Using multi-discipline assignments to enhance the development of transferable personal skills in initial teacher training

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Using multi-discipline assignments to enhance the development of transferable skills in initial teacher training

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Abstract
This paper aims to present a description, analysis and evaluation of the use of cross-subject small-group projects in teacher education. There are a number of inter-related issues which need to be considered when encouraging students from different degree programmes to contribute to joint-project work. These issues include: co-operative learning, learning in groups, problem-based learning and experiential learning.

The shortened degree programmes in Business, Education and Technology Education at the University of Sunderland have for three years developed and offered a joint module of study where students from both programmes have been put into situations where they can work together to analyse and appraise the perceived ‘design and make’ needs which emanate from an identified topic or theme. The students work in mixed subject groups. This paper aims to review the background to group learning, and raises the problems and dilemmas, the triumphs and perceptions, the questions and some of the answers raised by such activities in teacher education programmes. There is also an intention to consider in detail the learning outcomes (perceived and actual) which result from such work, and the benefits and opportunities such work presents to students in higher education who are developing and using transferable study and work skills.

Background
National Curriculum Technology remains a relatively new subject in the school curriculum and, despite recent changes in the orders, we believe that the principles of collaborative work established by the 1989 document, remain valid.

Technological activity is creative. It has definite purpose, is carried out within a range of constraints, and requires participants to make evaluative judgements at each stage of the process. Students are required to resolve issues relating to human needs through analysis, problem-solving and evaluation. Often the resolution of identified issues happens as a result of co-operative endeavour, and involves multidisciplinary activities which draw upon a wide range of skills and knowledge.

In doing so the students will develop attitudes and values, and also develop the capacity to make judgements based upon reasonable consideration of the evidence produced as a result of the activity.

The teaching of National Curriculum Technology is certainly helped where staff are able to work closely together without structural barriers. Close physical proximity is an ideal often very difficult to realise in schools but in any case it is essential that everyone involved in the planning and delivery of Technology gives of their expertise. Children need to be taught by teachers who are confident in their knowledge and as teacher educators it became clear to us that we needed to provide opportunities for our students in Business Education and Technology Education courses to experience the planning and delivery of Technology as the ‘multidisciplinary activity’ referred to earlier. Back in 1990 the teaching teams from four programmes (2 and 4 Year Business Education, and 2 and 4 Year Technology Education) met to try to iron out many of the areas of uncertainty that existed between us. Neither programme area was fully aware of the work going on in the other, and we all carried with us pre-determined notions about the other area’s subject content and teaching and
learning priorities. It appeared, initially, that the meeting of the staff for the two courses would be fraught with difficulties.

Naturally we had to tackle our existing preconceptions. Each of the four programme leaders spoke to the rest of the group about course structure and content. This was followed, of necessity, by an open forum for discussion where a number of questions and ideas were raised:

1. Did the partner programmes need to have a common structure with any integrative modules developed?
2. Should all the programmes be re-written together when the time comes?
3. What can we do now?

We determined that we could begin, in the 2 Year Programmes, to develop an integrative module immediately which developed subject knowledge and skills within a co-operative endeavour. The involvement of the 4 Year students was more problematical, because the programmes were designed, from the outset, with different needs in mind, but opportunities for the inclusion of a new joint module when the requirement for re-writing arose were proposed and accepted in principle.

The shortened degree programmes in Business Education and Design Technology have developed and offered a joint module of study where students from both programmes have been put into situations where they work together to analyse and appraise the ‘design and make’ needs of identified organisations.

This experience has been invaluable to us in preparing for the representation of our programmes for inclusion within the University’s Modular Credit Scheme. This representation has enabled the same module to be offered to all undergraduate secondary programmes in Business Education and Design Technology Education for the first time.

