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**National Academy for Gifted and Talented Youth
(NAGTY)**

**Summer Schools 2005
Seven Case Study Strands**

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INTRODUCTION

The NAGTY summer schools, 2005

The National Academy for Gifted and Talented Youth (NAGTY) offered summer schools for its members at a number of universities during the summer of 2005. The universities involved were those of Warwick, Durham, Bristol, Lancaster, York, Leeds, Imperial College London, and Christ Church Canterbury. Of these, Leeds and Bristol universities were involved in the NAGTY Summer School programme for the first time in 2005. The Centre for Educational Development, Appraisal and Research (CEDAR), the University of Warwick, carried out evaluations of the summer schools (Cullen, Hartas & Lindsay, 2005).

The seven case study stands

The focus of this report is on seven individual courses (known as 'strands'). For the 2005 summer schools, NAGTY asked CEDAR to focus on seven strands that NAGTY viewed as *examples of high quality teaching on the summer school programme*. The stands were chosen *by NAGTY* on the basis of two criteria:

- 'that they represented good practice in pedagogy in the judgement of those running the summer school and drawing upon inspection reports also;
- that, together, they reflected a range of subjects/academic disciplines that would generate a range of subject-related pedagogy.' (quote from NAGTY)

The selection did not imply that these were the only, or the best, examples of high quality teaching - they were intended as case study exemplars only.

The exemplar strands identified by NAGTY were:

University of Durham:

- Anthropology
- Philosophy

Imperial College, London:

- Robotics, autonomous control

University of Warwick:

- Creative writing
- Drama
- Law

University of York:

- Physics

The information provided in this report is based on:

- one observed teaching session for each of the strands in question, used as a shared experience that formed a basis for subsequent recorded interviews;
- an interview with each strand leader;
- an interview with the qualified teacher (or the equivalent) on each strand;
- a small group interview with a stratified, random selection of students on each strand.

The purpose of this work with the strand leaders, teachers, and students was to provide accounts of high quality teaching and learning experiences that could be used to inform others involved in the delivery of NAGTY summer school strands.

The report

The core of the case study report is composed of separate accounts and analysis of the seven exemplar strands. In each case, an outline of the strand observation is followed by an account of the key elements in the planning, operation, and the teaching and learning experience of the strand, as identified by NAGTY:

- the planning process for the strand;
- how the academic, the qualified teacher, and the teaching assistant worked together as a team;

- aspects of the teaching and learning that took place on the strand.

These accounts are informed by the qualitative data drawn from the interviews with strand leaders, teachers, and students. The final section of each case study draws together points made by interviewees which may be applicable to others teaching on NAGTY summer schools and, where appropriate, to teachers in schools. (It is, however, recognised that the NAGTY summer schools represent very different teaching and learning situations to those pertaining in schools.)

Following the examination of the seven case studies, overall conclusions are presented which highlight common themes between the strands, and, where appropriate, particular aspects of teaching and learning that are specific to individual strands.

1. IMPERIAL COLLEGE, LONDON. ROBOTICS - AUTONOMOUS CONTROL.

1.1 Setting the scene

The CEDAR fieldworker was invited to attend a morning session, between break and lunchtime, of the autonomous control robotics strand. The session was on the second Thursday of the two week summer school, and the students were making final preparations for their participation in the 'Mission to Mars' competition that was the strand focus throughout the summer school. The autonomous control robotics strand was working separately, but in parallel, with the remote control robotics strand, who were also focused on the 'Mission to Mars'. This mission would involve the students' robots exploring a simulated Martian landscape, and recovering 'rock' samples from its surface.

The session took place in a very large assembly hall, 'The Great Hall', which was laid out in preparation for the competition. In the centre of the hall, a geodesic dome acted as the command centre from which the students would control their robots in the competition. The Martian landscape itself was hidden from view behind a large screen. The landscape was made up of a series of ramps and platforms, becoming progressively more difficult for vehicles to navigate the further into the terrain one went. Scattered across this terrain were 'rocks', each carrying a number. At the opposite end of the hall were tables, overseen by an adult technician, which carried spare parts, robot kits, and equipment, that the students could draw upon. The students themselves (all boys in the autonomous control strand) were engaged in refining their robots in preparation for the competition which was to be held the next day. The boys worked in groups of around four per team. The strand leader was available for help and advice, and the qualified teacher was observing the teams, and taking notes to help build the students' post-course reports. In addition, the post-graduate assistant was present, using a laptop computer to develop the final details of the competition.

The CEDAR fieldworker noted that there was a very clear sense that the students were totally engaged by their task. She said, 'I was struck by the absolute, purposeful, calm, atmosphere' of the students. She was also struck by how well resourced the strand was, by the availability of high cost equipment, and the number of adults present. The students were relaxed, but excited and motivated by the forthcoming competition, and

their tasks. They spoke freely, and with confidence, to the fieldworker about what they were doing. They were trying to iron out problems that they had discovered with their robots. They were engaged in hands-on problem-solving, and they were learning by trying things out, making mistakes, and trying new approaches. They were aware that they were engaged in an exciting learning process.

1.2 Planning the strand

The summer school held at Imperial College, London, is atypical in that the school is run by an independent educational body, Exscitec, on behalf of the college. Exscitec is involved in providing short science and technology courses for a range of young people, and has long-standing links with Imperial College. In terms of the NAGTY summer schools, the involvement of Exscitec means that, to a large degree, the robotics strand was a pre-prepared course that was adapted to the needs of the NAGTY students:

"I mean, it's quite a portable structure, really. [...] The structure stays the same from summer school to summer school, so that it's so well tested by us, and we just find that it works".

The strand leader, while not being an academic, had extensive experience, with Exscitec, of robotics education, and was Exscitec's co-ordinator of their engineering robotics outreach programme. His fulltime role was, therefore, to run robotics engineering courses for young people. His approach to planning the NAGTY summer school was built upon a two week structure, using Exscitec's extensive robotics resources, and drawing upon the gifted and talented expertise of another Exscitec employee.

The strand leader felt that the central planning issue was how to structure the two week course. The nature of robotics meant that there were inbuilt constraints on the way in which the final product could be constructed, but this limitation was also an opportunity, in that it would enable flexibility to be built into the course:

"I was involved in the [Robotics: Engineering strand], as well as the [Robotics: Autonomous control strand] for the planning. It's tricky, because we've got a

specific way of learning robotics, you know, it's not like, 'which experiment shall we run?' It's, you know, we've got the kit and we've got the materials, the resources, so, it's all about how we structure the two weeks. Because [...] the first week was very much, I wanted it to be the team building, finding out what the students were like, finding out what they liked, how they worked".

As all the work by the students was to be undertaken in small teams, two days at the start were spent on team building, where the students from both robotics strands (Engineering and Autonomous control) built the geodesic dome in the assembly hall, and built and used pneumatic rockets. These exercises were essential to the success of the teaching and learning experience. The strand leader also built into his plan a series of possible developments for the first week, seeking to anticipate the directions in which the students might like to develop their activities. His advice for people in his position was:

"Prepare for the different age ranges. Have a number of back up plans, have a number of different approaches ready. I think it's really important to get to know the kids before making the final decisions. I know you can't do that in some areas, but, we're fortunate we can do it in robotics".

and

"I am aware of those [possible] situations and, therefore, I would be prepared with links, documentation, books, and whatever resources I need".

This enabled him to have a high degree of student input into the direction of learning. Further, although the summer school offered two, apparently discrete, robotics courses, focusing on the engineering and programming aspects of robotics, the strand leader, and the strand leader on the second robotics course, planned for students to be able to shift from one strand to another, as their interests took them. This was possible because the two strands were working in the same, very large, space, and had co-operated in building the 'control room' - the geodesic dome. The strand leader explained the rationale for this:

"We were leading separate strands, and we found that a lot of the students would like to learn the other area of robotics, which is very much split into two - engineering, you know, putting the stuff together, putting the wiring on, making the nuts and bolts robot, and then controlling it. So, you know, to give a student a well-rounded idea of what robotics is they should really, I think, see both sides of the coin. And to build something that works, of course, they're going to be inquisitive about how they control what they've just built, or how they build what they are able to control. So, you know, this is why a lot of them have asked whether they can go to the other side. And I think that's worked very well".

The physical resources available to the strand leader were key elements in enabling a flexible and thorough course to be offered. He was able to draw upon an extensive range of physical components, and computer hard and software:

"It's the materials. Because I've worked with Exscitec for three years now, we've spent that sort of time building up our resources. We started with robots, I've been to a few conferences in America, educators conferences, and we've come across various kits, so, yes, the resources, they're not bought for the NAGTY course. [...] Gears kits, and then we've got the first robot which is, as I say, it was [used at] a big international competition that ran in March this year, so we're using that. And, they've got radio controls, they've got, you know, the autonomous control with the laptops. It is only something you can run if you've got a lot of resources".

In addition, the strand needed a teaching space that would enable all these elements - team working, mixing between the two strands, construction activity, and the competition itself - to be combined. This was provided by the Great Hall at Imperial College.

1.3 Working as a teaching team

The teaching team was made up of a number of adults, each with course-related skills and knowledge, and teaching training or experience. The usual summer school model of strand leader, qualified teacher, and teaching assistants was applied, although with modifications, for example, the non-academic status of the strand leader.

The interviews with the strand leader and qualified teacher, taken in conjunction with the observations made by the CEDAR fieldworker, indicate that the different members of the teaching team were clear as to their differing roles. The strand leader explained his view of his role in comparison to that of the qualified teacher, a view that was, in turn, confirmed by the teacher in her interview. The strand leader noted:

"I like handing over the responsibility, some of the responsibility to the teachers [he included teachers from both strands], and me not having to think about things like, I mean, it hasn't happened on this course, but, sometimes, you have misbehaviour, and, you know, the academics shouldn't be there to fire-fight, and control that sort of thing. But it's not just there, because you've got teachers in support, and [...] they do help in terms of their knowledge of maths and physics".

This picture of the roles of teachers and strand leaders was confirmed by the qualified teacher, who commented:

"The teacher's role, I probably think, is just overlooking what they [the students] are actually doing, picking up kids that are probably not doing too much, monitoring their log books, making sure things are recorded, it's more so just really looking over them. And if they do have any questions, to help answer them, more so now in the project work, to make sure things are organised, encourage them to organise themselves, whereas the academic leaders tend to take care of the course material, we just make sure when it is delivered that everyone is kind of paying attention, and they do know what they are doing. Also, just picking out kids that maybe floating, not sure what they're doing, how to get them engaged and all that".

These aspects of the team's provision were enhanced by the use of graduate mentors with specific knowledge and skills in the area of robotics. The physical environment of the Great Hall, the resources available, and the team-based learning of the students ensured that the various teaching team members were able to fulfil their roles effectively. They all had an active part to play in facilitating the robot planning, building, programming, and testing tasks faced by the students. By the second week of the

course, the students were essentially in charge of their own learning, which was something that the qualified teacher commented upon:

"Your role [as a teacher] is just to overlook everything, to just make sure the kids are engaged, they're working, there's learning going on. It's not very high pressured, because we're dealing with the gifted and talented kids, they get on with it themselves".

The success of the teaching team was not however, simply a product of their awareness of the different roles, or the fact that they were dealing with a specific group of highly motivated children. A further, essential, ingredient was the good working relationship that existed between all the people in the teaching team. When he was asked how the team had negotiated their differing roles, the strand leader replied that "we've kind of all grouped together, I mean me and [the other strand leader] lead, and everybody else just mucks in". He felt that the reason why this worked was that the team knew each other from previous courses. The result was that a co-operative and friendly atmosphere prevailed:

"They've worked on other summer schools this year, in other places, so we've got plenty of time to sit down and talk about it. And I make sure they're comfortable with their roles, and vice versa, and they know their roles, and I know my roles, so, we just get on with it, really, it's just quite a friendly atmosphere, which is always quite nice for the students to pick up on as well".

1.4 Teaching and learning

The Robotics: Autonomous control strand was characterised by a teaching team in which each member was clear about their role, had a good working relationship, a flexible, but planned, programme, and a desire to allow the students' learning to take centre stage. Of great interest was the fact that the students' descriptions and analysis of what made teaching and learning successful on the summer school, matched closely to the strand leader and teacher's own view. The students identified four key areas that they felt made the learning experience valuable, and which reflected on good teaching practice. These areas were:

- the atmosphere (ethos) created in the strand;
- the tasks that they were given to do, and the way those tasks were assigned;
- freedom of choice for them as students;
- the peer group they were working with.

Ethos

The student interviewees all contrasted their usual experience of formal education unfavourably with their experience of the summer school. Essentially, they felt that the treatment they received at the summer school at the hands of the teaching team was superior to that they received at the hands of their school teachers. Some of their criticism was quite damning. By contrast, they felt that the summer school atmosphere was highly conducive to learning:

"They [summer school teaching team] just talk to you, [but] at school they just shout at you, basically. And they just talk to you [here] like a normal human being".

