Group Task Management: A key element in Technology across the curriculum?

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It is becoming apparant that the new 'technology' which will evolve to fit the national core curriculum will be different in both content and execution to many of the syllabi carrying the title 'technology' under GCSE. To some extent this is pragmatic, we simply do not have enough teachers to cope with courses similar to current ones. It is also, however, now recognised that this form of technology is not necessarily appropriate.[1] It could be said that current 'technology' syllabi are, in reality, largely engineering science courses which have adopted a much more general title.

If we look at technological endeavour in industry two aspects are prevalent:

There is no specific and finite body of knowledge. People enter an opportunity or problem with an open mind and it is as a part of the process that understanding in various areas becomes necessary. Nobody can know the total knowledge that may be called upon, indeed the process may lead to innovative research, but because nobody has the sum of knowledge we see the other aspect. People work in groups. they cooperate in the task and are usually competing against other groups/companies. They recognise that the skill is in knowing how to access knowledge as and when necessary. Group work can also lead to the synergistic generation of ideas, it is better than individual work.

It is possible then, to look at technology in a new light. Technology is about groups of people managing a task. We could add — within a commercial environment. The knowledge base they operate in is the sum of human knowledge, but it should be used at an appropriate level and with an understanding of the complex relationships of man, his environment and his technology.

Hicks represents many views with his observation that technology can be at a level of awareness, understanding and capability.[2] Technology is, therefore, a very broad concept. It is in every subject on the curriculum and clearly to some extent this is how some of the national curriculum allocation will be managed. Most people would agree that children should be aware of the technology in history, geography etc, however, this is

clearly not enough. In addition we will maintain a subject or range of subjects on the curriculum titled 'technology' in order to maximise the understanding and capability Hicks mentions. Hopefully these new 'technologies' will continue the progress made by many GCSE syllabi in recognising the human element in technology, such as the LEAG CDT: Technology with aim B 'To stimulate the exercising of value judgements about technological artefacts or systems, in terms of aesthetic, technical, economic and moral considerations'.[3] But even this is not enough, we need a third, integrating, element to technology which could be fulfilled by the concept developed at Loughborough and known as Group Task Management (GTM).

GTM has evolved over the last 3 years. An early statement can be found in the SDECT winter 1986 edition.[4] This work has now developed to the point where a considerable body of experience has been built with children and teachers.

GTM is not a concrete, prescribed, activity, however it will assist the reader if a simplified example of the type of activity undertaken was described.

The basic concept is that of individuals operating in COOPERATION within a group and yet COMPETING against other groups, just as in the real world. This is done within a simulated commercial environment which can be as simple or complex as the teacher wishes it to be. For example, one aspect may be to raise a business loan as a part of the task, teachers could simulate a bank manager but it is also possible to use a real one.

Central to the concept is the fact that there is a task to be done. Tasks managed within research case work to date have included desk tidies, teenage beach wear, food for motorway coaches etc. Necessary inputs' of knowledge can be given by staff, or outside experts when appropriate.

The groups can be assessed in terms of commercial success. This is done by putting on a 'trade exhibition' at the end of the activity. The groups go round and act as buyers and place orders. In addition, during the working, period staff can observe and record the complex and yet subtle interaction within the group.

GTM can be used within a conventional timetable but it is undoubtedly most powerful when operated in the 'saturation timetabling' mode.[5] This means that the timetable is suspended and pupils work exclusively at the GTM task. The period can vary from one afternoon to one week or more.

We can see that GTM offers an experience where children act as they will in industry — they work cooperatively in teams and compete against others. The knowledge base they apply is undefined as in industry and they must find out what they need to know. We have, therefore, linked to two other probable elements of technology in the national curriculum — those of technology within curricula areas and any specialist 'Technologies'. As a tripartite approach it has great value. Summary of factors in GTM activities.

— Groupwork skills and attitudes developed.
— Task and time management skills.
— Competition introduced within a controlled and supportive environment.
— Integration of curricula areas.
— The development of true responsibility to colleagues within groups.
— Working to and achieving deadlines.
— Research skills.
— Design and manufacture skills.
— Optimisation as a concept and skill development.
— Familiarisation with basic commercial practice.
— Communication skills:
    ongoing liaison within group
    listening to inputs and briefing other group members
    writing and physically presenting a case to outside agencies such as Banks
    using basic Information Technology e.g. —
    using word processors and computers
    communicating with clients, verbally, graphically and by the written word.