What the students are required to do

The students involved are required to work in multi-disciplinary teams to resolve an identified or negotiated problem. We believe, and there is a consistent message from the DfE to support our view, that National Curriculum Technology should not diminish the role of the specialist teacher. We identified, therefore, specific requirements for each group of students specific to their subject area:

Business Education students are required to pay attention to issues of project management, reporting, marketing, finance and economics;

Design Technology Education students are responsible for the ‘design and make’ management of the project;

All students are responsible for the evaluation of the project against the requirements of National Curriculum Technology.

What these requirements do not do is to force students into situations where they are working at a disadvantage to themselves. Both Business Education and Technology Education are wide subject areas in their own right. Our students have differing experiences and expertise. We encourage them not to forget this and to negotiate approaches to the resolution of the problems set for them against the context of our requirements, and of the collective strengths of the individual group members.

This year’s project required the students to work within the context of ‘The Urban Environment’ and to develop an artifact, system or environment pertaining to that context. Our only ‘constraint’ was that the students demonstrate the relationship of their ‘group project’ to the context.

The group experience

This approach to working was considered by the module-team to be apposite to the professional development of the students: in terms of their subject knowledge, their awareness of subject application and in maintaining responsible working relationships, in social skills and in their ability to support and enhance the groups’ performance.

The integration of Technology Education and Business Education students into small groups
with open-ended tasks which have clear and structured assessment criteria and performance indicators encouraged the students to use all the skills within the group, and to recognise that each member of the group must be expected to look beyond their subject disciplines.

The structure of the group is important in maintaining a coherent approach to the problem solving activities, and the students in identifying their collective strengths and weaknesses had to look always at their ability to reach solutions.

The allocation of students to working groups was not carried out according to skill-based criteria or by geographical area. The module begins in Semester One, when staff and students are all new to each other. The selection of group members is simply based on the student’s given name (alphabetically) and an appropriate balance of members by subject discipline. There is no underlying theory or rationale for the external determination of group dynamics. We do not have time to analyse student types according to Belbin’s theories of management groupings. We recognise that the ‘perfect group’ is an impossibility, and exhort our students to consider the nature of the profession they are entering - and the requirement for teaching professionals to be flexible and pro-active.

Teachers are not just teachers of their subjects: they often have to work in multi-disciplinary teams and to perform tasks and duties outwith their normal sphere of activity. Button (1982) highlights this issue in terms of the form-teacher, but the requirement relates well to the experience of the teacher working in a cross-curricular team:

... but the skills and approaches required may not be part of their normal experience. The insecurity of many teachers, when faced by this role, has been one of the chief obstacles to the effectiveness of the work... (p 1)

Through this module of study, students need to be prepared to accept approaches that are new to them. They need to commit themselves to a method of working that not only allows them to express themselves but, also enables them to guide, support and extend their peers as the project progresses.

Our experience of the practice underlines the importance of the preparation, training and support that is required in order to adopt a more sophisticated approach to the teacher’s rôle in a collaborative group. There is always a danger that the students will attempt to bring in a ‘ready made’ working method from a previous experience, often with no attempt to communicate this to the rest of the group. There is a sequence and continuity to the structure of the module, and within the nature of the student assignment, which facilitates the steady growth of communication within the groups, to enhance the multi-disciplinary dimension of the work and so to develop truly multi-dimensional teams.

The development and maintenance of ‘relationships’ within groups is supported within an arena wherein the knowledge, skills and understanding can be learnt and practised. Multi-discipline assignment work is a way of offering vital experiences with other people who are learning to help one another on the basis of empathy rather than conflict or competition. Our ambition has been to aid students in their building of personal resources so that they can cope effectively with their professional life as a teacher and tutor and the reality of working within a school which requires more than just subject teaching from them.

Multi-discipline assessment work provides a different experience from usual professional development assignments in Initial Teacher Education in that most of the responsibility an individual has is towards fellow students rather than towards tutors or deadlines. There will always be a need for periodic ‘milestone’ assessment along the way, but the student/tutor relationship forms only a small part of the educative experience. For example, peer-relationships, especially those developed during the cut and thrust of task-division, require a range of skills and attributes to be ‘learnt’ and applied. Students have to ‘learn’ about each other as individuals and as members of a team - they also have to learn
something about themselves in these situations.