"Here if you get stuck or anything, they're always willing to help you out, they don't just shout at you for not knowing".

"And they're not strict [at the summer school], like saying, 'Don't talk!', and 'Silence!', and everything".

The students felt that, as a result of these differences between the summer school and school, the atmosphere was much better, something that the strand leader noted too:

"In terms of how I've created that environment - I don't know, it just naturally happens. It's just, I think it's just created because everyone working in that environment is very linked together, very friendly atmosphere, so it's a very easy going atmosphere, but, obviously, with rules, with specific workshop rules [health and safety rules], and, obviously, you know, being able to provide all of those resources".

The students would also agree that it was about '*everyone working in that environment [being] very linked together*', but the strand leader was minimizing his own role in creating the friendly, learning-conducive environment.

Freedom to make learning choices

The students felt that, in addition to being treated '*like normal human beings*', one of the other factors that created a good learning environment was the freedom they had to find their own groups to work with, and to choose, especially in the second week, how they were going to progress. The strand leader, in his interview, noted that allowing them freedom in this way was an integral part of his approach:

"It's kind of trying to allow everyone to do what they want. And because we've got the sort of resources we can let them.[...]And they chose themselves [their teams]".

This was favourably commented upon by the students:

"I like the way they just let you get into your own teams, so that you can get to know people, rather than just saying, 'You go with them'".

Peer group

In '*getting to know people*', the students felt that one more factor had been added to the good learning environment - the nature of the peer group that they were with:

"It's essentially a lot more hard work than at school, but, I think the only reason, you know, it's not really like school because everyone who's come here actually wants to come here, and wanted, you know, to do the work, so it's a lot more efficient in that sense".

The strand leader made it very clear that he saw didactic teaching as only a small aspect of the course. It was necessary, especially in the first week, to explain key ideas and techniques. However, that was done with the clear intention of enabling allowing the students to create things - such as the geodesic dome, and the rockets. In the second week, the strand leader saw the essential experience as being overwhelmingly a

learning experience, with the staff being there to provide essential briefings, and to act as advisors, when called upon by the students. The strand leader made his approach quite clear:

"They just want to feed off the information, they're very much learning for themselves, and I'm not teaching them, which is great, perfect".

He used an example of qualified teachers saying that they did not feel that they were doing anything, in other words, that they were not teaching:

"It's great, yes, a really nice atmosphere, and I think that the teachers will agree, I mean, at times they've said to me, 'I just feel like I'm not doing anything'. Because they don't have to, and I'm sort of stood there, as well, thinking, well, you know, this is ideal, this is what it's all about, you know, they're just learning how to do things by themselves".

And this view was also taken by the students, one of whom commented:

"I think it's more involving here, because they let you work out things for yourself, instead of just, 'There's a worksheet, work your way through it'".

These contrasts in teaching and learning at school and at the summer school were also apparent to the qualified teacher, who noted:

"I mean, it's weird, I'm speaking to the other teachers, as well, just comparing this to the classroom situation, I think, because we follow the syllabus and we're just so kind of rigid, we just stick to a, like, a syllabus, and we try to get through it, but these kids, they say it themselves, they've been 'challenged' so much, whereas we want to get an A grade and stop, that's our maximum, these kids are thinking far beyond that. They're just very, very motivated".

1.5 Application

In this section, a number of points drawn from the case study of the Robotics: Autonomous control delivered at Imperial College through Exscitec that are of potential relevance to others, are summarised.

1.5.1 Potentially relevant to NAGTY teaching teams

Planning the strand

- recognise the importance of high quality resources
 - The extensive, and expensive, resources used for the two Robotics strands were provided by Exscitec and were such that they could be used repeatedly on other Exscitec courses and events. Although this was a unique situation, the strand leader believed that the importance of high quality resources was generalisable. His view was that the resources enabled the students “*to branch out*” in their interests and learning.
- plan the overall course *structure* to have purpose and rewards for the students
 - The Robotics: Autonomous control strand was planned so that it started with two days of exciting, engaging, purposeful team activities with concrete outcomes. The first week ended with a competition designed so that the week “*finished on a real high*”. The second week was focused on project work, culminating in the final strand competition and the summer school-wide presentation day.
- plan the course *content and delivery* to allow for flexibility
 - accept that planning for bright students requires even more preparation and planning than usual as they are likely to want to take the learning as far as they can
 - plan content that will enable learning at different paces and allow for some students to follow interests in-depth and others to range widely across a topic or area of study
 - allow time for students to establish key concepts and to log their own learning and reflections

- be willing to be flexible in responding to the needs, abilities and interests of the students
- write down the planning so that it can be built on in the future
 - remember to include lists of subject-specific vocabulary that was unfamiliar to some/all of the students

Working as a teaching team

- make the most of the teaching team
 - meet together before the summer school to plan and to ensure mutual confidence with respective roles
 - clarify areas of responsibility of each team member
 - build on teams that work well together by seeking to retain team members for future summer schools
 - enable qualified teachers to share their subject knowledge and to support individual students in learning at their own pace
 - enable post-graduate teaching assistants to act as role models to the students

Teaching and learning

- take time to get to know the students
 - During the Robotics: Autonomous control strand, the two days of team-building exercises were an opportunity to “*stand back and watch*” and to find out which students came forward as leaders, which hung back shyly, “*to ‘read’ them*”. Students were allowed to work in teams of their own choosing during the first week but knowledge built up by the teaching team during the first week was used to ensure balanced project teams were created for the second week.
- be open to learning from the students
- use an open-ended teaching style/delivery (enabled by planning, preparation, and working as a team)

- offer open-ended activities that allow the students to lead the direction of their own learning
- provide help and subject knowledge to support students' learning
- offer breadth and depth in the subject or topic area and allow students to choose which to focus on

1.5.2 Potentially relevant to teachers in schools

The qualified teacher interviewed thought that she would take back to her school the following points:

- the need to offer extension work to the very bright students;
- the need to reflect on the motivation showed by the students on the summer school in order to explore how very bright students at school could be similarly motivated.

2. UNIVERSITY OF DURHAM, PHILOSOPHY: ARGUMENT MATTERS

2.1 Introduction: setting the scene

The philosophy strand was based in a large seminar room, which comfortably accommodated the 16 students (eight boys and eight girls), the strand leader, the qualified teacher, and the teaching assistant. The walls of the room were covered in posters made by the students, dealing with key issues that they had discussed in the first week of the course, for example, school and creativity. The students, and the strand staff, were seated in a circle, with a flip chart to one side. The qualified teacher opened the session by talking to the students about the different ways they had been working, in small groups, and as a large group. The qualified teacher was trying to encourage all the students to participate when they felt that they wanted to contribute. To this end, she reminded them that they had a 'Joker' system that they could use. This was a large playing card, with a Joker image, that at any time during a whole group activity a student could pick up. This would then enable the Joker holder to question the direction of, for example, a discussion. It was noted, by the qualified teacher, that little use of the Joker had been made in the previous week, and she hoped that students would feel more comfortable at the beginning of the second week to intervene in this way.

The topic of the session was introduced, by the qualified teacher, as being anger, and the class began with the showing of an half hour video clip of a programme by Alain de Botton on Seneca and stoicism. The students were not required to take notes, only to watch the video. After the clip was finished, the students were asked to spend five minutes, by themselves, writing down 'anything you might think of' in connection with anger, or stoicism. They then continued the 'pyramiding' process by discussing their personal responses in small groups of three students, with one of the students noting down the key points of their discussion. The notes from each group were read out, then spread out on the floor in the middle of the circle. One boy started the whole group discussion by choosing a question he wanted to discuss - 'To what extent should we be pessimistic, because we can't all prepare for alien invasion every day'. This began an in-depth discussion, in which students contributed their own thoughts, and the conclusions of their small group discussions. The whole group came to focus on two questions - 'Can anger be a good thing?', and 'Does pessimism lead to a happier life?'. This, in turn, led

to a group focus on 'Can anger be a good thing?', which led to discussion about emotion and rationality. The qualified teacher intervened to use a piece of rope to create a Venn diagram on the floor to help illustrate the arguments that the students were having over the relationship between emotion and rationality. Two students intervened with the Joker card, questioning, at different points, the direction of the discussion, which they felt was moving away from considerations of anger. Finally, the students were each asked, in turn, to sum up what they had taken from the class. Students were not compelled to comment, and some did not. The session was completed by the qualified teacher who linked the students' discussion with a contrast between Aristotelian and Platonic views, which, she argued, had been mirrored in the students' own deliberations.

2.2 Planning the strand

The philosophy strand leader had run the philosophy strand for the Durham NAGTY summer school since its inception in 2003. He was a member of the academic staff in the philosophy department at Durham, but also had a background in teaching, and in teacher training. His approach to planning for the summer schools had been based upon a number of principles, which were apparent in the observed session, and which he believed, based on the experience of three NAGTY summer schools, were applicable to the NAGTY students.

The philosophy strand leader's general approach was to create a situation whereby the teaching team could respond to the developing interests of the students over the two week period of the summer school. This entails having a wide variety of material prepared, that can be drawn upon, when, and if, it is needed. Talking about his resource base, the strand leader noted that it had taken time to build it up, but:

"It's gradually built up, so there's lots of things on the computer which can be modified and brought out. And material that [the qualified teacher] is using in all sorts of contexts, as well, so, it's like I'm taking, teaching a new module, isn't it, to a certain degree? Then you have a range of things, so, we've only got, what, four days left this week, but, we've got at least, we could have several weeks' worth of possibilities without struggling or thinking about it".

Using an extensive resource base, built up over the three years that strand has been offered, the strand leader constructed the teaching around a few principles:

- students learning to take part in small groups and in the whole group;
- students sometimes having control of the direction of their exploration of various ethical and philosophical issues, while, at other times, the learning being strongly directed by the teaching team;
- ensuring each day was characterised by variety in all respects.

The strand leader did not think that there was a secret formula for teaching the students, but that the basic principles combined with staff reflection on the students' progress, backed by a willingness and capability to be flexible were important:

"It sounds unoriginal and unexciting, [but] I think a variety of formats. So, small group work, different sorts of small group, as well as the large group work. Some work where they have a substantial degree of control, but, at the same time, this morning, I think some of them said they didn't quite value the small group work when there was a member of staff there. So, all these different things need to go on [...] variety. And I think what part of it is to give them an experience of having quite a significant control, but, also, given that they're having those opportunities, that we need to have other, tighter, more focused, more structured activities where, maybe, we can put more, the philosophy of...I think they need both".

The principles of variety, self-directed learning, and structured teaching informed the planning for the course, and each day of the course was broken into a range of activities, topics, and experiences reflecting this approach. An example was the plan for the first Friday of the course, i.e. day five (Figure 1).

Figure 1 Plan for Day 5 (illustrating variety of group size, topic and teaching method)

Art and Beauty

9:00 Exploring philosophical theories of art.

In small groups draw on readings to present to the class the theory they have been allocated:

Significant form theory

Family resemblance theory

Institutional theory

Idealist/Expressionist theory

Anti-Intentionalist theory

11:00 Break

11.30 Violin performance: Bach 1st movement of 1st unaccompanied violin sonata. Including questions to the violinist about music, the violin, art and beauty.

11.50 Categorising items as to whether they are art/beauty/neither.

12:30 Lunch

1.45 Revolver: Is abortion right or wrong, is gay marriage right or wrong? Including 1 Spot Joe activity as a break between issues.

2:45 Introducing Question Time, roles and issues. Allocating roles and topics for role play to be acted out on Tuesday.

3:00 Break.

3:30 Researching for Question Time in computer room.

4:00 Close.

Each day of the course contained discrete activities, such as discussions and debates about specific issues, but also themes that were spread over the life of the course. Typically, key concepts, such as 'Status Anxiety', 'Ethics' and 'Art and Beauty' would be run over three days, intermingled with activities focusing on one-off issues, and longer investigations. For example, the students prepared a form of balloon debate, entitled Space Odyssey, over a number of days, before the debate was held. Similarly, the students spent time on different days preparing a 'trial', to be held at the end of the course.

2.3 Working as a teaching team

The strand leader and the qualified teacher both expressed the view, in their separate interviews, that one of the strengths of the philosophy strand was the close working relationship that had developed between them, and the teaching assistant, over the three years that the strand had been offered as part of the Durham NAGTY summer school. They felt, indeed, that they would have to reconsider their involvement in the strand if either of the other team members was no longer able to participate in future years. While the existence of the current team provides strong continuity, there would be issues associated with continuity if the teaching team was no longer able to be involved in the philosophy strand.

