Aspects of effective mentorship in the design and technology classroom

Abstract

This article reports, in part, on a descriptive research project conducted through 1994/1995, on the perspectives of students and their subject mentors as to the most effective approaches to mentoring in the design and technology classroom. It highlights the students' own views on their subject training needs and the way these impinge on the subject mentor's role and its effectiveness.

The article identifies a special relationship that often develops between a student and a 'voluntary subject mentor', a person who offers support to the student in the development of their subject capability as well as in the task of learning to teach. The main findings of the research are presented as a series of concluding statements and lead to five recommendations.

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RESEARCH

Introduction

The main student cohort involved in this 1994/5 research project numbered 19 undergraduates all of whom were following a shortened two year BA Design and Technology Degree with QTS and were embarking on a final school placement.

Research data was collected in two stages that had distinctly different purposes. The first, by survey, was designed to measure the expectations and perceptions of the mentor and mentee about the role of the subject mentor within the undergraduate partnership scheme at Middlesex University; the second, by tape recorded, semi-structured interviews, to gain the reflective responses of the mentor and mentee after the final teaching practice had taken place.

The purpose was to establish the most suitable model of mentorship relevant in developing a competent design and technology teacher, a person reaching the end of the pre-professional stage (Vonk 1993) in their early teaching career.

The following is a record of some responses gained from a student and his subject mentor in separate, semi-structured interviews. The extract is chosen because it reflects some commonly held views of others who took part in the interviews. Some comment and analysis accompanies the reported responses.

There was an expectation by the mentor that any student would have reached competent levels in the subject with a particular ability to

> MB "be able to make things and use wood, metal, plastic, textiles and food and that they should have a secure design background as well as sound skills in presentation technique."

It was also assumed that they would have a good regard for discipline and for preparation for lessons.

In areas of identified subject weakness, "the student could expect 100% support and we would be happy to teach the student aspects of the subject."

In this placement such support was given to the student who was recognised to be a very competent teacher but who lacked knowledge and skill in the textiles area. The demand to teach in this area arose out of the school's design and technology teaching team's philosophy that each department member should be able to teach across the disciplines within the subject. It seemed evident, however, that not all members of the team conformed to this demand or indeed were capable of doing so. Nevertheless the following student's observations highlight what was seen by him as the very positive benefit of such a demand.

> SB "I was working with a subject teacher who worked in both areas, a lady who works in the textiles area and the CDT area, so it was good because she was showing me how we could interact the two, because we actually developed the scheme of work ourselves... she was doing parasols and was asking for my assistance on the construction of the frame because she had more experience on fabrics – so it was very interactive and, yes, I took a very active teaching role in the

structural design in the unit and she on the fabric design. We were supporting each other."

He highlights the developing relationship of trust and the recognition of each others strengths whilst developing a scheme of work and refers to a feeling of self-esteem in that he could assist an experienced professional. He also benefited, it would seem, by being able to observe this teacher working in this area of specialism.

SB "I was able to (observe the teacher teaching) on many occasions before I was asked to teach it myself. This gave me quite a lot of confidence. I was able to assist her having been shown certain pieces of equipment and techniques."

He was reliant upon the teacher to give subject training in the use of machines and techniques but his special contribution still lay in his area of strength, materials and structures.

In this situation the learning and confidence building process took the form of a series of distinct stages: instruction from the textiles teacher outside the classroom, then observation of her in the teaching situation, the development of a scheme of work in conjunction with her and finally teaching and running the scheme. This reference to 'progressive staging' is in keeping with those models of development suggested by Rothera (1995) and Furlong and Maynard (1995) and gives credence to the need for students to gain good ideas for teaching from others but also to be able to run a scheme on their own.

SB "It was the progressive staging that gave me a lot of confidence as I went through because I'd already familiarised myself with the classes when I'd been working with and supporting the teacher, so I got to know all the pupils within the classes and then I was allowed to take over; but in the lunchtimes and evenings teachers were giving me practice and help on the machinery and equipment and, as I do with anything I'm going to run, I would always make the product that I'm asking the students to make so that I find any pitfalls in that process."

The statement highlights a number of important points. Firstly, there is an initial concern shown by the teacher about knowing the pupils, about knowing 'I've' got control. His concern was about classroom management and discipline.

His concern moved on quickly, however, to the need to be conversant with the subject and the knowledge and skills that must be put over and demonstrated. This concern plays a very large part in building confidence, if it is known and can be rehearsed, or in destroying confidence if uncertainty remains. The substantive knowledge of the subject is not just to do with recall and telling about something, it is actually being able to demonstrate that you can do it.