Schön (1987) believes that peer relationships are at the heart of professional training, and we have found that students who are at odds with their peers seem to be in difficulty in many other aspects of their work (Downey and Kelly 1979, p40). Certain students have developed poor relationships with their peers within this module of study and this has evidenced itself in poor attainment grades in other modules and poor performance on teaching practice. This has encouraged us to review student progress on a regular basis during, and after, the module and to establish counselling and guidance procedures. There is a possibility that without the provision of modules like this that modular degrees may postpone the development of professional co-operation and collaboration skills by offering a pathway based on individual work alone.

A supportive group of peers seems to be a more effective arena for the type of exploratory work in which we are requiring the students to engage. The supportive group can operate as a platform from which students learn to contact and develop work with external organisations outside the sphere of ‘normal’ curriculum work, and we have maintained the use of external sources of information and the use of professional organisations for market research and feedback as a central theme to the multi-discipline assignment work tasks. The development of group work skills in this module of study has also been seen to build confidence in collaborative work in other modules too, and it has been a source for the networking skills in the ‘professional year’ when students may find themselves trying to cope with an isolating and lonely experience if they fail to communicate fully with the staff of their placement school, or with other students studying alongside them.

Professional development of this type cannot be realistically expected to stem from a succession of tasks designed primarily for some other purpose. Time must be devoted to collaborative education across subject disciplines (Reid 1986 p66) and this is best attempted, we feel, by multi-discipline assignment work. Each student must be encouraged to venture according to their own strengths. The tutor has the task of trying to be aware of the differing needs of each of the group members, and the module leader must take on the rôle of supporting the tutors and acting as a team leader.

Sufficient time is vital to the work. We undertook to set aside three hours per week for ‘student team meetings’ and to communicate with the tutors, but required the students to account for a further three hours per week to complete the tasks identified by the ‘team’. So much depends on the professional development of students in Initial Teacher Education that adequate time needs to be devoted to this type of work. The beneficial effect on other areas of study can be so great that a high priority for multi-discipline assignment work can be claimed. A student teacher who is motivated by self-interest alone, and who is unwilling to see another person’s point of view, can be a problem in school departments, and a student with low self-esteem can impede his/her own professional development. Peer pressure, group controls and group and individual responsibility can encourage conscientious effort, study skills and the ability to support others in their work.

We do not claim this type of work with students is a panacea for all student difficulties, nor to all difficult students. We have found that some students respond very badly to working in groups and that one difficult student within a group can disrupt the whole to such an extent that the work produced is of a low quality. In these situations we find that the students are having to learn and re-learn their inter-personal skills to such an extent that they are unable to progress effectively with the task in hand.

What the students thought

While the work was in progress the students were reminded at all times that whole group or individual (within the group) problems had to be resolved within the group. Only when a problem could not be resolved by the group was it to be brought to the tutor for arbitration and mediation. Under such circumstances we
listened to the issues from all sides, asked questions about the procedures already taken by the group, and offered further advice and/or made an 'executive decision' on their behalf. This caused difficulties for some students, especially those who were used to 'backing out' from responsibilities, or who preferred to work alone. There were many gripes: and some students vowed they would never work in groups again - and especially not in a group that contained students from another discipline. On the other hand it must be stated that the majority of the students found the module to be 'potentially valuable'.

Much of the 'banter' was good humoured, and when the time came for formal feedback about their experiences the majority of the respondents felt that they had learned something about themselves, about the nature of the 'other subject', about working as a member of a team, about alternative measures of quality, and about the 'learning environment'.

Formal feedback is given through a 'module feedback' questionnaire (Appendix 1). This is completed by students at the end of each module studied: every module collects its own feedback and evaluates it. They are required to relate the questions posed about their experience to the statements made by the module team within the module guide given to the students at the beginning of the semester. A small proportion of teaching time is given to the distribution, completion and collection of the questionnaires towards the end of the semester. Students complete the questionnaires anonymously.