The strand leader explained that he had known the qualified teacher through his own involvement in teacher training, and that when it was clear that a philosophy strand was going to be offered for the first NAGTY summer school, in 2003, he had wanted to involve this teacher from the outset. The strand leader was particularly attracted to the teacher's wide background, both of philosophy in schools, but also of teaching on various philosophy outreach courses, both nationally and internationally. The third member of the teaching team, the teaching assistant, was, in fact, a qualified primary school teacher, who had taken a degree in Conflict Resolution at the University of Bradford. The strand leader had recruited this team member because of her specific interests, which arose from her degree background. Together, the strand leader believed the three made a good, complementary, teaching group:

"[We've] been doing it for three years, and I knew [teacher] through a network of colleagues who do philosophy education, and I know she's been [involved] in philosophy, philosophy in school on a national level, so when I was asked to do it, I thought of her. But, as I said before, it does make the team rather different than ... a philosophy teacher from a school, so I've got a national [and] international, expertise in doing these sorts of things with a whole range of ages. And, I suppose, intuitively, I also thought she was quite different from me, she is, so we have complementary strengths. The others worked successfully for three years. [Teaching assistant] initially, when she came on our team, she had just been to do her primary post grad year, and she was a very competent student, who'd done the degree in Conflicts Resolution at Bradford, and is really into dialogue and debate, and argument. And then she got her job as a teacher, and to my surprise and delight she went on wanting to come and do this, you know, on wages that actually students get [...] she's doing all year as a full time primary teacher, and then [this]".

All the teaching team believed that they were working in a situation that was characterised by a high degree of equality, and, reflected the strand leader's belief that they complemented one another, that each brought different skills and knowledge to the strand. The sense that they were a team, rather than a mini-hierarchy, was expressed by the strand leader:

"If there are any areas where we're not happy with each other, we'll tell each other, or if we disagree, we can say - nobody, nobody suffers in silence".

This view was also voiced by the teachers themselves. Further, the class observation seemed to indicate that the teacher and the 'teaching assistant' (also a qualified teacher) did, in fact, take the lead in terms of guiding the sessions. The strand leader commented on this, explaining that he was taking advantage of the teaching skills of the qualified teacher. In addition, he felt that the comparative youth of the 'teaching assistant' meant that she was able to interact with the students in a way that perhaps was not open to either himself or the qualified teacher:

"And [the qualified teacher] is, I think it's fair to say, she's always done the lion's share of teaching. I don't totally know, well, she's very good at doing it, but on the other hand, you know, again, we vary that quite a bit. And [the teaching assistant] has often got all the crucial role in it, and the different sorts of activities she does, and she's a sort of mediator, as well. So, you see her, certainly, as having authority but, she's more, not, she doesn't pretend to be one of them ... she never does that, but she's nearer them. And sometimes she can talk to them individually ... and get their feelings, or maybe they tell her things they might not tell me. But that's important".

2.4 Teaching and learning

From the inception of the philosophy strand at Durham in 2003, the strand leader based the teaching objectives, not on delivering a content-heavy course (such as a highly compressed 'history of western thought'), but on introducing philosophical methods and ways of thinking:

"I suppose we are, I'm sure you share this unease about the [mix in formal education] between the process and content, but, I suppose, I am more focusing, we're more focusing, on the process here, [rather] than content. There's no way we could pretend to get very far to debate about political philosophy [...] We take them as far as they can cope with, or we will let them take us as far as they can cope with, but it is much more to do with...about how to argue, how to work in a group, and [develop] dialogue, and that's the aim".

The teaching team's approach to teaching was therefore characterised by a focus on processes, delivered in a flexible way, with variety in terms of pedagogic technique and topic focus.

In their interview, the students identified three aspects of the philosophy strand that they felt contributed to their experience of learning - the atmosphere that was created in the classroom; the element of freedom of choice; and the characteristics of the student group. The students agreed that the teaching team were very friendly, and that the

atmosphere was relaxed and respectful in the classroom. They were pleased that they were treated like adults by the teaching staff:

"I think they [the staff] are very friendly, and they're very, I mean, if you unintentionally, like, interrupt someone, which happens to me sometimes [laughter], which I'm embarrassed about but, they don't really tell you off, or something, they really try to be calm and accept everything".

"They do treat us, like, much more adult and that kind of stuff".

The students repeatedly noted how learning on the course was much more satisfying than at school. This was a result of a number of features of the teaching. In particular, they felt that there was more discussion, both between the students and the staff, but, in particular, between the students. They were clear that they learnt from these peer-group discussions. Illustrative quotations were:

"There's a lot more discussion and sitting in a circle [on the strand, as opposed to school], so you can, like, all say your views, and that kind of thing".

"There's more talking between the students rather than it focussed around the teacher".

"I also find it's, maybe it's because of the subject, but it's not so much, 'Oh, let's sit down and write, and learn lots of facts, so you can pass an exam'. It's much more about, 'Let's discuss ideas so you can widen your knowledge and appreciation, and your understanding', that sort of thing".

"You're trying to learn from other people, and it's less about learning knowledge from a teacher, it's more about learning knowledge from other people".

These comparisons between school and the strand were deepened by the students, who were aware of the different purposes of school and the summer school course. They realised that they, and their teachers, had, in the summer school, been freed from the

demands, and restrictions, of curricula and examinations. But, their analysis also went further than that:

"In school, you generally don't really have this in school, you don't get the opportunity, at school. I guess school's not about thinking for yourself, it's more about passing exams, so you don't get this kind of freedom".

The sense that they were experiencing intellectual freedom was also matched by their recognition that the teaching staff had constructed the strand in such a way that the students had a good deal of freedom to choose how they were going to tackle a task, or an issue, or what idea they were going to examine:

"When [the staff] say that it's going to be based on what we want to do, *actually* based on what we want to do, effectively we can [choose]. I mean, they have decided a lot of topics beforehand, but we can decide what questions to ask. We come up with the questions. We've done that a couple of times [...] So we do *actually* get to choose".

The students were particularly excited by the balloon debate exercise they undertook (called 'Space Odyssey'), and by the way in which, once they had been told the aims and 'rules' of the exercise, the staff sat back and let the students run all the proceedings. The student interviewees all grew animated when they discussed the Space Odyssey, and one noted:

"And then we had to discuss it, and, of course, it was quite interesting, not only because of the things we were using to decide, but, also, the way we did it because [the staff] literally just sat there. It was quite interesting watching how we organised ourselves, which was quite a clever thing. So we got [to see] *how* we discussed, and *what* we discussed. Afterwards, we picked up some of the topics, like leadership, and what's right and wrong, I think".

The final element that the students felt made the course a good forum for teaching and learning was the nature of the group of students themselves. Once again, the summer school students identified a difference between their normal experience of schooling and

that of the summer school. They felt that one of the key variables was that all the students in their strand wanted to be there, and had an active interest in learning, unlike in school. The peer group was important:

"I think it's important that you put people together with similar interests, and similar level of experience, and so on. In a school class, you'll necessarily find that a large proportion of each activity will not want to participate, isn't interested, and, so, giving freedom that means the majority can, basically, be loud and talk about other things, and disrupt everything, so, you can't have a very free discussion".

2.5 Application

Drawing on the case study of the Philosophy: Argument Matters strand, delivered at the University of Durham, a number of points that are of potential relevance to others, are summarised.

2.5.1 Potentially relevant to NAGTY teaching teams

Planning the strand

- build on previous experiences of teaching at NAGTY summer schools
- book a comfortably-sized and suitable teaching room
- plan for the key purpose/s of the course
 - The key purpose of the Philosophy: Arguments matters course was to enable a responsive approach to students developing philosophical interests.
- Prepare a wider range of material than usual to allow for learning journeys exploring the depth and breadth of the subject/topic area
- Plan in highlights that allow the students to experience results (payback) after varying lengths of time and effort

Working as a teaching team

- select staff of a high intellectual calibre, with extensive subject knowledge and an interest in teaching bright school-age students
- continue using a successful teaching team, even if this requires a flexible interpretation of the team titles
 - in Philosophy Matters 2005, the Teaching Assistant was, in fact, a qualified teacher
- agree the principles underlying the teaching approach and put these into practice consistently
- work in a complementary, rather than hierarchical, way, using the skills and knowledge brought by each team member

Teaching and learning

- introduce key issues and concepts early on and allow the students to assimilate these
 - for example, in the Philosophy Matters strand, students assimilated the key concepts through the practical and creative task of making posters to encapsulate them
- allow students to practise and explore the learning skills required by the relevant academic discipline
- enable students to work on their own, in small groups and as part of the whole group
 - in Philosophy Matters, this aim was openly discussed with students and then put into practice again to encouraging more contributions from individuals within the group
- be prepared to situate students' own ideas within the context of the academic discipline, thus extending their knowledge and understanding
- reflect on students' progress with a willingness and ability to respond flexibly to support their further learning
- enable student-directed learning

2.5.2 Potentially relevant to teachers in schools

These bright young students responded well to:

- a relaxed, respectful ethos
- the use of conversations between teachers and students and, especially, to encourage students to converse among themselves
- being able to experience self-directed learning
- having the opportunity to work with peers who were interested in the subject and were motivated to learn

3. UNIVERSITY OF DURHAM, EXPLORING CULTURES TO DISCOVER ANTHROPOLOGY.

3.1 Introduction: setting the scene

The CEDAR fieldworker observed a short, 30 minutes long, anthropology class, focused on cosmology and magic. The class was held in a slightly crowded room, with the strand leader, and the qualified teacher equivalent (a doctoral anthropologist) at the front of the class, with the teaching assistant (a masters student) to one side of the body of students. The class was a power point backed talk, led by the strand leader. He used questions to elicit analysis that led to his next point, illustrated by a power point slide. In addition, the students were expected to ask their own questions, which the majority of them did. Hence, a dialogue developed in which new ideas emerged, new concepts were discussed, and the new material was related to previous learning. The strand leader drew upon his own research and fieldwork, describing his research among people in Papua, and used the power point to show photographs that he had taken, along with other illustrative material. Although the majority of students were actively engaged, there was one student who was not. The teaching assistant approached her during the session, and spoke to her quietly. The assistant later revealed that the student had experienced difficulties in settling in, and that she had been making a particular attempt to encourage the student to contribute, and engage with the class.

Throughout the class, there was a clear expectation that the students would ask questions, offer analysis, and draw parallels, both with previous learning, and with their own experience. This expectation was met, and the students were particularly keen to offer examples of cosmology and magic from their own personal experiences, be it the superstitions of family and friends, or their own reading on the topic. The atmosphere was relaxed, and conducive to discussion, teaching, and learning. In the short period of the class, the students had a good deal of scope for contributions, dialogue with the teaching staff and each other. In addition, the strand leader introduced a number of key theoretical points, and a number of anthropologists, for example, Frazer and Malinowski.

3.2 Planning the strand

The strand leader had been in charge of the anthropology course at the Durham NAGTY Summer School for two years, and had developed a flexible, clear structure for it. He had taken the opportunity presented by the summer school to develop a teaching and learning package that was innovative for the subject area and, potentially, applicable to various age groups. He believed that there was scope to introduce anthropology as a school subject and to develop it further at University level.

The strand leader had two key objectives in planning the summer school strand. The first was to introduce the students to thinking and working as anthropologists, the second was to develop a practical teaching programme that would provide a flexible teaching resource, much of which could be supported by a computer software package. This was done in 2004, and the Durham anthropology strand team added to, and updated, the package for the 2005 summer school.

The anthropology strand students were each given a 16 page booklet at the start of their course. This booklet, gave information about all the teaching team (including staff who were involved with the delivery of only a few parts of the course), the topics to be covered, and a day-by-day timetable. The booklet highlighted the way in which the outline of the course was clearly defined from the outset. Flexibility came in terms of the response of the teaching team to the interests of the students, within the framework laid out in the timetable. Flexibility was ensured by the teaching team having developed a bank of material which they could draw upon at will, in response to the emerging interests of the students. The use of the course-specific computer software package also enabled the students to develop their own understanding of anthropology through the use, for example, of self-testing exercises on key concepts, or additional information on topics that they had examined in the classes.

The strand leader felt that the clarity of the team's aims - to help students think and act like anthropologists, and to develop a flexible teaching resource - had enabled them to create a focused, structured, but adaptable model for teaching anthropology.

3.3 Working as a teaching team

The teaching team was made up of a core composed of the strand leader, the qualified teacher equivalent, and the teaching assistant. In addition, other academics, and a qualified teacher, were occasionally involved throughout the course. However, the core teaching team was present at all times, as they felt that the students would appreciate the continuity represented by their presence, while benefiting from the involvement of others for specific purposes.