Suggested structural factors for running GTM activities
Flexibility
The key factor in planning GTM activities is FLEXIBILITY. These notes

are not 'tablets of stone' but a suggested framework about which teachers can exercise freedom to introduce topics of their own choice. This can be done within a structure which meets the limitations of their own particular work place. Gaining experience and confidence are important and these can be gained easily. Start simply and then develop in an incremental manner.

time allocation options
A teacher can operate a GTM in a normal timetable slot for any period. If the timetable is suspended, or a group of teachers operate together using 'pooled' time virtually any period is possible. It should be noted that experience has shown that longer periods of dedicated time are far more efficient, allowing the build up of high levels of pupil identification with the task. The theory of attention span simply does not apply, there is a constant source of internal change to satisfy pupils' need for stimulation.

team teaching
Team teaching is not absolutely necessary, but it does offer greater flexibility and potential. This could be within a faculty or better still across several, so incorporating expertise from other curricula areas — a true cross curricula experience.

topic
Topic is, of course, important, and yet it is the learning experience pupils go through which is more so. No display of the final product can ever convey the detail and breadth of the experience for an individual child.
The topic will vary with time available but a number of points are worth making:
a. It should ideally be a genuine commercial opportunity. E.g. 'fast food' for motorway coaches[6] or teenage beach fashions. Teachers should experiment.
b. The topic need not have a specific, concrete, product. For example the groups may compete for solutions to greater efficiency in the evacuation of airliners in a fire. A product, however, offers a clear and concrete objective, a useful point when working with mixed ability groups.

c. The topic should have opportunities for liaison with outside agencies such as banks, businesses, hospitals etc. Pupils should have to go and talk to these agencies as a part of the activity though it is possible to simulate the agencies or bring them into the school, depending on the time and resources available.

progression
Children need to experience these activities developing over their whole secondary education. This could be done in several ways — perhaps starting with simple exercises over short time periods in the foundation years, building up to complex activities where the timetable is suspended for, perhaps a week and a whole year group simulates a commercial environment.

Whilst an individual teacher can experiment with GTM, it is important to eventually see GTM in a whole school policy. It is not an alternative or substitute curriculum, nor does it belong to any one curriculum area. It can, however, provide a very powerful learning environment in support of technological activity across the curriculum.

group structure
Left to their own choice pupils will always go for peer groups. This is, however, not a good medium for GTM. Better to allocate groups which are of mixed sex, ability and of pupils who either do not know each other (from different classes) or do not normally mix. Such an allocation of 'socially engineered' groups by staff will be met by howls of dismay, but if it is explained that it is only for a short period of time and that it is being done to develop their ability to meet new colleagues and work effectively as they will have to do when they leave school, pupils usually accept it and get on with the job.

Girls should be at least in pairs within a group. Placed on their own with, say, three boys they tend to be overwhelmed.

The group size can be varied but a good starting point is 4. Three is a suitable number for younger pupils but 4 ensures that the level of internal communication necessary is optimised.

preparation
Preparation and general planning should be done in such a manner that the activity virtually runs itself. E.g. a time plan is published giving the external deadlines. All other resource material or contact phone numbers etc are available at a central point with a

notice board and the groups made to understand that they do not ask the teacher but attempt to find out information themselves. It is important that groups learn to manage their own activity and do not immediately turn to staff for help. The teacher can then be free to teach and act as an 'adaptive interventionist'.[7]

briefing/debriefing
Staff should hold regular briefing and debriefing sessions with pupils. These notify and remind groups of the next stage in the activity. They are also used by staff to 'paint' a mental picture of the activity as a simulation of real world business, to help them live the simulation.

The debriefings are an opportunity to discuss things staff and students have observed in the last stage. Examples may include how well certain groups are gelling together, what techniques are being used to make decisions etc. It has been found helpful if staff carry a clip board in order to make notes as the activity progresses.

warming up
Groups will be much more effective if a short time is spent 'warming up'. This simply means getting to know each other. If the group normally work in the same class this is less of a problem, but in more advanced GTM activities children will be working with people who are initially complete strangers — just as they will in industry or commerce.

There are many ways of warming up, here are two, please experiment.
a. Simply get the group to agree on a company name, give them 5 minutes to 'register' their company. Suitable when children are from the same school.
b. Co-counselling. First get the children in pairs. Each child has three minutes to find out about their partner. After this stage the pairs get together in four's and each person has two minutes to brief the others on what they now know about their partner. If done properly this activity is very efficient at breaking the ice and promoting good working relationships.

timeplanning
Deadlines will be set by staff, for example when certain inputs are to be given and when a final display should be ready for assessment. It is important,

however, that groups learn to identify and set their own internal deadlines in order to ensure the project is on schedule.