Four of the items of feedback highlight issues that we, as a module team, need to be aware of. They relate to students' perceptions of the teaching and learning strategies employed in the module, and demonstrates that some students find this approach more difficult when in other modules they are following more traditional patterns of teaching and learning. This, in many respects, fulfils our expectations, and we were not surprised nor unduly worried by the high proportion of students expressing some measure of dissatisfaction.

It looks here that a significant proportion of the students (never less than twenty percent) found the drive towards self-directed and group-managed learning difficult to cope with. They appear to want more teacher involvement and direction from the front rather than the facilitative approach that we had adopted.

In Table 2 we can see that although we have evidence that some students were in doubt about the efficacy of the teaching and learning strategies, there were no surprises about the actual content of the module since our 'management of the project' conformed exactly to what we described in the module guide. Students agreed that the assessment was appropriate, and that the module encouraged individual and group learning - which, after all, was the aim of the exercise.

### Plans for the future

The module has run in something of this current form for a number of years. It has changed slightly each time in the light of staff and student satisfaction.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Broadly agree</th>
<th>Broadly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The aims and objectives of the module were achieved</td>
<td>94%</td>
<td>69%</td>
</tr>
<tr>
<td>The assessment was appropriate</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>The content matched the module guide description</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>The teaching sessions encouraged individual and group learning</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 2
We have moved from very open tasks within a ‘theme’ to open tasks within structured contexts.

The modular structure has in itself caused problems. One of the major features of the assessment process has been a presentation, and this has taken place so far after the nominal deadline for marks to enter the administrative procedures. The module leader was responsible, therefore, for negotiating a module specific deadline so that the presentation could remain a viable part of the assessment process. This in turn increased pressure on staff to assess and submit marks very quickly. Another problem which occurred this year was that during the weeks normally set aside for assessment and examination, students from the BA/BSc Technology Education programme were required to study for their ‘workshop safety certificate’. The responsibility for the presentations, where Technology student could not negotiate ‘free time’, devolved to the Business Education students.

In the light of these experiences and reflections, cognisant of the needs to display the high quality work produced by the students and to inform the external contacts made by the groups, the presentations will take the form of a ‘conference’ / open day - planned and organised by a convened student council. We are taking the principles of responsibility and professional collaboration one stage further - and trusting that the students will rise to the challenge.

What is the value of this work?

What is interesting here to us is the clear relationship between the skills developed through Technology Education, the requirements of the labour market and the needs and experiences of the young people our students are destined to teach. The interaction between economic and social realities and the life encounters of young people within Technology Education has an important rôle to play in their education for an active contribution to society. McConnell (1982) made a range of claims about the value of placing technological learning within societal contexts:

Public decision making by citizens in a democracy requires an attitude of attentiveness: skills of gaining and using relevant knowledge; values of which one is aware and to which one is committed; and the ability to turn attitudes, skills and values into action. All these steps can be encouraged if a decision making perspective is incorporated into the educational process. (p13)

The learning activities developed within Technology Education support the attitude and value shifts McConnell describes. But what do we hope that students would learn about and accept as valuable from their experiences in multi-discipline group work?

Part of the answer lies in the integration of cross-curricular dimensions, skills and themes within technological activities: giving the students an opportunity to see how their subject inter-relates with other subjects; giving them an opportunity to see that, in real life, activities/tasks/learning do not take place singly - there is interaction in all things.

The tasks undertaken by the students - regardless of their specifics - demonstrate a commonality of requirement:

- application of personal driving qualities such as determination, resourcefulness, enterprise;
- personal innovative powers of imagination, intuition and invention;
- powers of observation and perception;
- willingness to make decisions based on both logic and intuition;
- sensitivity to the needs being served to the possible consequences, benign or harmful, of alternative solutions, to the values being pursued. (Naughton, 1994, p15)

Given the responses of students through the formal feedback mechanisms, the project has enabled them to develop a profile of generic skills and competencies. Also, the development of an understanding of the application of Technology within a mixed subject group has had, we would argue, a tangible effect upon the students who became involved.