The strand had experienced a staffing problem in the week before the start of the course, when the appointed Qualified Teacher (who had participated the previous year) withdrew. This problem was solved by promoting the appointed Teaching Assistant (a Ph.D. student from the University of St. Andrews who had, in 2003 and 2004, acted as the strand Teaching Assistant) to the Qualified Teacher role. He, in turn, was replaced as Teaching Assistant by a Masters student from Durham anthropology department. As a result, the strand managed to maintain a high degree of continuity over the three years, not only in terms of the structure of the course, but also in terms of the staffing. In fact, the original qualified teacher was able to be involved in some sessions, as were academics who had contributed in previous years. The strand leader felt that this dual continuity was important to the success of the course. Indeed, the qualified teacher equivalent argued that the course had taken advantage of the discrete nature of anthropology's sub-disciplines, and the interests of the teaching staff. As a result, he noted that the course had been built around the varying areas of expertise of this teaching team:

"I think that part of the strength of the school, or part of the fun of it for the academics, certainly, and I hope that transfers to the kids, is that there is no overarching syllabus that we have to stick to, so it's always been left very open to us what we teach. Anthropology, by its nature, splits into very significant parts. So, in the first year there were four of us, well, three of us, plus the teacher, we all had different abilities and different things that we wanted to teach, and we were able to jig it around so that we all got a go at passing on our own speciality of an area, which was nice, it's very nice to have that. [...] So, from me, they got, yesterday, a lesson on evolution and psychology, which is my field, and

tomorrow the other teacher is teaching them medical anthropology, which is hers".

The team did not just build the 2005 strand on the previous two years events, even though they were able to benefit from the working relationship that they had built up between them. They also constantly reviewed, and discussed, their planning for the 2005 strand. They did this through e-mails and telephone calls, during which they 'used our cumulative experience of the last few years to iron out issues'. The team was aware that a constant review of how the strand was progressing was essential, and, during the presentation of the strand, had a 'wash up' session every evening, where they assessed the day's events, and addressed issues that they felt needed attention, and, perhaps, would lead to changes for future strands.

3.4 Teaching and learning

The interviews with the students, and the two members of the teaching staff, revealed interesting aspects of teaching and learning on this strand, including some tensions that existed concerning the delivery of the course.

As had been apparent in the session that was observed, there was one student in particular who did not seem to be engaged. This student was one of the students who was interviewed, and her critical approach to the strand appeared to act as a catalyst with the other student interviewees, resulting in some critical analysis of the processes of teaching and learning. These issues were also reflected in the staff interviews, and, together, the interviews proved useful for an understanding of teaching and learning on the NAGTY summer school strands.

The disengaged student was very vocal, in the interview, about her inability to learn on the strand. However, her analysis was opposed by another student, who was excited and engaged by the course. Both these positions had been noted in the class observation. What was of interest was the fact that the contrasting views of these two students helped the entire group of student interviewees to explain what aspects of the course they felt aided learning, and which did not. This analysis was reflected in the staff interviews to some extent.

The disengaged student's criticisms focused on two main areas - too much teaching in a 'lecture' style, and too much written work. About the 'lectures', she commented:

"You go into a room and you sit there and they just go through [power point] slides for about two hours, talking at you, in the same tone of voice for ages, and it just drags on".

This criticism was immediately countered by one of the other students who argued that it was necessary to be engaged in order to benefit from lecture-style teaching:

"I think that is up to people [that] if you don't really contribute, because some people, just sit there and listen, because if you contribute to what they are saying then you'll enjoy it more".

This exchange matched quite neatly with what had been observed in the anthropology class by the CEDAR fieldworker. The 'lecture' was not characterised by the teacher talking, and the class sitting in silence, but, rather, it had been an interchange between the teacher and most of the students, based upon a power point backed presentation. However, the qualified teacher equivalent, in his interview, did admit that he had, in fact, delivered a lecture that may well have been more like a traditional undergraduate lecture:

"I gave, by my own admission, a slightly over long lecture on primates the other day, that pushed me, I think. It went on for over an hour, and the kids, by the end of it, were a bit glazed, but I don't blame them for it [...] Next year I'm going to readdress the primate lesson".

The teaching team had decided that some 'traditional' lectures were appropriate for the students, but there was a sense that they were re-considering that aspect of their teaching. However, the strand leader did make the point that he felt that strand leaders should, somehow, be involved in vetting potential students, to avoid the attendance of students who were not sufficiently engaged.

The students' discussion of the lecture issue enabled them to focus on the type of teaching and learning that they felt was most useful. Whereas, with the exception of the disengaged student, there was some recognition of the usefulness, and, more particularly, the necessity, of having 'lectures', there was a clear feeling in favour of activities that they described as 'interactive', especially activities that involved them in group work, and gave them more freedom of choice over how they could approach the work. Talking about small group work, one student commented, "we all love it", to the general agreement of his peers. When asked about the sort of work they liked, one student replied:

"I would like more of, like, interactive stuff, where you're allowed to go and do stuff on your own, and it's not like doing this four page assignment. You go and find something fun about the subject that you're doing, and then you come out, and you're in front of the class, something like that, because I found, like, some funny monkey stuff, and I showed that at a presentation. And, I think, was it you [another student] that did the television programme as well ? And they made it really funny, because they did a news story, and we had to guess which monkey had escaped from the zoo [...] and I liked that".

This was the general view, and the students once again contrasted the parts of the strand where they had been able to undertake interactive learning (of which there was a good deal, for example, small group IT-based research, and presentations) with the 'lectures':

"I think sometimes the lectures go into too much detail for our sort of level. I think, sometimes, they do go too, well, most of them go too in detail. But, I don't know, I think we need the lectures at the beginning to sort of introduce it, and get the basic knowledge, before we do all the interactive researching, and stuff, so I'd like to cut the lectures down a bit. But, like today, we were doing tests on each other, and, like, that was really fun, but, then we had to, at the beginning, we had to have it explained to us what we were going to do, like, what the subject that we're studying is about, and I think it, I think it's necessary to introduce it first".

Fieldworker: "But shorter introductions?"

"Yes, a little bit shorter".

The second criticism raised by the disaffected student, and partly endorsed by the other students, was the amount of written work that was expected of them. Again, there was some reflection of this issue, albeit from a different angle, in the interviews with the staff. Both the strand leader, and the qualified teacher equivalent, felt that it was not clear whether the summer school was primarily an academic experience, with some social events added, or whether it was primarily a 'summer camp'. In previous years, students had been given written 'homework', which caused resentment, but that had been discontinued by the summer schools. Nonetheless, the student interviewees from the 2005 strand felt that they were required to write more in the way of assignments than they would have liked. All the students agreed that they felt they had too much to write, and not enough time to do the work in. They would have preferred other methods of assessing them, perhaps on their presentations, or their posters, or something like log books:

"And they say that we have to, like, do it [the assignments] so that they have something to grade us on, but, like, we do so much other work, like presentations and that, they could just grade us on that. And it's meant to be enjoyable for us, making us write a four page assignment is kind of taking away some of the fun out of the two weeks".

The teaching and learning issues raised by the students were also addressed by the staff, who were aware that running the summer school strand necessitated a constant reflective approach. There was also a need, in the view of the staff, for the students to be responsible for engaging with all aspects of the course.

3.5 Application

Drawing on the case study of the Exploring Cultures to Discover Anthropology strand, delivered at the University of Durham, a number of points that are of potential relevance to others, are summarised.

3.5.1 Potentially relevant to NAGTY teaching teams

Planning the strand

- ensure a suitably-sized teaching room is booked
 - Exploring Cultures to Discover Anthropology took place in a room that was slightly too crowded for comfort
- build on previous NAGTY summer school experience
- be clear about the course objectives and ensure that these underpin the planning
 - for example, in Exploring Cultures to Discover Anthropology, the two key objectives were to introduce the skills required by the academic discipline of Anthropology and to create a flexible teaching resource that would have other applications
- plan a clear structure for the course but also plan flexible routes through that structure
 - planning for flexible learning paths requires a bank of resources to be prepared but enables self-directed learning during the summer school
- ask for prior information about the potential students on the strand to ensure that all are likely to be engaged by the subject and approach

Working as a teaching team

- be prepared to interpret the teaching team titles flexibly in order to assemble an effective team and to enable those with previous experience to be employed again
 - In Exploring Cultures to Discover Anthropology, the 'Qualified Teacher' was a PhD student and the 'Post-graduate Teaching Assistant' was a Master student
- spend time together *prior* to the summer school planning, discussing and reviewing the plan

- draw on the interests, skills and expertise of individual team members
- use the Teaching Assistant effectively, for example, to engage students one-to-one
- spend time together *during* the summer school reflecting on how the course is going and deciding on how to adapt the plan in the light of these reflections

Teaching and learning

- establish a clear expectation of active student engagement
 - be aware that this means that students will not then expect to do much written work nor to be taught through 'passive' means, such as listening to lectures
- establish a relaxed ethos, conducive to discussion, teaching and learning
- be prepared and able to situate the work covered within the academic discipline being studied
- the pitch of the content is important - avoid overwhelming students new to the subject with detail
- be aware that the NAGTY summer school places equal importance on the students' social and residential programme - do not expect academic work to be done outside the teaching day as the students have a full programme of evening activities

3.5.2 Potentially relevant to teachers in schools

The Qualified Teacher (in fact, a Ph.D student) on the strand highlighted the following points as potentially relevant to other teachers:

- ensure the attention of the group is engaged - use kinaesthetic activities to encourage engagement ...
- ... but be aware that these bright students can also be engaged in learning through listening, note-taking and conversation
- structured debates can be a useful means of engaging them in learning
- be aware that what looks on the surface like sullen and withdrawn behaviour may be masking a lack of self-confidence and that such young people often respond more positively during one-to-one conversations

The bright young students on the Exploring Cultures to Discover Anthropology strand clearly engaged most fully in:

- interactive teaching and learning activities
- self-directed learning activities.

4. THE UNIVERSITY OF YORK, PHYSICS - IT'S AN AMAZING WORLD OUT THERE!

4.1 Introduction: setting the scene

The observed session on the York physics strand was a one hour 15 minute lecture held in a physics laboratory. There were 18 students, 14 boys, and four girls. In addition to the lecturer, the qualified teacher was present. The class began with a question and answer session on the hottest and coldest temperatures. The students were keen to answer, and a dialogue developed between the lecturer and students. This was followed by the main body of the lecture, although students raised points, and asked questions throughout the session. The lecture was clear, well-structured, and built around a power point presentation, with links to a number of websites, and a small experiment that illustrated one of the key points of the lecture. The lecturer also introduced the students to log scales, which linked with work they were to do that afternoon. After the illustrative experiment, the lecturer moved on to a discussion of insulation and the role of magnetic fields in the insulation of very hot and very cold objects in experimental conditions, for example, in the Joint European Taurus. This led to the lecturer's own research field, which was plasmas. Students were then invited to ask more questions, and, finally, the lecturer summed up his talk.

4.2 Planning the strand

The York University physics department operated a rolling staffing system for its NAGTY Summer School strand. All the strand leaders were volunteers, and were involved with the summer school for two years. There was, therefore, a high degree of continuity from one year to the next, and the teaching team was able to draw upon accumulated planning and teaching experience, as well as a bank of summer school resources. The strand leader outlined this process:

"The way that the physics programme has operated is that, first of all, there are two academics, one person who kind of runs the organisation, the second is a kind of shadow, so then the following year they become the leader. So when I first worked with the NAGTY programme, starting last year, I was working with

[academic's name]. He is no longer involved with NAGTY, and, right now, he's on a research sabbatical. So, this is my second year; likewise, next year, I'll be on a research sabbatical, so I won't be involved [but my shadow will be the strand leader".

The strand leader felt that this system not only maintained continuity, but increased the likelihood of academics volunteering for the summer school, which consumed a good deal of time, and was not regarded as being of benefit to the academics' careers. The time that a strand leader had to devote to the organisation of the strand, and involvement in its delivery, was quite considerable:

"It does all add up because I'm involved for the two weeks, I'm pretty much involved with the students, and it took me two, or three weeks, of just solid work, organising the excursions, making sure that the experiments worked, to rewrite the laboratory scripts to a level that the students can perform, writing up the various lectures".

The awareness that the summer school represented a significant inroad into research and writing time was part of the reason why the planning for the course stressed the need to involve other members of the physics department. This had the added advantage of allowing the students to be exposed to academics who were experts in particular fields of the subject:

"If I was giving advice [to a new stand leader] it would be don't do everything yourself, really try and bring in other members of the academic staff to give an hour's talk, I mean, to give an hour's talk, it's not a huge investment of time, but, if you've got to prepare yourself, ten hours of lectures, it's huge amount of work. So, really try to get that help. [...] So, certainly, that would be my advice [...], and that determines your programme to some extent".

An example of this integration of 'outside' speakers into the course provision was the use of a physics academic who had a particular interest in the physics of music, and gave a lecture on this topic to the strand. This was mentioned by the qualified teacher, the students, and the strand leader as a particularly successful session (see section 4.4).