Pupils are used to working in a closely structured setting where subjects change each period and staff set clear and close deadlines. Within GTM staff should set the task and final deadlines, the groups must learn how to handle that time themselves.

inputs
Inputs serve a dual function. Firstly they act as a source of information, for example how to cost out certain materials or how to ask a bank manager for a loan. A second function is to help groups manage their time by putting in certain 'fixed points' during the activity. The inputs should all be planned and prepared for certain specific times which are published on the activity noticeboard which the groups refer to.

The groups are told that only one member of each group can attend any one input. This means that groups have to work out who will attend which input and at what times. This provides the beginnings of a framework of internal deadlines. The fact that only one member can attend places great responsibility on that individual to attend, to make careful note of the information and to communicate it effectively back to the members of the group.

Inputs should bring in as many outside experts as possible. Some may be located outside, in the local bank, for example. This would necessitate pupils using the telephone (input on telephone technique) and, if possible finding their way to the appropriate location. By doing this we increase the perceived relevance of the activity for pupils and also offer them opportunities to develop responsibility. Experience has shown that they rise to it.

Feedback — Evaluation and Assessment
Feedback is very necessary for both the teacher and pupil. The teacher in order to assess the activity and improve it, the pupil for personal development.

Assessing the performance of the individual within a group is a difficult task. This is primarily the reason why so little group work is done in the final years at school, and yet we know that

group work skills are so much more important at that time of life, just before starting in the world of work.

GTM does not have a magical answer for obtaining a reliable and 'objective' assessment of individual performance in group work, particularly in terms of a 'grade', however there are techniques which can offer valuable feedback and can be linked to profiling techniques which are rapidly gaining acceptance:

observation
Notes can be made as interesting events are observed. Experience sharpens up the teacher's perceptions, especially if he or she alternately tries to stand back from the activity, and then zooms into the workings of one group or individual. Pupils very quickly get used to this form of observation and ignore the fact that staff are making notes.

Staff should be looking for a wide range of aspects such as: are there dominant personalities within the groups; are some individuals too shy to join in to any extent; are tasks delegated; do the group meet to review progress; do the group intelligently replan when obstacles occur; do individuals support each other; do they use positive language and offer praise; the list is endless.

The more observers the better, in this way we triangulate the observation and improve reliability considerably. Team teaching, bringing colleagues, senior staff, people from commerce and industry, parents and governors are suitable techniques. If GTM runs correctly the teacher will be amazed by the amount of the time available for observation, so many of the usual irritating bits of routine class management vanish.

outside agencies
Feedback can come from outside agencies that have operated within the activity. Pupils give high weighting to such feedback as it is from 'professionals'.

self assessment
An important technique to employ is feedback from the pupils themselves. This can take two main forms, commercial simulation results and questionnaire/discussion techniques.

'market feedback'
As GTM centres around a commercial

simulation it is possible at the end, or during the activity to assess the product or service. An example would be to put on a 'trade display' and tell the groups to appoint a salesperson who is to remain by the display, the remainder are to become buyers for companies interested in the product or service. If staff simulate a finite sum of capital available to each buyer and the buyers are not allowed to buy their own product we can gain a very useful picture as to how the pupils rate various the groups performance. Experience has shown that they can be remarkably mature about this. Subsequently sales figures of number sold, at what price and total profit can be made available and be the focus for many meaningful discussion.

group discussion
Another technique is to hold group discussions. Again experience shows that pupils are remarkably mature when offered opportunities such as this and are often far more sharply analytical of their own performance than staff.

If we add the various techniques of gaining feedback together we gain a remarkably comprehensive picture which both staff and pupils can share. It may lack the 'objectivity' of public examination but it clearly makes up for this with it's depth, breadth and value.

Summary
GTM has now been under development for three years and it is very clear that the activity is able to generate levels of commitment and enthusiasm far beyond that which can normally be found in a traditional curriculum and timetable structure. Children report the activity as being relevant and of benefit. There needs to be further work on achieving an effective and externally valid assessment model which could operate within the resources of school, nevertheless the concept of GTM is a valid one.

The new core curriculum and TVEI 2 are important catalysts in developing our approach to technology in the future. We must recognise both the advantages and the limitations within the two approaches currently projected:
a. technology within individual subjects
b. technology(s) as a 'subject' within core