This raises the question as to how much it might be reasonable for a student to know. Should students be expected to operate outside of their specialism? If they should then there are major implications for the subject mentor in having to train them, and for them in finding the time to learn and rehearse unfamiliar skills and knowledge.

Furthermore, the process model of the subject poses problems in that to be an enabler in design and technology, the teacher needs the broadest of repertory. Few teachers can match this demand and in keeping with DATA's (1995) proposal of basic entitlement in training, it is perhaps sensible to recognise the limitation of adopting a polymath approach.

In this student's particular situation, however, one might judge that he had benefited greatly from the new demand but might understand that he had a self-confidence in other areas of the subject which supported his ability to 'find the time for rehearsal and further training'.

The following extracts are taken from a series of semi-structured interviews,

conducted at separate times, with a number of subject mentors and students who were taking part in the project. Some comment and analysis accompanies the reported responses.

Expectations of competence

Most students identified a personal area of weakness in the subject which was referred to as a lack of knowledge or skill in a specific area of design and technology i.e. electronics, textiles or food. Few of them, however, showed any reluctance to enter these specialist areas and to have a go at teaching in them and, for the most part, this was expected of them by the subject mentors.

One student did feel that, "it is not fair to expect competence in all areas of the subject," (A 319) but another felt, "on this course people don't need to be taught the subject, they already know their subject, they need to be taught how to deliver it...we have to learn how to put it over to the pupils." (H 219)

There was strong support for "the opportunity to take up new work because there would not be the chance to do it at any other time." Some reservations were expressed with this view and were related to the breadth of demand made at a time of teaching practice where there was so much to be done that "you don't have control over preparation." (E 710)

A number of situations arose for students where new teaching demands were being made in relation to the subject and its application to teaching. In this situation it was support, advice and encouragement that lay high on their agenda in order that they could feel confident to tackle the teaching task and, perhaps more notably, it was the need to work collaboratively and in partnership with an experienced professional that dominated the students' concerns.

What seemed significant was that this role of learning to teach and learning to apply the subject was often best fulfilled, according to the students, by a teacher other than the subject mentor. The valuable experiences were found alongside willing, interested and involved teachers anxious to pass on their skills, knowledge and abilities but, it would seem, outside any judgmental framework. In virtually every case the student was enthusiastic and highly positive about this person's contribution to their learning of the subject and its application to the teaching situation.

The benefits were

a) that the students received help on how to plan for work and projects across the subject disciplines

b) that they were able to make a positive contribution to this planning, therefore gaining confidence, esteem and recognition from the experienced teacher

c) individual subject strengths were recognised by each other

d) support for each other was given in areas of subject weakness.

The desire of the students was to reach autonomy and to move toward independence whilst being reassured and supported along the way. Many students had reached a stage beyond mere 'management and control issues' and were now looking for 'good ideas for teaching' (Furlong and Maynard 1995) and in this respect, a critical professional was of paramount importance in helping them develop.

Further observation and comment by a student about relationships with other teachers confirm reciprocity as an essential and key feature in the relationship even though an initial assumption might be that the student cannot match the quality and ability of the seasoned professional.

> "In the textiles class ... she was a semi-retired teacher from in industry, we've done some drawing , we're doing a jacket, and I'm doing it as one of the pupils. I'm sitting in as a pupil, she

shows the class my drawings and said that's where she was weak, and I was really chuffed because I didn't think I could show her anything. She got my presentation sheets and layout sheets out ... that was quite nice because I didn't think I was going to be able to put anything into the lesson really." (C 180)

The student's learning was emanating from doing some project work. She was receiving direct instruction on technique but contributing in other ways to the class and learning process.

In another situation relationships were different because here the student had responsibility for taking charge and teaching the lesson. The class teacher was there while the student was at the front of the class but the teacher did not feel any conflict with a situation in which advice was being sought.

"At the beginning I thought the children might comment, saying that she doesn't know what she's doing but they didn't seem to mind. They didn't make any thing of it. I don't know whether it's the way I said it, "we've discussed it let's double check", so we went to the class teacher. They didn't mind. But I think I would have felt more wary of it if he hadn't have been the way he was because whatever I asked him he didn't care. He didn't make a big deal about it." (E 280)

The teacher accepted the view that the student was not expert in every area and that ongoing support and advice should be given in order to enhance the student's subject competence. Most students felt that seeking advice and having immediate access to the expert was most important when working in an area of weakness but in areas of strength, reassurance of the level of competence should take place as part of the feedback process outside of the lesson.

