Student independence and teaching design

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Abstract

The work of the GRASP Project at the King Alfred's College has been concerned for five years with the relationship between designing, learning and teaching.

This investigation has led to an increasing interest in teaching approaches which promote student independence in the context of design education and design training.

The Department of Design and Technology in which the GRASP Project is located has over this period been faced with dramatic rises in staff-student ratios.

This paper reveals the way in which a strong conceptual underpinning in design education combined with a well thought-through commitment to the GRASP model for achieving results has supported progress despite a worsening educational climate.

It also reveals how this work has contributed to team building, around a shared sense of purpose. As such it should be valuable for others engaged in the forming of teaching teams in design and technology.

As is increasingly common in education, the members of the D&T department and the context in which they work are subject to continuous change. This account logs a process of change focusing on one central issue within this department. The period we have been concerned with runs from January 1991 to April 1992, to be brought up to date on presentation at IDATER 92.

The Position from January 1991

1 Additional staff and two replacements had meant that of the nine of us, five were in their first year. We needed to rebuild our team. We needed to share approaches between each other to achieve maximum coherence, especially as we now include three staff from industrial backgrounds with no previous teaching experience.

2 Our BA course was in its second year of operation and was requiring continuous work to consolidate its position.

3 Increased recruitment of students presented another pressure.

We have always been very active in examining our work closely to continuously improve it and our GRASP project has helped considerably. GRASP (Getting Results and Solving Problems) is a transferable approach to problem solving which works through a repeating cycle of questioning and which focuses especially on the effective achievement of results.[1]

When devising our BA Design and Technology course we had constructed an underpinning rationale based on an identification of the inter-relationships between three key processes: designing, learning and teaching.[2,3]

Attention to Independence

Starting the year with a review of departmental objectives our attention came to focus on the question of achieving greater independence in students. This was seen as a major criterion of success in designing as in learning, and fundamental to the purposes of higher education, not least in the context of teacher education. Our students are future teachers, future designers, lifelong learners. In all of these positions they need independence and the capacity to achieve, and to go on learning under their own direction and motivation.

One context in which there exists an inherent demand for independence (of either an individual or a group) is that of designing. Even with the most 'constrained' project there must be a significant element of independence in the process. It holds demands for students to have their own ideas, to identify their own purposes, to come to their own resolution of these and to have ownership of the process through which they proceed. It is axiomatic therefore that the teaching styles adopted in courses such as ours build an 'independence factor' consistently, and that this is supported through acquisition of a theoretical basis which can be related clearly to different contexts. We must then teach for an 'independence capability', and it is a contention of this paper that an effective way to do this is through use of the GRASP model.

Strategies to Build Independence

It was recognised that the goal of student independence was not something to be imposed on students by tutors but that it was an aim that must be shared. This was tackled by frequent informal reasoning from tutors, and through a formal paper put to the BA course committee (see Appendix A).

Over fifteen months a series of department planning and review meetings was held. A number of new approaches to teaching and learning were tried by staff and were reported on.

These meetings kept the topic alive, having student independence as a main issue but located in differing specific contexts. For example: the rising staff: student ratios in the College (becoming a critical concern); the need for mutual support in teaching methods so that one tutor's approach was not unwittingly undermined by another's; the values in the GRASP model; the need for broadening approaches in response to the National Curriculum concept of Design and Technology.

The issue was further examined in a joint staff/ student review of the various approaches which had been trialled, including the three examples given below and others such as the preparation of students for industrial placements (see Baxendale and Hook IDATER 92), and support for INSET dissertation writing.

A common framework linked the new approaches that had been trialled, representing a basic presentation of the GRASP process. This was represented by a set of key questions:

What am I trying to achieve?
What am I *actually* trying to achieve?
How will I know when I've succeeded?
What alternative ways are there to achieve this?
Which is the best?
How should I control the process of getting there?

What is my purpose - is this still valid?
Why this objective? . . Why do it this way?
This may alternatively be represented thus:

identify purpose
re-state the problem
establish criteria
consider strategies
select strategy
control the process
continually review

Many readers will recognise strong similarities between these lists and models of designing processes.

Three examples

Designing

Design and Technology Project Work

The third year of our BA (Hons) Design and Technology course has an element which involves students working in groups on a technological design project thereby giving them an opportunity to develop their personal skills in a group context. In Spring 1992, this element had only been run once before, but conscious changes to previous approaches were instigated with the explicit intention of developing greater student independence.

We would normally discuss objectives at the beginning of any course element but on this occasion this practice was augmented significantly by a conscious, and recorded, exploration of the inter-play of expectations of students and tutors. Their complexity soon became apparent.

Tutor expectations of each group
Tutor expectations of individual students

Student expectations of their group
Student expectations of fellow group members
Student expectations of themselves
Student expectations of the tutors

As may be predicted, student expectations were initially focused on the achievements of their own group.