With the physics strand being partly determined by the availability of academics, and, building on the experience of the previous strands, the strand leader developed a model that would shape each day of the two week course:

"We have a model - the model for the day is a lecture in the morning by an academic, so that's an hour, an hour and a half, of questions, a break, then we have two hours of exercises headed by our teacher, then lunch. After lunch, I do experiments. Now the experiments, we do group work, so we split them into groups of three - we found that to be a pretty useful number for group learning and experiments - everybody is still able to touch the equipment, and we try to make sure that people don't hog the various tools. So we try to make sure everybody's taking some records, and no-one's holding back [...] and then we disseminate the information, and collect the results from the different groups, we have them explain everything about the experiment [...] So we have this dissemination - it's all in groups of three - so that means we have six experiments".

This model therefore gave a clear threefold structure to each day of a lecture, followed by topic-relevant activities organised by the qualified teacher, and group-based activity. In addition, two day trips were built into the course, which were closely linked to other teaching in the laboratories and lecture room. In the first week there was a trip to Jodrell Bank, and in the second week there was a trip to the dark matter facility at Boulby Mine on the north-east coast. Planning for the entire strand therefore revolved around issues of time constraints, available academic inputs, a universal daily timetable outline, two field trips, and the contribution of different members of the teaching team.

4.3 Working as a teaching team

The structure of each day gave every team member a clear, and to some extent, discrete role to play in the delivery of the course. The strand leader saw his role as being to lead the experiment-based activity, which occupied the afternoons, while the qualified teacher's role was to provide additional material, during the pre-lunch session, that would ensure that the students possessed the necessary knowledge or theoretical tools

to engage with the lectures, or the experiments. The graduate teaching assistant role was to act as an informed classroom assistant in both activities run by the strand leader and the qualified teacher.

The qualified teacher was provided with the course outline prior to the start of the strand, along with worksheets and power point presentations from the previous year's strand. These she used as the basis of her teaching input:

"We'd agreed that we were going to stick with what happened last year because part of that had worked very well [...] So, I came in with worksheets from last year, and power point, and I've just adapted those, [the strand leader] e-mailed them to me, and I've used those as my starting point, in everything, and without that I'd be stuck".

Nonetheless, the qualified teacher discovered that the basic lesson outlines were, in some cases, pitched at too high a level for the students, and she had to adapt what she had received:

"To start off with, I was using some quite challenging worksheets, and, although it's great for them to be challenged, they weren't for me ... in standard form, they had problems coming up with, you know, all sorts of numbers that weren't right, what they were doing was right, but they weren't using the maths properly. So, we sort of went back to basics for a little bit, with that, and now I've been doing logarithms, and there are only two in there that have done logarithms at school".

This example illustrates the way in which the role of the qualified teacher was clear within the teaching team, something that was noted by both the strand leader and the teacher herself. The strand leader explained:

"I think it's important for an enthusiastic teacher...I mean [the qualified teacher] really is much better than me at judging the audience, coming up with activities, and reinforcing some of the lectures from the morning, she builds upon that. And so, she's helped to develop some of their maths skills [...] So, the teacher, I think their role is to pick up on topics in the lecture, and see how to best reinforce

those things. And so I kind of left that part up to her, my job is to look into the physics, and reinforce the activities in the afternoon, the experiments, with what's in the morning. And so, the way in which the teacher and I interact is, I want to make sure that we do the experiments in the afternoon, that we can carry on [...] so that they can use it in the lab [...] and so on. So I'm kind of looking after physics, and she's more the skills that should be reinforced to complement".

The qualified teacher, in her interview, gave the same picture of shared responsibilities, and had a clear idea of how her role supported the teaching and learning carried on in the rest of the strand. She gave an example of how she had reinforced teaching on quantum physics that had particularly engaged the students, and where she had ensured that they had the necessary intellectual tools to fully understand the lecture element of the course.

4.4 Teaching and learning

The strand description which potential students were able to access prior to attending the course described 'Teaching Methods' as:

"Each day will have a particular theme, which will typically be introduced by an academic with a demonstration-rich lecture. This will then be followed up with a variety of activities - typically group-work and/or worksheet-based activities, followed by hands-on practical laboratory work. There will also be several trips to places of special interest to physicists, and (weather permitting) there will be some night-time astronomical observation. There will also be some project work, where the students have to do some group-based research and then present their findings to the other groups".

The teaching staff, and the students, felt that this method of teaching based upon a variety of approaches placed within the integrated daily elements of lecture, follow-up, and laboratory work was a successful model. The model provided variety in terms of content and activity, and when, for example, the qualified teacher was asked to identify a

particularly effective period of teaching and learning she outlined an entire day's worth of activity as an integrated whole, rather than just one session:

"The Physics of Music one, on the second day, that was, they really enjoyed that. They had the demo in the morning, and the gentleman that took it, obviously, he's a physicist, a professional physicist, but, also, his passion is music. He brought in different pipes, and things like that, that they were referring to these when he showed them about six or seven demonstrations [...] And, then, in the afternoon, they worked excellently on their experiments based on physics and music. [...] They had a target at the end of it, and we evaluated the results at the end. We got them all together, and said, 'Well, why are all our answers different if we're using the same worksheet?' [...] Definitely the lecture and the topic gave it [the day] a good start, because, I think, he introduced areas [...] and then, when we went on to the classroom session they were interested [...] and they were working that out, and what note would that be, what frequency. They were really interested to start with, which helps with the classroom session. And then the practicals were fairly straightforward, the practical session, and the lab were really good".

A similar day's worth of teaching and learning was outlined by the strand leader in answer to the same question about an example of a successful session. In his case, the strand leader identified a day's worth of work on the topic of dark matter, a day that included a trip to the dark matter centre at Boulby Mine. Again, the key to this was variety, both in terms of content and activities.

The characteristics of the student group that identified their capacity for effective learning were clearly identified by both the strand leader and the qualified teacher. Making comparisons with undergraduates, both members of the teaching team said that they felt that the NAGTY students were both more intuitive in their understanding of issues, and more interactive. In particular, they were more likely than undergraduates to ask questions, often searching questions, even if they did not have the mathematical knowledge of older, university level, students. The strand leader commented:

"In some sense, it is all a reward because, just the pleasure that I get from interacting with really enthusiastic students who are asking very good questions. The interesting thing about their questions is that they won't have the mathematical background, or they're still young enough to have a fresh intuition of the way the world works, and so their questions are often penetrating, and deep, and simple, which makes me think more carefully about my response because [...] I have to come back and really explain in an intuitive way".

The qualified teacher was also excited by the students' capacity to ask questions, and their desire for as much information as they could get from the academic staff. She noted that the students would continue to discuss the topics during their breaks, and seek out the staff in order to ask more questions:

"In break times, I don't know if you've [been there]? That is, some of the lads sort of don't really talk to each other, but there's a big blackboard there [in the room where they had breaks], which is really good, so it's, like, one of them will say, 'You know that equation?', and they'll bring something up, and then he [the academic] will actually have a look, on the blackboard with them, and the ones that are listening, are like, 'But?', 'What about?', 'If?' And they're asking questions, and it's really good to see. They are really, genuinely interested".

4.5 Application

Drawing on the case study of the Physics - It's an Amazing World Out There! strand, delivered at the University of York, a number of points that are of potential relevance to others, are summarised.

4.5.1 Potentially relevant to NAGTY teaching teams

Planning the strand

- plan to incorporate into the course the area/s of research of those involved in teaching the students, as this provides the students with access to the latest knowledge

- for example, in Physics - It's an Amazing World Out There, the course included study of plasmas, the research area of one of the lecturers
- plan for continuity of the strand in a way that takes into account the workload involved
 - for example, in Physics - It's an Amazing World Out There, the strand leader was shadowed by another member of the department who intended to lead the summer school in 2006
- plan the strand in a way that allows the workload to be shared
 - for example, in Physics - It's an Amazing World Out There, a number of academics from the department were involved, thus widening the range of exposure of the students and spreading the workload for the academics
- structure the course in such a way that there is a sense of stability but also highlights to work towards
 - for example, in Physics - It's an Amazing World Out There, one trip per week acted as highlights within a stable, daily pattern of activities

Working as a teaching team

- ensure each team member has a clear and, to some extent, discrete role to play
- involve the Qualified Teacher in the planning so that that team member may also contribute to the teaching
- use the skills of the Qualified Teacher to ensure that the teaching content is pitched appropriately for the knowledge level of the students and to ensure that each student is moving on in their learning

Teaching and learning

- variety of content and activity within an overall, integrated daily structure worked well
- be prepared to answer questions - the NAGTY students are likely to have less subject knowledge than university students but be more willing to ask questions and participate in debates and conversations

4.5.2 Potentially relevant to teachers in schools

When interviewed, the Qualified Teacher on Physics - It's an Amazing World Out There! highlighted the following points as potentially of relevance to other teachers:

- like many other students, bright students enjoy variety in learning activities, therefore plan lessons in a way that avoids giving them 'more of the same'
- avoid routinely using bright students to explain their understanding of complex topics to other students but do allow them opportunities to present to their peers their own research on a topic of interest

5. THE UNIVERSITY OF WARWICK, CREATIVE WRITING

5.1 Introduction: setting the scene

The creative writing strand at Warwick University had 22 students, seven boys, and 15 girls. The observed session took place from 9.00 a.m. until 10.30 a.m. The strand leader, the qualified teacher, and the teaching assistant were present, and the room comfortably accommodated all the strand members, sitting in a horse-shoe shaped arrangement, with a power point screen at the open end.

The session opened with the students filling in forms, which combined an element of feedback on the course so far, and information about the writing that they were going to include in their joint, strand, book. While the students were doing this, the strand leader moved around among them, talking to them about literary topics, including, for example, Yeats and Keats. The students were relaxed, and chatted among themselves, and with the teaching staff. The strand leader also asked them all to think about writing that other members of the strand had produced that they liked, and they did this. The power point screen showed the web site of the guest speaker for that morning.

Once the initial tasks were complete, the strand leader introduced the guest writer, from Boston, USA. The guest speaker, David Greenberger, was a writer, small publisher, and website owner. He had published his magazine, *The Duplex Planet*, since the late 1970s. The hearts of both the magazine and website were built around accounts of encounters with men in old people's homes, and David Greenberger used this as a way of explaining the significance of personal experience for writers. He supported his presentation with copies of the magazine, other published work, the website, and readings. He was able to discuss creative writing, biography, self-publishing and other media projects. The session finished with questions from the students.

5.2 Planning the strand

The strand leader had been involved with the NAGTY summer school for two of the four years it has been running at Warwick University. He was strand leader in 2004, and drew upon his experiences then in planning and delivering the creative writing strand in

2005. He was also able to use almost the same core of teachers, so felt that there was a high degree of continuity between 2004 and 2005, and that his planning tasks were more straightforward in 2005:

"It's easier this year because it's modelled exactly on what we did last year. I think we have one new recruit [to the core teaching team], but that was fine because one of the old ones wasn't available this year".

He had been able to draw upon the experiences of the previous strand leader, who had led the course for the first two years of its presentation. He was clear that he had adopted a top-down approach to planning, creating a very detailed plan for the three week course, with input from the qualified teacher. He arranged for several outside speakers to visit the strand, and had to incorporate them into his overall plan. In retrospect, he felt that he had, perhaps over-planned, but that this was probably necessary, especially given that it was a three week course.

"I did work out in some detail a day by day outline of all three weeks. The days I didn't fill in, in probably excessive detail, were the days that were given over to guest writers. Although, even from them (they were very good about this), they sent in, weeks in advance, if not detailed plans, at least an indication of what sort of area they would be covering. And I could somehow space it out and link it with material that I would teach, somehow, to give a kind of flow, coherence to it".

CEDAR fieldworker: "So, actually, it was quite structured then?"

"Yeah, yeah, I was pretty nervous, the first year I was, just, you know, I think being nervous is a really useful thing. So, it made me do, probably, as I say, too much work".

One of the results of this detailed planning was that the teaching team had a reserve of material available, which gave flexibility, something that the strand leader saw as a strength - "that's no bad thing, if something arises and you have to improvise, you've got material".

Despite the strongly structured nature of the course plan, the strand leader was aware of the importance of responding to the views of the students, and was quick to free up time, for example, when the students argued that they needed more time to complete writing projects that they were engaged on. The plan was not seen as an immovable feast.

"They [the students] have had an actual impact on the design of the course. I mean, a group of four have said , 'We love everything you're doing, but we'd really like a period of two hours where we don't do anything so we can catch up, finishing all the things that we've done'. And I realised, 'Well, yeah, I should have built that in' [...] and I've certainly made a note for next year that there's going to be more free time to write".