"I was grateful for his presence but he let me get on with it. He was able to give me feedback without interfering. He wouldn't intervene and looking back on it, that was nice. I did have a couple of wild groups and I had to eventually end up training them myself, which was good." (B 15)

Selecting the voluntary mentor

In many situations students point out that their selection of a mentor was based upon the willingness of that mentor to "offer me time", to take the time to show me how to do some work and make some suggestions about "ideas for putting over the subject and developing projects. This person should also be easy to talk to and a person with common problems about group management and the handling of children and discipline." (R 273)

There was a need to be treated like a colleague and examples arise of close associations with peers; the art teacher (E 510) who was in her first year; another student; the visiting expert in the subject who was inexperienced in the classroom; and the part time teacher "who had been there a long time and knew the classes I was teaching." (W 127)

Such relationships were encouraged; indeed it would seem that subject mentors recognised these informal associations as valuable in removing the burden of instructing as well as judgment and assessment from their shoulders.

Subject competence, subject application and planning for teaching

Particular emphasis was placed on developing teaching schemes and students and mentors alike agreed that advice was needed on the presentation of the subject, not on the subject itself.

But while, from the point of view of the mentor, "planning a series of lessons is useful because it gives them an idea of how we can deliver the subject and deliver certain skills and knowledge through an extended project" (OK 8), some students and mentors were concerned that schemes should not simply be adopted. Such an approach was, "boring and did not give me enough freedom. I was restricted by organised schemes." One mentor forcefully stated that he would not offer a model of planning or plan lessons for the student

because this did not lead to autonomy and independence.

The overriding opinion was that students were in a position to plan projects and that they would have the necessary skills to do so. This level of interpretation by the mentor not only focused on subject knowledge but also on the process-based model of the subject:

> "They should be able to offer, I think, a particular way of working which is the design process itself. I think the most important thing is that they should have a very good grasp of what design and technology is about, not maybe in a context of material knowledge and all that sort of thing, I think, in a way, how design and technology is being delivered, how it should be delivered. ... It's difficult to say what the core knowledge should be: I think core knowledge is a very good understanding of the philosophy of the subject ...It is designing and making, I would say" (OK 5)

It should be noted that subject teaching was given to students in school but subject mentors were often excluded from this process. There seems to be little evidence as to why but a conclusion might be drawn that assessment and formal relationship affect individual perspectives or perhaps it was that promotion of team mentorship was at the heart of the subject mentors' desires. "You can't have just one mentor for all subjects, it's got to be a mentor that creates a team approach with the rest of the members of the department to provide this training and feedback." (OK 13). There was no expectation of the subject mentor being solely responsible for a student's subject learning, development and assessment. "I went to everyone about different things" (BT 19), "Most people in the department are involved, we don't rely on my own judgment; involving the mentoring team ensures greater fairness in judgment." (SC 128)

Observing the mentor teaching the subject

The purpose of observing the mentor teach was clearly not seen as that of an apprentice relationship as described by Stones (1984). Modelling yourself on the teacher was said by Maynard and Furlong (1995) to be a means of going forward but clearly the majority of students rejected any notion of mimicking and copying for competence. Indeed, because of personality differences this was seen to be virtually impossible by a number of students.

> "My subject mentor knew his subject, his delivery was unique... because the personality of this particular person was unique, it was very interesting to find that instead of the stand up and talk and chalk approach you could have this totally over the top, extrovert approach and still hold the pupils' attention. It was fascinating to what extremes you can go without, I would add, being dangerous or any thing like that... the pupils responded to it. I take it that this type of approach can be developed over many years, but I'm sure you can't just walk in and do this as a student, you have to know the class... It showed me another form of delivery that would hold a class." (H250)

A mentor also pointed out difficulties in modelling the 'expert'. "You can't model yourself to the way I teach because my teaching is developed from my own character. If you try to do things the way I do they may not work with you and I think he needs to be aware of that as well." (O23)

The value of observing the mentor would seem to be born out of the need to find 'myself' as a teacher; to understand that each of us is fallible at times; that the nature of teaching is such that mistakes and shortcomings can be understood and accepted by the pupils. This should not be viewed as a weakness in the overall context of competent teaching. "That's one of the things I found so helpful with the subject mentor that he made mistakes and he knew he had made mistakes, he was quite honest about it, he didn't try and present himself as perfect." (W 150)

Extending your 'framework' and repertory was also important and being able to reflect upon the value of what you were teaching and the way you were teaching it were strong in student comment.