The approach adopted here was to require the individual student to fully contribute to the corporate undertaking but in parallel to identify a personal agenda of learning needs. In this case the complex and potentially conflicting positions of 'I and we', 'achievement and learning' were explored through the setting of GRASP questions:

What am I trying to achieve?
What are we trying to achieve?
and
What am I trying to learn?
What are we trying to learn?

At the outset students identified the range of responses demanded by the project, mapped these against the expertise already in their group and established a working atmosphere where differences in personal qualities could be brought to complement one another.

Each student then constructed a list of personal objectives - areas that they, in consultation with tutors, identified as in need of further development. Their own learning goals were framed, and performance, both as individuals and as part of the group, could then be tracked against these.

GRASP, through its questioning structure can be seen to have offered a common language for the dialogue between the staff and students involved. It provided a mechanism for checking between each other the progress of events such that all may fully participate in and help steer the group process. As the GRASP framework was explicit and shared it provided a means of making more objective discussion of this progress of events, going some way to relieve personal tensions between group members.

Teaching

Preparation For Teaching Practice

The preparation and support of students for their role in schools on teaching practice comes from a variety of different sources: Education studies courses including Teaching Methods; the College teaching practice supervisor; the school's Head of Department and senior managers. A student group about to embark on their first teaching practice had these sources complemented by a one day preparation exercise based on GRASP principles, with its emphasis on the raising of consciousness of an issue through cyclical questioning.

On teaching practice students work in an environment that requires greater independence. They are remote from college and supported by teachers who are enmeshed in their everyday concerns, and college tutors whose time allocation is not commensurate with the nature and logistics of the supervision. GRASP gives support for this independence especially if the host environment has limitations and tutor support is further eroded through increasing staff: student ratios.

GRASP underpins this move toward independence by prompting a recognition of your current situation before leading on to a description of your desired result, and then the formulation of strategies for their achievement.

The first concern was to make more explicit to students their own previous learning experiences. There is the simple data of where and when their formal education took place - a biography to inform the school and possibly the supervisor, but they were spurred to go below this narrative and examine their own experiences of education at the deeper level of "What did I learn?" "Why did I learn?" "How did I learn?"

From this review of their own experiences of learning, placed against the broadest background question, "What is teaching?" (including an exploration of various models), they considered what *they themselves* wished to achieve whilst in their host school.

For most students the first teaching practice comes replete with anxieties. This group was encouraged to explore openly their reservations concerning the practice; which were, not unexpectedly, centered on how they would meet the expectations of others. These expectations still existed but augmented with expectations set by themselves. How were they to address them? They formulated strategies to meet their intentions and in taking control of these, gained confidence and the capability to become better managers of the intentions of others. Further contact with the host school will often require a reformulation of strategy, a phase of the cyclical questioning which GRASP recognises and actively encourages.

A student on any teaching practice, but especially the first, will be operating very much under the requirements of others - a culture of unavoidable dependency. Coupled with this, there will be a wide variation in the quality of the situations experienced. Use of the GRASP framework in this context helps students carry forward a set of personal intentions - their own independent culture- as a structure for partnership with others. Once established early in their course, this approach provides a model for their future working with professionals in whatever context.

Learning

A Particular Technology

In the early period of our courses projects are often more closely proscribed to ensure the building of a wide range of competencies. One minor project undertaken by the first year BA group has an introduction to electronics as one of its learning objectives. There is a wide diversity within the group of prior experience in this field (from A level electronics and/or industrial experience to none). The group was formed into learning pairs - one with more experience of electronics and a partner with less experience. Whilst this demarcation was made on the basis of electronics knowledge, the project also contains four other objectives:

1 to investigate how needs and opportunities can be identified;

2 to consider the requirements of the envelope to

the electronics and construct/modify existing envelope to meet these requirements;

3 to be involved in a learning relationship with one other;

4 to consider the implications of implementing this or similar projects in school.

The paired learning relationship was utilised as a form of 'peer tutoring'. This phrase is not used simply to denote the support of one student by another in a field of specialist knowledge such as electronics. As students' work together progressed, so the full tutoring function was released. Each partner, in drawing information and clarification from the other, assisted that other's learning, and in so doing, started to experience how another learns.

In order to make the dialogue more conscious, both during and after the event, there was a requirement for it to be recorded. The range of student comments was wide but with a strong consensus on worth; from simply helping :

'having a partner meant that the project was less daunting from the start, you weren't on your todd'

to concern with deeper issues

'avoiding being teacher/pupil but working as a team, and yet making individual progress'.

At one level, peer tutoring prompted a decrease in dependency on one potential holder of information - in this case the tutor, but also the use of the GRASP framework helped students agree their purposes more effectively and offered a structure for the way they proceeded together.