In terms of the content of the course, the strand leader felt that the important thing was to have variety. The students were exposed to a series of teaching and learning methods, different writing exercises, field trips, and guest speakers. For example, one of the guest speakers brought stories about laundries that were physically encased in bars of soap, while another exercise revolved around postcards the students were given, on which they wrote about the lives of unknown people:

"Variety, you know, so that there is consistency, but, also, a variety to refresh them regularly [...] a variety of voices [...] the fact that, you know, there was me in the morning, then there was [for example] the ghost hunter/photographer, who's a natural story teller, and very funny [...] And then the variety of place, we actually left the campus, travelled by bus, and we were experiencing something altogether, then coming back and sharing perceptions".

"She [an outside speaker] came up with suitcases filled with what they call Book Art, so artists' books. There was a book made of soap. I think it was nine little bars of soap wrapped in a story, and the third was about a laundry woman, and in order to find the next instalment of the story you had to use the soap, and then you had to dry it out, and hang it out to dry".

5.3 Working as a teaching team

It was not possible to interview the qualified teacher, due to timetabling requirements, but the strand leader outlined the structure of the team, which was larger than for a typical NAGTY summer school strand. In addition to the strand leader, and a qualified teachers (two for the three work course, with one present at a time), there were also five 'deputies'. These deputies were drawn from the University of Warwick's creative writing degree, mostly being recent graduates. Each deputy was involved with the strand for three days during the course. The strand leader had a clear view of the differing roles of the core teaching team. The qualified teachers had a key role in monitoring the students' progress, and making the notes that formed the basis of the report on each student. The deputies had much more of a pastoral role:

"As for the assistant teachers [qualified teachers], who play a much more important role, and the deputies are invaluable, but, they're more, just, what do they call that? The pastoral thing. They help with the practical side of things. The assistant teacher has a much bigger role; they're constantly taking notes every day that will feed into the reports, which is a large part of what we do as NAGTY teachers, takes up a lot of time towards the end of the programme".

In addition to the core team of strand leader, qualified teachers, and 'deputies', the strand leader had recruited a number of outside speakers and practitioners who took sessions over the three weeks. The outside speakers provided a range of presentations and activities on a variety of topics associated with creative writing. An example was provided by the workshop given by an outside speaker who had the students create the mini-biographies of unknown people:

"And she also brought up beautiful materials, like, you know, beautiful cardboard boxes that fit piles of postcards, which they were instructed to interpret as a kind of portrait of an unknown person, and then cut them up, or write a set of instructions, of how they'd use them in an imaginary game. And at the end, you know, they'd all made their own book works in these boxes, with lettering on them - oh, it was an incredible, really beautiful thing for them to do".

5.4 Teaching and learning

The interview with students from the creative writing strand identified four central elements in the teaching and learning experience of the course. The students noted that the strand was characterised by a relaxed atmosphere, that was conducive to learning; the student group was inclusive and positive in its attitude to learning; there was a good deal of intellectual freedom on the course; and the members of the teaching team were seen to be good teachers. These points were also highlighted by the strand leader in his interview, and, together, the two interviews generated a clear picture of the processes of teaching and learning on the strand.

The students noted that the atmosphere of the creative writing strand was more relaxed than at school. This was, they felt, a result of a number of factors, for example, one student argued that:

“It’s a lot, like, more relaxed, because everyone wants to be here, and because it’s a smaller class, as well, you get more attention from the teacher”.

All the student interviewees noted that their course peers were interested in the work, were positive about learning, and good to work with. They said that they felt at ease among the other students; that, for example, they did not feel embarrassed about reading their work out in front of the class, and that no-one was disruptive:

“I think it’s much easier to read work out, because everyone’s reading everything out, while, in school, it’d probably just be like a couple of people”.

“Here you know that, like, everyone sort of wants to read out, wants to hear what you’ve written, but in school, it’s like you’re too afraid to get embarrassed”.

“At school, the teachers are more concentrated on getting the ones who don’t want [to work], they just mess around all lesson, [the teachers] spend most of the lesson trying to get them to do something. Here, everyone wants to do it”.

The peer group were also seen to be engaged, and working with the other students was seen to be a good way to pick up new ideas:

“Here, everyone is good at writing stories”.

“It’s very refreshing, other people have ideas that you can pick up from, just little bits of ideas”.

The strand leader also commented on what he felt was a difference between the school experience of some of the students, and the experience of being on the creative writing course. He had experience some initial resistance in the previous year’s strand to participation in the classes, and was puzzled until he realized that he had to convince the students that the strand was a safe arena in which they could present their work without fear of ridicule. His analysis was that they experienced problems from peers at school, and had expected the learning environment to be the same at the summer school:

“We did have the problem where in the first, say, two or three days of the first week there was a row of boys sitting with their arms crossed over their chests, and their hoods up, refusing to participate [...] because they thought it was uncool [...] But then I began to realise that it was, they knew that in their normal schools it was dangerous to show that you were smart, and you could do it. So, there’s much more than just being uncool, and then when they realised it was safe they dropped their guard and, you know, what can I say? By the end of week three we were all hugging, you know, it’s amazing what a bond can be forged, meeting kids all day, for fifteen days, you know, and they wrote poems for me, and thank you cards, it was very touching, very moving”.

Even those students who had experienced creative writing in school felt that they had been restricted in what they could write about. They were aware that their teachers were bound by the curriculum and by a need to get their pupils to write ‘correctly’. By contrast, the students felt that the creative writing strand was characterised by intellectual and creative freedom, which they greatly appreciated:

“There isn’t an incorrect manner [of writing] here; it’s like freedom of expression and freedom of speech”.

“The freedom makes it exciting. You can do whatever you like”.

“It’s not like you sit there for two hours with a notebook and a pen writing a long essay about an unknown person [...] You could do it in any way you want to, which was really good”.

“At school, it’s more like constricted what you have to do, where they give you a certain, a lot of grammar, but, here, it’s just like they give you a sort of general idea, and he encourages us all to write different things”.

These comments reflected one of the aims of the teaching team, which was to remove the boundaries that the students had come to expect at school, in order to allow them to think more deeply about the nature of writing. The strand leader noted:

“I said [to the students...] What I’m interested in is presenting to you a host of possibilities that, you know, precisely what some of us wouldn’t be expecting you to do, things more, you know, it might even look like bad writing at first, you know, ‘But they’re not punctuating correctly, or their grammar’s all up the spout, or that’s not the right word in the right place. Yes, to look at what looks like distortions, or aberrations, or downright gibberish’. And so we look at things like, I mean, G. K. Chesterton, of all people, he wrote an impassioned defence of nonsense”.

The student interviewees were also very appreciative of the wide variety of teaching methods that they experienced and the different experiences that they had. They talked, in particular, about two of the teaching experiences – one built around a visit to a ruined house, and the other a visit from the London based speaker who had the students create biographies with postcards, and brought the ‘soap books’:

“The lady that came from a museum in London, and she brought with her over a hundred postcards belonging to the institution, and she got us to make a project

using boxes, based on this unknown figure [...] so we made work, concertinas and stuff, things on stuff that she had chosen...”.

“There was such a range of things we could do with it, and it was like we’d never get to do that [normally], the afternoon was so brilliant, that was, that was great”.

“She had all kinds of books. The ones with soap, yeah, you wash them, and the pages were inside and it was inspirational”.

“I’d never known that there were such books, but, like, introducing like a whole, you feel the creative writing”.

The sense that they were involved with teaching and learning that they had not previously experienced or imagined was picked up by the strand leader, when he was talking about teaching that he felt had gone well:

“The ultimate thing you’re teaching them is how to be their own teachers, so that they can be curious, that, ‘Oh, gee, I’ve never thought about that, I’ve never tried that’, you know”.

The students were also excited by meeting writers, and people who were involved in creative projects. They valued encouragement and advice from people whom they felt had first-hand experience, and were not ‘just’ teachers. But they also valued the teaching skills of the team, and the outside speakers:

“Our teachers, [strand leader] he is just amazing, he makes everybody feel like they’re all [...] like they are a writer, like you should be up there in, like the Waterstone’s best selling list!”

“It’s nice hearing it from an actual, proper writer, and he’s, like, a writer”.

“The other great trick was from a woman who really gave us a lot of confidence. She came to do story telling. And we were all kind of self appreciating ourselves, going, ‘Oh, my story’s kind of bad’, because it’s like day two or three, and she’s

like, 'No, you are not to say that, you are all to say the story is wonderful'. So, we were like, 'Ok, read my story, it's brilliant'".

5.5 Application

Drawing on the case study of the Creative Writing strand, delivered at the University of Warwick, a number of points that are of potential relevance to others, are summarised.

5.5.1 Potentially relevant to NAGTY teaching teams

Planning the strand

- book a teaching room that will comfortably accommodate the number of students and the activities planned
- build on prior experience gained at NAGTY summer schools
- be clear about who is in charge of the course planning - if it is the strand leader, ensure the qualified teacher is kept informed and is able to contribute
- plan coherence into the two or three-week course
- prepare a bank of resources which will allow for flexibility in the teaching and learning during the course

Working as a teaching team

- if possible, have continuity in the teaching team from year to year
- interpret the NAGTY teaching team flexibly to reflect the needs of the strand
 - for example, on the Creative Writing strand, the team was larger than usual on a NAGTY summer school, including two qualified teachers (one at any one time) and five deputies (i.e. recent graduates)
- ensure each member of the team is clear about the respective roles
- the qualified teacher role enables monitoring of the progress of individual students

Teaching and learning

- be responsive to the students' views
- create a relaxed, purposeful atmosphere, conducive to learning and to sharing creative work without fear of ridicule
- use the teaching team to ensure each student gains from individual attention
- use visiting speakers as role models and inspiration for the students
- allow sufficient time to enable the students to write up their learning in their own way
- variety of content and of teaching method, as well as a range of guest speakers and field trips all helped to engage students
- allow students the intellectual freedom to engage in self-directed learning and exploratory work, freed from the bounds of the school curriculum
- build in opportunities for the students to work together and to learn from each other

5.5.2 Potentially relevant to teachers in schools

- even bright, creative students need encouragement to learn "*the great trick*" of confidence in their own creations

6. THE UNIVERSITY OF WARWICK, LAW AND LEGAL ISSUES IN CONTEMPORARY SOCIETY

6.1 Introduction: setting the scene

Timetable issues meant that no lesson observation was carried out for this strand case study.

6.2 Planning the strand

The law strand leader had been the lead academic on the strand since its inception in 2004. He was one of three academics who had responsibility for the three week course, but he was the main planner. The strand had undergone a number of revisions since its first presentation in 2004, as a result of the strand leader's reflections on the success of that summer school, and the feedback he had obtained from the students that year. The 2005 strand was built around some basic principles that the strand leader had developed for the NAGTY summer school students. Given that the course was three weeks long, he felt that it was necessary to have a unifying theme or project to hold the elements of the course together. In addition, he thought that it was a good strategy to think of an idea that would appeal to the students, and to construct some aspect of law education around it. Finally, he felt that the principles of avoiding lectures, and activities being presented in small sessions, were good rules for the class-based work.

When he was first faced with the task of planning for the three week course, the strand leader felt that the biggest question was, 'how do you fill three weeks on the subject?' It was necessary, he thought, to have a project that would increasingly act, as the course progressed, as a course unifier:

"I sort of struck on the idea of making the three weeks culminate in a court hearing. That's very important in the final week, in particular, because it gives a real focus - people are going to have to stand up and they're going to have to be videoed, as well. So, there's a product, and there's also a little bit of pressure, as well, just to focus their minds in the last week".

The strand leader had also reviewed and revised the programme following on from the experiences of running it in 2004. He felt that some of the events had not been as successful as he might have liked, and, as a result, he revised his approach to the planning, and designing of elements of the course:

“Actually, this year, I took the lead from some other groups, and I thought, ‘Well, I’ll start the other way around, I’ll think of something fun to do for them, and I’ll find the legal relevance afterwards’. So, in the end, we went to Warwick Castle for a day, and we used it as a starting point to talk about the ideas of feudal society, kings, and medieval punishment, so we looked at it the other way round and were led by enjoyment first”.

Nonetheless, most of the elements of the 2004 strand were maintained, including a successful trip to the National Museum of Law. This was seen to be successful because the strand was able to take advantage of an existing, professional educational provider:

“We turned up at about ten o’clock [...at] the National Museum of Law [...] and they looked after us pretty much solidly from half past two in the afternoon, taking us through a number of exhibits, a number of interactive courts, activities also, with a very professional [staff]. There was a lot of humour in it, and grim realities of Victorian prisons are brought home, so it was a great, great day”.