For our own students we perceive that aside from the development of the specific subject skills described within the aims, objectives and requirements of the module of study, there is a range of generic attributes which can be applied directly to other learners.
### Whole Student Development

<table>
<thead>
<tr>
<th>Understanding and Using National Curriculum Guidelines</th>
<th>Independent Learning</th>
<th>Greater awareness of self</th>
<th>The difficulties of working with and for someone else</th>
<th>Rôle in the wider community</th>
</tr>
</thead>
</table>

### Conclusion

This paper describes our previous work with students and our intentions for the future development of the joint module of study. We believe that our plans and provision for student learning will enhance and enable the development of their understanding of and capability in the application of Technology. For our students this development will take place on at least two levels: they will be able to apply their learning within the framework of their experiences, and at their own academic level, using their experience to develop and inform their learning; and their experience of learning and working in this way should actively inform their own planning and preparation for teaching in secondary schools.

### References

Questionnaire with responses

**University of Sunderland School of Education**

**Module Feedback Questionnaire**

**SESSION: ..................................**  
**SEMESTER: ..................................

**MODULE CODE & TITLE: ..................................**

**EDT 2.10**

As part of the quality assurance procedure, and in order to improve the quality of the student learning experience, we seek feedback from students on their experience of the modular programmes. It would help us to achieve the aim of continuous improvement if you would take the time to complete this questionnaire.

Please mark the response which most closely matches your opinion about each statement.

SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree

**With reference to the Module Guide: (given at start of Semester)**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Responses marked [ ] please</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The aims and objectives of the module were achieved</td>
<td>[ 5][ 26][ 2][ 0]</td>
</tr>
<tr>
<td>2. The teaching and learning strategies were effective</td>
<td>[ 3][ 23][ 7][ 0]</td>
</tr>
<tr>
<td>3. The assessment was appropriate</td>
<td>[ 5][ 27][ 0][ 0]</td>
</tr>
<tr>
<td>4. The content matched the module guide description</td>
<td>[ 6][ 27][ 0][ 0]</td>
</tr>
</tbody>
</table>

**With reference to the delivery of the module:**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Responses marked [ ] please</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. The module content was well delivered</td>
<td>[ 4][ 17][ 9][ 0]</td>
</tr>
<tr>
<td>6. The teaching sessions:</td>
<td></td>
</tr>
<tr>
<td>a) were at the right pace</td>
<td>[ 4][ 25][ 3][ 0]</td>
</tr>
<tr>
<td>b) were well structured</td>
<td>[ 3][ 18][ 9][ 0]</td>
</tr>
<tr>
<td>c) encouraged individual and group learning</td>
<td>[ 13][ 16][ 0][ 0]</td>
</tr>
<tr>
<td>7. Information / handouts were:</td>
<td>[ 1][ 20][ 5][ 0]</td>
</tr>
<tr>
<td>a) relevant</td>
<td>[ 1][ 14][ 10][ 0]</td>
</tr>
<tr>
<td>b) sufficient</td>
<td></td>
</tr>
<tr>
<td>8. The module has been (potentially) valuable to me</td>
<td>[ 4][ 22][ 3][ 1]</td>
</tr>
</tbody>
</table>

**With reference to the module, the two most positive experiences have been:**

a) ........................................................................................................................................

b) ........................................................................................................................................

**You may like to indicate ways in which the module could be improved:**

a) ........................................................................................................................................

b) ........................................................................................................................................