> "Exactly the same lesson, the same you did yesterday, but now he's doing it, with another group, different day, different time of day, everything is different and it's interesting that at the end of the day we basically taught them about the same thing but in a completely different way, and that was great...that I recommend; to go in and observe the class teacher doing your lesson." (BT 12)

Students were given the opportunity to observe lessons of other teachers but the benefits were not always immediately recognised by them. Some said that it would most probably be of benefit when they start full time teaching; given another context they would be able to pick up on certain observed things. "What you believe is that you have some good role models you can reflect on ... so that good practice creeps into my teaching at a later stage." (A 230)

Assessment and relationships

The overwhelming view of the students was that the assessment role of the subject mentor significantly affected the relationship between them. This was not to say that negative perspectives were built, but the role and function of each person in the relationship was modified and in need of interpretation and understanding. Evidence suggests the formality of the role was respected but that mentoring advice might be sought elsewhere, from other teachers. The notion of the teacher as critical friend was affected by the summative judgment to be made.

> "I suppose I was always cautious that by becoming a friend or excessively friendly with my subject mentor that he would think I was trying to get a good grade on my assessment. And I suppose you can't argue, everyone must have that cross their mind so it put a barrier, a distance between us... because you felt that if you got too friendly with him or her that they felt you were being friendly because of what you wanted at the end of the day."(H 481)

In any assessment situation the students expected a mentor to give a fair and balanced judgment whilst continuing to praise and encourage their efforts. This type of relationship was said to "build a lot of strength between my mentor and me. There were good opportunities for reflection and getting to know my mentor better" (H 447) but the fear of final judgment did seem to weigh heavily on the mentor, identified both as friend and assessor, and this points to the conflict Stones (1984) sees in combining the roles.

> "I don't know whether they've accepted my advice because they know I was the one that was going to put the final signature on it or whether they genuinely accepted that I was somebody that they valued the opinion but that is a difficult thing. I think you should ask the student that...I hope there wasn't any friction anyway but I could see there could be problems when the final assessment comes about." (S 15)

Students mostly point to the value of formative assessment and judgment and value this highly in the interim audit stage. Despite reservations by many analysts, students found competence check lists helpful in establishing expectations but perhaps more importantly, they provided a focus for discussion in a less formal context and acted as a prompt for questions about uncertainty.

The subject mentors seemed to concur with research findings that students often wished to deal with elements of competence, especially in the early stages of learning to teach. A focus on particular aspects of competence at different stages in practices might point to a less neatly packaged and predictable listing of all that must be achieved but breaking down the teaching task into observable elements was important and allowed a student to concentrate on each at certain times.

Conclusions

The conclusions drawn from the research project are presented fully and under headings that most adequately describe the major areas of concern and comment.

The main findings

- collaborative and teacher team approaches contribute positively to the training, education and development of competence in the student teacher of design and technology.
- voluntary relationships play a major part in helping a student reach competence.
- a significant shift occurs from the formality of initially defined roles of the subject mentor to that of the preferred model of voluntary mentorship and training. Both the subject mentor and the student are catalysts in this redefinition, which is conditioned by the school and the context in which the training takes place.

Democratic mentorship

Democratic mentorship has emerged as a principal concept and is promoted vigorously by the subject mentors. The technology teaching team is central to this concept.

- *Team approaches* to mentoring the student in the subject and its application to teaching are represented throughout the research and are strongly desired by the mentor and the student. Those students who were interviewed were able to recall events extended over a period of time, in which a mentoring relationship developed with a 'design and technology' teacher who was seen as the expert in an aspect of the subject.
- *Team approaches* in giving feedback, evaluating and assessment have been promoted by subject mentors and are fostered and justified as a way of making judgments in an equitable manner.
- There is evidence to suggest that team approaches are seen to remove the burden of summative assessment from the mentor. This might be considered as an attempt, by the subject mentors, to redress the assessor/critical friend balance in the relationship.
- Student opinion and the mentors' actions suggest that the assessment role affects relationships to a large extent.

Assessment

Summative assessment was generally regarded as a formal procedure. The subject mentor who was chosen for his or her humanistic skills and qualities, according to the first stage survey, remained ultimately responsible for decisions about competence.