The results of this approach were firstly, better learning in electronics as students progressed at their own pace and many had direct access to support. Secondly, they had an introduction to a new partnership approach to learning as a model for future activities. Thirdly, they experienced GRASP being effective in another, different context.

Conclusions

It can be seen from the above that we have been exposing students to the GRASP model in a wide variety of course contexts, and that we have found that it can offer them valuable support in all of these. To transfer learnt skills across contexts must be valuable. Transferability is frequently a problem in education - we so often fail to utilise what has been learnt in one part of our education when operating in a different context.

It is a basic position of the GRASP project that transfer will not automatically occur to an adequate extent[4] - teaching strategies must address this aim explicitly. The way in which we make most explicit how the transfer of competencies is being acquired is through repeated use of the GRASP model.

The value in students meeting and putting into practice repeatedly an underlying support model may be indicated in three ways. Firstly the model is useful in its own right - it makes them more effective. Secondly, the applicability of the model to differing contexts is made clear, thereby identifying the common features of 'goal-directed activities'. These contexts can hold such forms of difference as group/individual, theoretical/practical, design projects/teaching, individually determined/tutor-set projects. Thirdly, an important factor in our courses, is that students are assisted in becoming better designers, better technologists, better teachers, and above all, better learners.

The constant presence of key questions within their various activities is the crucial enabling agent which has proved effective whether they are engaged on something practical or theoretical.

It is important to note also that this approach draws student attention to the common features in the process of 'making things happen' which recur in what they may otherwise see as very disparate contexts, with very disparate demands. Through this means they can be helped to develop better objective understanding of achievement processes of which designing is their most relevant. It is logical to assume therefore that they are, through this means, helped to become better designers. In our tutorial support to these students in the later parts of their course this assumption is seen to hold good. Without prompting, many use the model explicitly to underpin their approach, to design and technology activity but also to such as the writing of essays and placement reports.

Another notable change has been in the quality of support a student receives on out-of-college course components such as teaching practice, industrial placements, and design projects for external clients. As well as inclusion in explicit preparation activities, the GRASP framework goes with them as a result of the internalisation attained through using it repeatedly in college. This makes them more effective in these activities which necessarily demand more independence.

If this greater independence is achieved then we can be confident that we are meeting our aims for our students for when they leave our courses.

References

1 Chambers, J E and Perry, D *Getting Results* KAC/ Comino Centre 1990
2 *BA (Hons) Design and Technology with Certificates (*Course Document) King Alfred's College 1989
3 Elmer, R *GRASP and the BA (Hons) Design and Technology/Certificates Course, King Alfred's College, Winchester* KAC/Comino Centre 1990
4 Chambers J *The Journey not the Arrival* KAC/ Comino Centre 1990

Appendix A

Paper for the BA/Certs Design and Technology Course Committee

Self-motivation and independent learning

Education is about meeting students' learning needs - personal development needs and needs relevant to their course demands.

Design is about meeting needs - through artefacts, systems or environmental change

In providing design activity in general education we are using it as a vehicle for learning which is very flexible. Students as designers should be involved in using designing for their own learning purposes.

In other words student designing is a combination of the two things set out in the first two paragraphs above.

To manage this well, student and teacher need to share an understanding so that the one may help the other achieve their purpose - be this in the immediate context of fulfilling the demands of the design exercise or in the longer term context of the educational purposes behind it.

I see this notion as central to the aims of this course and underpinning all that students do on ESE. Following discussion in the committee I should like to ask that course groups use this idea as a topic for discussion in student fora.
My concern is that we should by this means conduct an open debate to establish common understandings. This should:

influence tutors in how they may set project briefs and how these may be open to negotiation by students

make students aware of the significant part they can play in guiding their own learning

through the above, make the course genuinely flexible in its response to individual patterns of need (strengths/ weaknesses brought to the course)

guide students in their behaviour as teachers to promote similarly flexible learning in schools

In discussions reference should be made to the GRASP approach in the work of the KAC/Comino Centre and the booklet 'Getting Results'.

Appendix B

Design and Technology, Department Meeting 13 December 1991
Discussion Prompt: Moving forward with student independence.

Aims:

To achieve greater willingness by students to take responsibility for their own learning and greater independence for them in the process.

For the department's ITE work to support NC approaches more (without compromising other priorities).

Consider the relationship between

'student-centred learning'
the concept of 'Exploring a context to identify a need or opportunity'
in national curriculum D&T
and the need for us to expand our work across the four other NC D&T federation areas: IT/BS/HE/A&D.

If this creates a model for our practice (at least in free project supervision)

might this reflect rather than mimic NC D&T?
is the model appropriate to higher education?
is the model appropriate to the BA Industrial Pathway?
is the model appropriate to all our courses?
where are the limits to freedom?

If so:

what immediate changes should we make to current practices?
what resources will we need?
what staff development?