The strand leader adopted two basic principles for campus-based teaching days – that they would avoid lectures, and 45 minutes would be the maximum length of any session. To some extent, this was an atypical approach, as longer sessions, and lectures, are not uncommon on the summer schools. The strand leader felt that the classes should be enjoyable, and that the question of attention spans was important. In addition, his experience with NAGTY students made him aware that they were always keen to ask questions and contribute, and, as a result, lectures were not the best format for teaching. Commenting on these points, he said:

“So, today, we started with a, we watched about a 40 minute video, that was the end of the film that we started watching the other day, and then we did a logic quiz, and then we did sort of a more sort of hard stuff where I wanted actually to

get something out of it, and the legal content. So that's the, I suppose, the reason why we chop and change it, because it is the enjoyment, and it's the attention span, and I really think that 20 minutes [...] sort of what you do in that time will work in that context, rather than an hour of that. The 'no lecture' thing is just, I think, as I say, their hands go up so much, and they've got so many questions, that I think just to, just to lecture them, I mean, I wouldn't enjoy myself, probably, just saying 'this particular view of something'. I think it's more fun to do it in a form of a discussion, or a debate, or just have a show of hands, or be prepared to take questions on..."

The result of this thinking was that the class planning was built around the ideas of changing pace frequently, and ensuring variety in terms of topic and activity.

6.3 Working as a teaching team

In addition to the three law academics that took the central teaching role, one per week, throughout the course, there were two qualified teachers, and a teaching assistant, who had a supporting role. One of the qualified teachers was interviewed. She had no specific subject knowledge (being a languages and science teacher), but felt that this was not an issue as her role was not as a subject teacher for the strand. She felt that she was adequately briefed for her role, and was quite clear about her part in the strand team:

"I had a meeting with [the strand leader] when he came to interview me at [school], and then, since, a briefing meeting one evening with the rest of the team, to meet everybody, and to have an idea of what we would be doing. I was given a list of each of the topics that we would be covering each day. So, then I would go away and look at some of the ideas for the weeks that I was involved in, to have an idea. Last week, I was given a copy, usually a day in advance [...] and the others I've just come in and picked up with the children as we're going along, really".

"I was briefed on what I would need to do in terms of supporting the students, and acting as a go-between, if the work was too difficult for them, or if they felt

they needed challenging, and just being a bit of a go-between, as well. So, the same with any classroom management situation, I think: putting them into groups for different activities, running games, here and there, just to help them keep the momentum of the day, keep their interest”.

In addition, the school teacher felt that she had a vital role in preparing and writing up the reports on the students’ performance in the strand.

The qualified teacher felt that the law strand team worked well together, and that the key to their successful team work was clear communication between all the elements of the team:

“I think open communication, really. Before I came in this year [each teacher/academic] had their own style of working. I made a point of [taking] a slight step back initially, to see what sort of role the person delivering the lesson would be having, and how much they would want me to get involved and to do things. They’re the main lead person, really; I’m supporting and working with the students within that. So, yeah, just establishing that personal communication, really. And if you think something needs doing, just get up, ‘Do you want me to do that bit?’ Or, you know, ‘Is there anything?’ And, at the end of the day, if I’ve thought that there were students, perhaps not working as well with them, then just having little discussions about [...] how we all think that the students are doing. Just open communication, really”.

6.4 Teaching and learning

The student interviewees were very reflective about teaching and learning, both on the strand and in their schools. They were extremely positive about the strengths of the teaching and learning experience on the law strand, and compared their normal schooling experience unfavourably with the summer school experience. They were very clear why they felt that the summer school course was a good learning experience, identifying the interactive nature of classes, the freedom to discuss issues among themselves and with the teaching staff, the quality of the academic teaching, and the variety of methods and topics.

On being asked about teaching and learning, the students moved quickly to talk about the differences between school and the law strand. They first identified some basic, but important, points:

“The way we’re expected to work [on the strand] is different in terms of at school where we’ll all be in possibly a seating plan, and then there’ll be the teacher at the front of the room, with a board, just writing stuff down, and we have to answer questions out of a book, or something like that. Whereas, here, it’s kind of more interactive kind of setting, in terms of we can make posters about legislation, and stuff like that, it’s a lot more, it is different, completely”.

Another student immediately agreed with this statement, and focused the discussion on the teaching method being used by the academics:

“Yeah, [Name] called it the Socratic method, that’s what it is. The teacher teaches by asking his pupils questions”.

The student interviewees thought that this approach was very successful:

“It encourages people to, if they are going to be quizzed on it, I think it encourages them to just generally take what they’re learning in, in a greater degree of detail, because they’re more, they’re more inherently involved in it by way of their teachers have, more or less, having a conversation with them rather than lecturing them, that’s the difference”.

This statement, ‘having a conversation with them rather than lecturing them’, seems to encapsulate the most successful approach to teaching and learning on the summer school strands. The law strand leader also noted that his main aim had been to get the students participating in discussions, in conversations with the academic staff and with their peers, as a prelude to developing listening skills:

“The first two weeks of this, we’ve encouraged them to voice opinions and, perhaps, we’ve encouraged them to broaden their approach to certain ethical,

and moral, and social debate. Not just encouraged them to try and stretch themselves, give an opinion, engage, get interested. The third week we've actually – and this is sort of in terms of their development – we've tried to take the more, 'Now we're trying to...', a little bit. And they're sort of, it's learning to, how to listen to others and particularly to see the other side to an argument, and this is the key thing, I think, to the sort of, the lawyer skill to have, is not to be, because I think teenagers can be quite opinionated [...] they pick them [ideas] up, and that's really, it's to challenge what they've inherited in all sorts of ways, from the media, from their parents, it's to challenge the world".

The result, for the students, was that they felt that they were much more involved in the process, and that, as a result, they were experiencing deep learning:

"You're more likely to be involved in it, whereas at school, you'll find that there are a few people that maybe will sit at the back and won't participate in the lesson as much as some other people, whereas, here, that's not really possible. Everyone has some say in what's going on, usually".

"I would say that we're covering it in a way that it doesn't suddenly leak out of your mind. There are certain little technical bits and pieces that, occasionally, people get stuck on, like, you know, oh, I can't remember the exact definition of moral relativism, or something like that, but, you know, all in all [...] you recall in bulk the general principles. You know, you'll be covering something a couple of weeks later, and you'll think, 'Oh, yes, we covered this a few days ago, and, yeah, this is what she said about it'".

"Yeah, here you get more involved in what you're learning, rather than simply answering questions or 'just copy something from the board'".

The student interviewees noted that the classes did not focus on the teacher, but, rather, they all took part, and that they were learning from the discussions they had with each other, and the academics. This gave them the sense that they were involved in an intellectual exercise that developed in an atmosphere of freedom of choice, and led to

greater understanding. In an extended discussion between the students, they developed this idea with great clarity:

“Like I said, I think in normal schooling [...], I probably would refer to it as being taught, not being taught *to*, but being taught *at*, you know, whereas here you’re actually having a conversation with them”.

“Your own opinion is open to judgement here, that’s the thing. It can be quizzed, and criticised, by your own peers”.

“Everything here is more concentrated and more intellectual”.

“And we’re very intellectual here, which is what I like about it”.

“It’s very different here because, at normal school, the subject that you learn in schools [...] they tell you, ‘You must do this otherwise there’ll be detention’. Whereas, here, it’s sort of you have the choice to do it, and since we’re all here, most of us have taken the choice to do the work rather than just to sit it out”.

“[I’m more] bored in normal school than here because of the way that we learn. It’s more engaging; it’s more interactive. We’re all here because, all of us kind of like [want to be]. Having intellectual discussions at school may not be possible, even if you are in the top set, and everyone should be on the same level, it doesn’t really happen that way a lot of the time”.

“It helps to hear people, even if they don’t know completely what they’re talking about, they have a kind of sense of what they’re talking about, they have a grasp, they know what this is they’re getting themselves into, so that they can’t make blatantly assertive statements that we know are absolutely off the wall”.

“It’s a change for the good, definitely. I think we’ve learned a lot more in these three weeks than we would have in the three weeks of normal school”.

Interestingly, they did find some aspects of the summer school less conducive to learning, and this was a result of interventions by one of the qualified teachers.. They felt that the teacher attempted to create conditions that were more like 'normal school', rather than the norm of the academic-led sessions on the summer school:

"I think it's [...] going downhill because we've, since the beginning of the second week we've had, em, and the structure is, we have the teacher there, who actually teaches us a lot, and we have someone who's been brought in who is a national Qualified Teacher from a school..."

"And, basically, she's kind of shutting off, because she's not actually teaching us anything ... she kind of, she puts us in a seating plan, or something like that, so it's kind of more like normal school".

"The seating plan was her idea".

"Yes, she's kind of made things more sterile".

"Yeah, and now she's made it more like school, it's awful".

"I think, yeah, we could probably have done better with the arrangement of the first week, if the atmosphere was slightly less rigid. It's not completely uptight, it's just we felt more at ease when the atmosphere was more relaxed".

Interestingly, when asked about her role, this teacher described it in terms that had a good deal to do with control:

"I think they've worked quite well, yeah. I've moved them round in different groups to avoid any sort of cliques kind of building in. And, yeah, in the same way as any other student, 'cos you might have to ask them to stop talking to listen to something, or to pick up a, you know, a bit of litter and put it in the bin, kind of thing, you know, as you would with any teenager. But they are, yeah, there are one or two maybe... attention might be wandering, but...absorbing everything really, so, I'm very pleased with their level of work".

There did, therefore, appear to be some divergence of opinion between the students and at least one of the qualified teachers on the nature of successful teaching and learning on a NAGTY summer school strand. In this context, it is perhaps relevant that this particular teacher did not have an academic background in law and may, therefore, have relied on generic school-teaching skills about classroom management as her contribution to the teaching team.

6.5 Application

Drawing on the case study of the Law and Legal Issues in Contemporary Society strand, delivered at the University of Warwick, a number of points that are of potential relevance to others, are summarised.

6.5.1 Potentially relevant to NAGTY teaching teams

Planning the strand

- build on experiences of previous NAGTY summer schools
- plan the strand around explicit underlying principles
 - for example, on the Law and Legal Issues in Contemporary Society strand, the principles underlying the planning were that the strand would have a unifying theme, would involve a 'hook' to appeal to school-age students, would be delivered in short sessions and would avoid using lectures
- plan an engaging, fun start to the course
 - for example, this strand began with a visit to Warwick Castle and used that as a starting point for discussion about feudal ties and medieval punishments
- plan the structure to build to a purposeful finale at the end of the course
 - for example, this strand finished with a videoed role play of a Court Hearing
- plan in one or two relevant off-site trips to provide variety and additional stimulation

Working as a teaching team

- interpret the NAGTY teaching team flexibly in order to create a teaching team that suits the host department and the people involved

- for example, on the Law and Legal Issues in Contemporary Society strand, the role of Lead Academic was shared by three members of the department, one for each week of the course, whilst two teachers shared the Qualified Teacher role
- if possibly, employ a Qualified Teacher with relevant subject knowledge so that the role involves contributing to the course content as well as to the classroom management side
- ensure clear communication amongst the team *prior* to the summer school and maintain open communication *during* the summer school

Teaching and learning

- use teaching methods that encourage and enable a high degree of interaction with and among the students - this encourages participation but also develops active listening skills
- provide opportunities to practice the key skills of the discipline being studied
 - for example, on this strand, students were practising putting forward their own arguments but also listening to the arguments of others, both key skills of a lawyer
- keep teaching sessions short and enjoyable
- be responsive to students' attention spans by changing pace and offering variety of topic and activity

6.5.2 Potentially relevant to teachers in schools

The Law strand qualified teacher interviewed highlighted some of the ways in which the teaching and learning on the NAGTY strand differed from normal classroom experience, in particular, that the summer school course provided the students with a lot of opportunity for:

- discussion
- sharing of ideas
- in-depth work on a topic of interest
- finding out about different career options arising from studying Law
- deciding whether Law was the right choice for their future career.

From the experience of teaching on the NAGTY summer school, the teacher hoped to take back to normal school:

- a raised awareness of the learning needs of Gifted and Talented students;
- an increased understanding of how to provide appropriate extension work for them through interactive work such as role play, discussions and conversations

7. THE UNIVERSITY OF WARWICK, DRAMA AND THEATRE

7.1 Introduction: setting the scene

In the drama strand session observed, there were 20 students present (13 girls and seven boys), along with the strand leader, the qualified teacher equivalent, and the teaching assistant. The session took place in a drama workshop room, which comfortably accommodated the group. The students sat in a circle, while the strand leader outlined the programme for the day.

Following the briefing, there was a 20 minute warm-up period when three students, in turn, ran exercises for the entire group. Each lead student organised and ran an activity, which the group entered into with enthusiasm. They were clearly familiar to this way of starting the day, and all the students were fully engaged.