Thank you for your help in completing the form. Analysed responses will be presented to module studies boards.
EDT210 - Semester 1

Summary of Student Feedback

Positive experiences

Team/Group Work 17
Working with students from another programme 11
Development of time-management skills 4
Understanding design problems 1
Experience in working with plastics 1
Research experience 4
Chris's teaching style/positive attitude 3
Development of product 6
Using the computer 1
Developing awareness of other subject 2
Developing communication techniques 1

Improvements

Excess volume of work for a 10 credit module 2
Having 3 group leaders can encourage three marking schemes: individuals look for different things? 1
Move to Semester 2 to consolidate work done in Semester 1 1
Dragged on a bit 3
Business Students don't make anything 2
Matching of group members better to cover required skills 4
Matching of timetables 7
Why? 1
Conversion of skills 2
More formal teaching sessions perhaps 1

The students appeared to have enjoyed the assignment work, and especially the use of team and group work as well as working with students from another programme. Gratifying to see some students comment positively on my own approach to the learning activities!

Major improvement, though many aren't even offered, would be to try to match the timetables a little more closely and to carry out a skills audit prior to allocating the students to groups.
Appendix 3
The Assignment Brief

Assignment:
With direct reference to the urban environment the group is to identify an area of human need that they could alleviate with an artefact, system or environment of their own design. The design will need to be realised up to a prototype or model stage and used in the final presentation.

The assignment will be in three main parts. The separate units which go to make up Part A will contribute to the total group mark. The focus of responsibility in some of the units will be individual - in others the focus will be on the group - all marks contribute to the total.

Part A
At levels 2 and 3 students are required to undertake a design and make a project for an external organisation, to document and manage the project effectively, to operate within a ‘cost-effective’ environment, to be aware of the market for their ‘product’, and to be aware of the quality issues and the ethical issues involved.

Part B
At Level 2 individuals are required to review the project measured against the National Curriculum Technology Documents of 1990 and 1992.

At Level 3 the individual review of the project should also include a discussion of the viability of using external organisations for student activity within Technology.

Part C
Each group is to present their work orally and visually to the tutorial team.

Directions for students
The success or failure of this module depends upon the ability of the students to work to deadlines and to identify quickly the opportunities that exist for design and make related projects with external organisations. Group work involves many skills and attitudes that often go unrealised. Group work can cause frictions. It is the responsibility of the students as a whole group to identify group work problems, to attempt to resolve them within the group and should the issues remain unresolved to bring them to the attention of the group tutor and to document the issues fully.

Individuals who are not deemed to have contributed effectively to the group project will have their mark for Parts A and C reduced by a percentage agreed by the group in consultation with the group tutor.

Assessment:
Part A accounts for 60% of the total marks. Part B accounts for 30% of the total marks. Part C accounts for 10% of the total marks.

Assessment Criteria:

Part A
Description of project (including objectives) 05%
Project management chart 05%
Minutes of meetings 05%
Copies of all correspondence 02%
Results of tutorial sessions 03%
Design brief 05%
Design portfolio 10%
Rationale for ‘final product’ 10%
Quality of finished product 25%
Costings 10%
Market Analysis 10%
Project Evaluation 10%
[60%]

Part B
Summary of project 10%
Description of project to NCT (including IT) 20%
Analysis of NCT targets applicable to project 50%
Identification of how project could be developed to extend NCT target [30%]
Part C
Communication skills 10%
Structure of content 15%
Structure of presentation of rationale 20%
Evidence of information collection 05%
Organisation of resource 15%
Management of individual contributions 15%
Presentation of poster 20%

Hand in Dates:

Part A
*12.10.94 - 12.00*
- Project Description/ Objectives Project
- Management Chart
- Initial Design Brief
- Initiated by the Group/
  External Organisation
- Initial Design Portfolio

16.11.94 - 12.00
- Minutes of weekly team meetings/copies of correspondence
- Market Analysis
- Detailed plans/designs for 'agreed product'
- Rationale for 'ideas rejected and accepted'

16.12.94 - 12.00
- Final Product
- All documentation as a portfolio
- Project evaluation

Part B
23.01.95 - 12.00

Part C
Visual and Oral Presentations to take place during weeks commencing 16.01.95 and 23.01.95