- This judgmental role was recognised by the students as affecting their relationship with their mentor.
- The subject mentor was seen to play a formal judgmental role at two stages in the school practice, the interim audit and the summative assessment.
- A formality in the mentoring role was expected by the students at these times who also expected the mentor to be professional, unbiased and fair in judgment at each stage.

The competence and assessment form was welcomed by most as an instrument of guidance, valued at the earlier stage of an experience for its specification of competence criteria and in developing understanding between the mentor and mentee. It provided a focus and helped establish expectations.

Formative evaluation and continual feedback were seen to be less formal activities and particularly valuable in the students' eyes. They were often recognised as coming from any one teacher in the technology team because of the lesson a student was involved in teaching at the time.

Generic and subject specific skills and application to teaching

There was a high expectation of student generic and subject specific teaching competence prior to the commencement of the practice.

- Mentors believed that students should have good regard for and capability in classroom control and management.
- Skill and ability in designing and in material manipulation seemed to be regarded as a core expectation.
- Mentors expected students to work across a range of design and technology fields, a fact demonstrated more in terms of the description by the students of what they actually did rather than by the demands described by the mentors.
- Mentors stated the need for students to be flexible and willing to enter new areas of the subject and be able to teach in them.

Two powerful conditions persuaded a significant number of students to shift their allegiance to a voluntary mentor, i) the requirement for a student to be flexible and willing to move onto new areas of learning and teaching ii) the formal assessment role of the mentor and its effect on relationships.

The voluntary mentor

It is significant that the role of supporting the student in developing subject knowledge and skills as well as practical teaching skills, was best fulfilled, according to the students, by a teacher other than the mentor but one who was still seen as part of the technology team.

- This informally chosen voluntary mentor was seen to be a willing, interested and involved teacher who was able to give time to the student whilst passing on their skills, knowledge and abilities but, most importantly, did this outside any judgmental framework.
- Support, advice and encouragement were high on the student agenda in order that they felt confident to tackle the teaching task.
- The opportunity to work collaboratively and in partnership with an experienced professional were highly valued.
- The dominant features of the voluntary relationships described by the mentors and students were:
  - that a joint contribution in the planning, organisation and delivery of a lesson or series of lessons was made
  - the building of a rapport, confidence and self esteem between the two, acknowledging the strength of the other person and sharing expertise
  - being able to be honest about difficulties in teaching and working together to solve them.

Stages in reaching confidence and competence

Formal staging in learning the subject and how to teach it were evident and described by a number of students as part of the process of gaining confidence. Observing and working alongside the teacher seemed to play a significant part in helping the student at a time of uncertain knowledge in the subject. Joint planning seemed to raise the confidence of the student significantly.

Stages in developing confidence and competence derived from student statements:

1) gaining instruction on the subject outside the classroom at the beginning and throughout the taught project
2) developing, together, a scheme and plan for teaching; rehearsing crucial skills; doing them repeatedly until mastery, ensuring an ability to demonstrate confidently in front of pupils
3) observing the voluntary mentor/subject mentor teaching the lesson or scheme and getting to know the children through the process
4) running the scheme together; evaluating the results and refining the approach
5) teaching the scheme as an individual.

Strategies for developing subject and subject application competence

Specific models emerged that were claimed by students to benefit them in developing their teaching ability:

a) being a learner in the same classroom as the pupils but contributing in some way to the topic or area being taught

b) being in charge of a class but being able to consult the teacher when it was necessary. Having immediate access to the expert was most important especially in areas of subject weakness.

c) In areas of strength, being able to 'get on with it' without interference but receiving feedback immediately after a lesson.

d) sharing the teaching task; working alongside a professional.

Recommendations

As a result of these findings the following recommendations are made:

- That the initial appointment of the mentor should be viewed as a supervisory appointment, one that includes the role of formal assessment.
- The voluntary selection of an informal mentor or mentors from a technology team should be recognised as a natural process central in benefiting the progress of a student toward competence.
- It should lead to a natural handing over of all the roles of mentorship from the supervisory mentor to the voluntary mentor, outside of those to do with judgment and summative assessment. In so doing, a clear specification and distinction is made between the roles of the supervisory mentor and the voluntary mentor.
- The supervisory mentor should judge the quality of the voluntary relationship and monitor the effectiveness of these relationship in providing coverage of the needs of the student.
- The provision of subject training should be monitored by the subject mentor in order to establish that it matches the student need and that it is being received. This might arise naturally out of voluntary relationships, but if not, must be catered for formally.

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