The strand leader then quickly briefed the students on the next task, which was to continue their group work on the play they were preparing – *The Comedy of Errors*. The students spent ten minutes, in their groups, developing their ideas for acting scenes from the play. The staff circulated among the groups, listening to the students outlining their ideas. The students were all engaged in the task, all the students were included, and there was a good deal of discussion. The groups were then brought back together, and each group in turn explained their ideas, and directed the acting out of these ideas by the other students. The students were working autonomously, directing, explaining, and acting. The staff made only a few interventions, primarily to ask questions, or to seek clarification from the directing students. At the end of the session, the strand leader made concluding remarks, and finished with an encouraging assessment of the students' work.

7.2 Planning the strand

The drama strand had a new strand leader in 2005, although the other members of the teaching team had been involved in the previous presentations of the course. The strand leader was a freelance theatre director, and an Associate of the Royal Shakespeare Theatre Company's Learning Department. She had experience of running summer

schools before, but had not been involved with NAGTY. She attended a number of induction meetings, but found the most useful was a course leaders' meeting. Only at that point did she feel that she had a good grasp of the particular features of NAGTY and the NAGTY Summer Schools. This meeting enabled her to focus more clearly on the planning requirements for the strand, but the key was the contribution that was made by her two teaching colleagues:

“I’ve run masses of summer schools, but, you know, I think it is a very particular kind of fish, whatever you want to call it! [...] I was trying to get my head around how that would change or affect what I was going to do. And, actually, the information, the inductions I had from other people were less useful until I got to the way the people who had done it before. For example, my two colleagues, their perspective, obviously, was slightly different coming from their own take on it. And, actually, once I understood how the NAGTY structure works, as a whole, across the courses, it all became a lot more clear how much I’d take that into the, that particular dramatic medium, how we kind of do that”.

The strand leader was able to call upon the experience of one of the qualified teachers, who had previously taught on the drama strand, and had wide experience at university and further education level. He saw his role as providing advice on specific aspects of strand planning and implementation, and noted that each team member made different contributions to the strand, which involved some negotiation:

“We all had plenty of things [to contribute to the planning], all three of us [...]. It took a bit of [negotiation] because with three of us, we want the same thing, but, [...] all three of us contributed to the planning of it. My role is the education one; [...] that’s my contribution”.

The strand leader felt that the particular demands of the NAGTY Summer School meant that planning was more demanding than for other drama summer schools she had worked upon. She argued that the NAGTY Summer School required a more detailed and in-depth, more academic, approach to course planning. These requirements arose, in her view, from the ‘gifted and talented’ nature of the students, and were in addition to the normal workload of a drama summer school. Planning was built around this approach,

and required a degree of 'just in time' planning, something that the strand leader felt that she would try to reduce in future years:

“Especially in the first week, it was very, very, very full on, because the nature of how, the nature of really how theatre works, is that you need a lot of the kind of the real input, the kind of groundwork to be there at the beginning of the process, for the kind of, so that what grows out of it, you know, is coming from a really solid base, so they understand, you know, the background of the play, the influences, the kind of history that surrounded that, the kind of the styles that might be used. You know, more understanding of areas of the text that we know nothing about today, like attitudes to madness, or whatever, you know, all of these things. [...] So I did find, the first week I found that I was sort of rushing home, doing loads, to come back the next day. I think, I think, having a clear understanding of what I've got to do, but I think if actually I did it again next year, I'd think I would probably be able to be a bit more prepared about that in advance, it was just, it was sort of more, more intense than somehow than I anticipated that. [...] Obviously, I think, I think, you know, the academic kind of element to this is much more, I'm giving them much more what I would give when working with a professional cast, it's much, it's much higher a level than other summer schools that I do because I'm trying to give them an all round perspective. [...] So, it's, there's definitely a higher level”.

7.3 Working as a teaching team

The two team members who were interviewed (the strand leader, and one of the qualified teachers) were clear that the subject required, to some extent, a different approach than required for other strands being offered on the Summer School. For example, the three permanent team members were all practitioners and educators, with a background in directing. However, there was, from the strand leader's standpoint, an issue about the exact makeup of the team. While she was clear that team members should have combined practitioner-educator backgrounds, she also felt that she might have chosen, to some extent, a different team if she had been given that opportunity. However, she was only given the option of choosing an entirely new team, something which she felt would have been inappropriate. The central problem was that one of the

team members was not present throughout the three weeks. Had she been so, then there would have been more support for daily activities.

The strand leader felt that the team's strengths were built around the combined practitioner-educator experience:

“The benefits are that I think it's a very experienced bunch, you know, they're very experienced, both as educators and as practitioners, and I think the balance of that is really good, is really good. I don't know that there would be any advantage, you know, of having someone who was just an educator and never had the practice [...] Because it does help us I think [...] they [educators] tend to be very good at talking about it, writing about it, but, actually, practically doing it, sometimes, is hard, so actually the more you've got people who know how to, how to kind of get them into action, the better [...] And I think between the three of us we actually touch on a very wide, very wide, a very broad range, across our field”.

This 'broad range' of experience was enhanced by the addition of particular specialists, who were brought in to give workshops on various aspects of theatre. The qualified teacher explained:

“And you look at the play, at the techniques to do it. Obviously, the comedy in this case, ok, so we had a workshop with stage fight, with a clowning workshop, we had a voice workshop with the RSC, we talked to the designer, so you actually, what you do for them, you actually ferment the play, the big Shakespeare, into a manageable, you know, 'Ah, I can do this, I can do this'”.

The qualified teacher also talked about the working relationship that he had with the strand leader, focusing on the freedom that existed to intervene:

“There's no border that I cannot cross. We met first time, we established the fact that [she] is the leader from an artistic point of view, [name] is co-directing with her, ok, and I'm the bully [laughing]. That's how we establish it. Mainly, I'm trying, what I'm doing in terms of noticing, I'm doing for the last three years [on the

NAGTY Summer School] is I'm identifying strengths and weaknesses with students, ok? [...] So, given more time to observe and, then, I go to them [the students] individually, without making too much fuss, a line they're struggling with, you know, a concept they can't understand, you know, something, just one to one, and then I give them more time to be more individually, you know, more encouraging".

7.4 Teaching and learning

For the strand leader, the most notable aspect of the teaching and learning experience of the drama strand was the degree to which the students took responsibility for learning. The strand leader felt that the students were, in her experience, an unusually able group, and that, in consequence, she, and the teaching team, were able to benefit from their capacity to learn. Talking about the students, she characterised them as follows:

"They absolutely astonish me in their thinking and their responses. I would say, first of all, it's very mature for their age [...] if you're saying what the general impression is. But they're very mature for their age in their thinking, so some are very kind of, almost, are sort of philosophical, if you like, understanding of themes, when we're talking about themes, and, you know, life, is quite, is quite deep and mature. So, I think that, that kind of angle, but also their response to, I mean, I'm much more stressed when I'm working with [other] students, I'm much more aware of having to supply more of the creative thinking, more of the kind of, you know, just to, you're just all the time sort of pushing more, but, actually, it's been lovely to just have much more coming from them, so that you're not having to kind of dredge it out, you know."

The fact that the strand leader found the students to be forthcoming, engaged, and able, allowed the teaching team to develop the theatre aspects of the course more quickly. She realised from the outset that there was more scope for teaching, and learning, with the NAGTY group than with other groups that she had worked with:

"I just enjoy being with such a creative, you know, intelligent bunch, which, you know, you just don't get that kind of, you know, well, yes, it's very rare to actually

have that many, and, therefore, not having half the group sort of slugging off the others [...] Everybody is applied to the task and doing it, and keeping at it, and carrying on working, rather than picking up the tail end, and not being able to complete something because there's not enough response".

The implications were that the teaching options were broadened, and progress was both deeper and quicker than she had anticipated. The strand leader gave one example of this, talking about her use of language with the NAGTY students, and other summer school students:

"I probably have upped the sort of standard of it to more, as I say, like running a professional rehearsal, more, obviously, never entirely, but it's closer to that because it just feels like they have got enough of a grasp. They haven't necessarily got the full-on talent [...] but they've got so much more of a grasp on what we're doing, so it's possible to do that. So, I think that is true. I haven't worried about the language I use so much. You know, usually when I'm working with groups of students I never, I never like moderating my vocabulary massively, dumbing it down, but I often explain things in more than one way to make sure that everybody, you know – I've done that far less this time, because, in response to hearing them talk, and the kind of vocabulary they're using, that I think, on the whole, they will understand what I'm saying".

7.5 Application

Drawing on the case study of the Drama and Theatre strand, delivered at the University of Warwick, a number of points that are of potential relevance to others, are summarised.

7.5.1 Potentially relevant to NAGTY teaching teams

Planning the strand

- make use of the course leaders' meetings prior to the summer school to plan the strand in the context of its place in the overall summer school

- involve all members of the teaching team in planning the course
- prepare the academic side of the course in advance and pitch it to a sufficiently high standard to meet the needs of Gifted and Talented students
 - for example, on this Drama and Theatre strand, a high level of preparation was required to provide the students with sufficiently academic, in-depth accounts of the background to the play, the acting styles used at the time it was written, the historical context *et cetera*

Working as a teaching team

- draw together people with relevant experience to create a suitable teaching team
- build on previous experience of NAGTY summer schools
- meet together as a teaching team prior to the summer school to plan the course and to agree on respective roles
- use the range of skills and experience represented in the teaching team and draw on the strengths of each member
- enrich the core teaching team by inviting specialists to give workshops
 - for example, on this Drama and Theatre strand, specialists were invited in to give workshops on stage fighting, on clowning, on voice, on stage design
- use the Qualified Teacher role to observe the strengths and weaknesses of individual students not only for the purposes of assessment and reporting but also to offer appropriate one-to-one support and conversation

Teaching and learning

- provide the students with opportunities to put their learning into practice
 - for example, on this Drama and Theatre strand, the students were working towards a final production of a play
- use the specialist vocabulary appropriate to the discipline being studied
- enable the students to take responsibility for their learning

7.5.2 Potentially relevant to teachers in schools

The Qualified Teacher interviewed highlighted the following points as applicable to teaching drama to Gifted and Talented students outside the NAGTY summer school context:

- be continually responsive to the students in terms of when to ask for more from them, when to relax
- place more emphasis on being a facilitator of the students' learning - *"teach how to learn", "encourage them to find the pleasure in learning"*
- allow the students to take responsibility for their own performance; remind them from the start that on the day of the performance they will be on stage without their teacher

CONCLUSIONS: “You’re actually having a conversation with them”.

A number of common themes emerged from the examination of the seven exemplar strands. Although the strands covered a wide range of disciplines, the adults and students involved gave a broadly similar account of what they felt was good practice at the NAGTY summer school.

Planning the strands

In terms of planning, a number of salient points emerged:

- More material than will be utilised should be prepared, as there is a need to provide students with choice, variety, and options. This is particularly the case if, as most of the exemplar strands did, the strand planners wish to stress student-led learning.
- Teaching teams should be prepared to be flexible in terms of delivery and content.
- The physical environment should be conducive to teaching and learning.
- The strand should be well resourced.

Working as a teaching team

- There should be clearly assigned roles for each member of a teaching team, based on the particular strengths and experience of individual team members.
- Continuity from one year to the next is greatly valued. This can be ensured by recruiting the same teaching team and/or building a course on previous presentations.

Teaching and learning

- The aim should be to focus on learning by the students, more than teaching by the teaching team.

- The atmosphere created in the classes was important. A relaxed, happy, relatively rule-free environment was most beneficial in terms of teaching and learning. Students were happier when the experience was not like that at school.
- In terms of content, and activity, variety was seen, by all strand participants as being essential.
- The students valued interactive, hands-on learning. They also felt that discussion-based activities with their strand peers were very profitable.
- Intellectual freedom and freedom of choice were seen to be exciting, and beneficial, by the students.
- Students enjoyed having two-way conversations with the teaching staff, but disliked formal lectures.
- Students preferred to work in small groups on practical tasks, rather than as individuals on worksheets.
- Learning skills, and ways of thinking appropriate to the academic discipline being studied, were seen to be more important than subject content *per se* by both teachers and students.
- To accommodate the range of interests among the students, subject content needed to provide the potential both for in-depth study and for a broader survey across the topic area.
- Enjoyment was seen to be essential to effective learning.

For the large majority of the student interviewees from the seven strands, their experience of teaching and learning at the NAGTY Summer Schools was an exciting, and profitable, time. It was normal for the students to have reflected on their experiences, and, as in the case of the Warwick University law strand, the students offered sophisticated analyses of the conditions that supported effective teaching and learning. As one of them commented:

“Like I said, I think in normal schooling [...], the class don’t really have discussions, as such. You are lectured at, the teacher talks. I probably would refer to it as being taught, not being taught *to*, but being taught *at*, whereas here, you’re actually having a conversation with them”.