group and control group**

<i>SEEQ Scale (Group)</i>	<i>Mean Score</i>	<i>SD</i>	<i>N</i>	<i>t</i>	<i>p</i>	<i>Change</i>
Enthusiasm (Training Group)				5.10	<.001	Better
Before	15.1	3.2	1633			
After	15.8	3.5	640			
Enthusiasm (Control Group)				1.87	n.s.	Same
Before	16.1	3.2	334			
After	16.7	3.5	148			
Organization (Training Group)				6.94	<.001	Better
Before	14.9	2.9	1618			
After	15.5	3.0	631			
Organization (Control Group)				0.41	n.s.	Same
Before	15.5	3.0	332			
After	15.9	3.1	141			
Group (Training Group)				3.23	<.01	Better
Before	15.5	3.6	1637			
After	16.1	3.5	634			
Group (Control Group)				2.53	<.05	Worse
Before	15.2	3.9	327			
After	14.2	4.2	148			
Rapport (Training Group)				6.41	<.001	Better
Before	15.9	3.1	1597			
After	16.5	3.2	612			
Rapport (Control Group)				0.30	n.s.	Same
Before	16.3	3.2	314			
After	16.4	3.1	136			
Breadth (Training Group)				7.44	<.001	Better
Before	14.6	2.9	1586			
After	15.3	3.0	627			
Breadth (Control Group)				1.72	n.s.	Same
Before	15.2	3.0	314			
After	15.7	2.6	136			

### **Students' learning and approach to study**

One scale of the SEEQ concerned Student Learning. The training group's scores on this scale increased significantly while the control group's scores were unchanged (Table 6).

The Deep and Surface Approach scores of the students of the trainee teachers in the training group were examined to see if the changes reported

**Table 6** SEEQ 'Learning' scale scores, before and after, of the training group and control group

SEEQ Scale (Group)	Mean Score	SD	N	t	p	Change
Learning (Training Group)				7.08	<.001	Better
Before	14.9	2.8	1641			
After	15.7	2.9	636			
Learning (Control Group)				0.07	n.s.	Same
Before	15.8	2.8	339			
After	15.9	2.8	141			

above in teachers' approach was reflected in changes in their students' approach (Table 7).

As can be seen in Table 7, students took a surface approach to a significantly lesser extent after their teachers had been trained. However, although they took a deep approach to a greater extent, this change was small and not significant. Possible reasons for this relative lack of change in students' approach include:

- a ceiling effect: deep approach scores were already high at the start (the maximum score being 30);
- a delay before changes in teachers' approach to teaching can significantly affect their students' approach to study. Changing courses in such a way that students' approach to study is significantly changed can be difficult for new teachers, even if they understand what is required and wish to make these changes, because they lack authority to make such changes, particularly to assessment arrangements, and because such changes may require formal approval and more time to implement.

**Table 7** Student's approach to study before and after their teachers had been trained

	Surface Approach			Deep Approach		
	Mean Score	SD	N	Mean Score	SD	N
Before	18.5	4.3	840	21.7	3.6	812
After	17.5	4.5	523	22.0	3.5	519
Change	-1.0			+0.3		
t	4.0			-1.5		
p	<.001			n.s.		

In contrast, there was no change in the approach to study of students of teachers in the control group, who received no training (Deep Approach:  $t = 0.19$ ; Surface Approach:  $t = 0.70$ , n.s. in each case).

## Discussion

The data presented here provide support for the following conclusions:

- Training can increase the extent to which teachers adopt a Student Focus (as measured by the ATI). Without the support of training, teachers may move in the opposite direction and reduce the extent to which they adopt a Student Focus. A Student Focus approach is known to be associated with students taking a deep approach to a greater extent, and hence to improved quality of student learning outcomes, and so this is an important finding.
- Training can improve a number of aspects of teachers' teaching, as judged by students (measured by five scales of the SEEQ and the 'Good Teaching' scale of the MEQ). Without the support of training, changes may be insignificant or (as evident in the SEEQ scale 'Group Interaction') negative.
- Training can change teachers such that their students' improve their learning (as measured by improved scores on the 'Learning' scale of the SEEQ and reduced scores on the 'Surface Approach' scale of the MEQ, though trained teachers' students did not significantly increase their Deep Approach scale scores). Without the support of training no such positive change in student learning is evident.

Whereas the positive impact of training is easy to understand, the sometimes negative impact of no training requires some explanation. Interviews with trainees in several institutions revealed a marked difference in attitudes and values between their academic departments and the training programme. On the training programmes teaching was seen to be valued and the improvement of teaching encouraged. Innovation and change were supported and openly discussed. In contrast trainees reported that in their departments teaching was often not valued and that there was pressure to conform to largely teacher-focused teaching conventions (such as didactic lecturing and testing of acquisition of subject content). Change was sometimes frowned upon and taken to imply criticism of more experienced colleagues. The training programme provided a kind of 'alternative culture' that counter-balanced the negative influences of the culture of teachers' departments. In the absence of a training programme this negative influence of departments went unchecked. If this explanation is plausible it would justify such training taking place at the very beginning of a teacher's career,

rather than some years later, as happens in some institutions, in order to avoid the development of negative values and a Teacher Focus early in a teacher's career.

The institutions studied that provided extensive initial training often also provided other forms of support for teachers, such as discussion of student feedback, seminars and conferences on teaching, departmental mentors, generally more positive attitudes to teaching and even the prospect of reward and promotion for excellent teaching at some time in the future. These and other forms of support and encouragement may well have contributed to the positive changes in the teachers identified in this study. We are still not in a position to demonstrate that that it was the training itself that resulted in the positive changes, merely that those institutions that had training also had teachers who improved.

An attempt was made to categorize the type of training used in each institution according to their espoused goals (such as improved teaching skills or developing more sophisticated conceptions of teaching) and to see if different types of training could be identified as having different outcomes, as measured by the tools used in this study. However, this proved impossible because:

- most training programmes claimed to have multiple goals, and used varied training tactics, so it was impossible to categorize any programmes as having a single distinctive rationale or process;
- there was insufficient data from most individual programmes to identify significant differences before and after, or to distinguish between the achievement of different goals.

It might be argued by teacher accreditation bodies, such as the ILT, that the data reported here validates the accreditation process – after all, teachers who completed accredited programmes were demonstrably better than those who undertook no such accredited training. However, the majority of current ILT members have achieved their accredited status by 'direct entry' – they are experienced teachers who did not undertake training at the start of their careers but who have presented a brief portfolio of evidence of competence for accreditation. It is not yet known whether these ILT members are as effective as teachers, as indicated by the measures used here, as the much less experienced training group, or whether they are only as effective as the untrained control group. There was insufficient data to compare with the impacts of accredited and unaccredited programmes.

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## Biographical notes

GRAHAM GIBBS is Director of the Institute for the Advancement of University Learning, at the University of Oxford and was previously Professor and Director of the Centre for Higher Education Practice at the Open University. He has been involved in designing, running and evaluating programmes for new university teachers since 1980. He has visited comparative programmes in many universities in many countries and has published comparative studies of national practices. He has been concerned with strategy and policy about improving university teaching, at both a national and institutional level.

*Address:* Institute for the Advancement of University Learning, Oxford University, St. Ebbes, Oxford, UK. [email: graham.gibbs@learning.ox.ac.uk]

MARTIN COFFEY is a Chartered Occupational Psychologist who combines working on a freelance basis, with a half-time post as a Lecturer in Occupational Psychology at the University of Leicester. He teaches exclusively on distance learning programmes. Following from his research into the benefits of educational development programmes, with Professor Gibbs, his current research interest is in the development and evolution of teams in academic settings.