Questioning styles: observations of differences in practice at key stage 2 and key stage 3

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Questioning Styles: Observations of Differences in Practice at Key Stage 2 and Key Stage 3
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Abstract
This small-scale school-based research funded through the Best Practice Research Scholarship (BPRS) considers the different questioning styles used by teachers at Key Stage 2 (KS2) and Key Stage 3 (KS3). This research topic was selected because of perceived differences in the creativity seen in children’s work at the beginning and end of KS3. A literature search indicated that the use of open-ended questions was a recognised strategy that could be used by teachers to promote creativity in children. The research strategy adopted therefore set out to establish the possible nature of any differences in the classroom questioning strategies adopted by KS2 teachers and KS3 teachers and also to observe any other apparent differences in the teaching and learning approaches. The research evidence established that KS3 teachers do use more closed questions and suggests the need for detailed research concerning the impact this might have on pupils’ project outcomes. A discussion of the possible links between questioning techniques and the creativity of the pupils’ projects is included.

Key words: Open questions, closed questions, teaching strategies, Key Stage 2, Key Stage 3, creativity.

Introduction
Curriculum 2000 for design and technology calls for ‘pupils to become autonomous and creative problem solvers, as individuals and members of a team’. From my teaching experience pupils arrive from KS2 into KS3 with a greater capacity for creating innovative products than when they leave KS3. This seems to be a perception shared by many teachers and commentators on education. The focus of this research was to compare classroom teaching strategies, particularly teacher questioning techniques, at KS2 and KS3, and to begin to understand any relationships there might be between these and the creativity observed in pupils’ project outcomes.

Why is creativity so important? Who thinks it is important?
Increasingly the national curriculum for England and Wales is seen as providing a narrow, subject bound education; even though ‘subjects’ such as citizenship have been introduced into the national curriculum and exam results continue to rise (Ofsted, 2002) there is a concern that children are not leaving the education system with skills necessary for the workplace (DfES, 2001). Both QCA and DfES see thinking skills, creativity and independent learning as being important to the education of children; these organisations have recognised that the national curriculum does not firmly promote these attributes. Creativity is seen as important in developing the personal traits and characteristics necessary for a person to play a successful and valuable part of society (Cropley, 2001).

A key text which reflects on the need for a broad, flexible and motivating curriculum is the National Advisory Committee on Creativity and Cultural Education (NACCCE, 1999) report All our Futures: Creativity, Culture and Education. Its central element is the recognition for a national strategy of creative and cultural education which promotes and unlocks the creative potential of every young person. Design and technology, by definition of the national curriculum, is a subject that upholds the importance of creativity in a child’s development.

NACCCE and Cropley write about ‘fostering’, ‘encouraging’ and ‘teaching for creativity’, there is clearly an assumption that creativity is not taught as a subject matter but encouraged as an attribute.

How can creativity be encouraged in children?
What strategies should be used to foster creativity?
The role of the teacher is seen as crucial to fostering creativity (NACCCE, Cropley, QCA, Barlex (2000)). When questioning a child about their work Cropley encourages avoiding ‘suggestive’ questions or those that require a ‘yes’ or ‘no’ answer whilst the NACCCE report discusses the use of open and closed questions used by creative teachers (NACCCE: 95). Ofsted state in their annual report (2001) that there continues to be little progress by children from the end of Year 6 to the end of Year 7:

‘there is evidence to suggest that ‘secondary schools … are not yet building well enough on pupils’ prior attainment (in primary school).’

Further comment suggests the motivation of pupils tailing away during Years 8 and 9 after their initial enthusiasm of arriving at secondary school in Year 7.
One of the reasons put forward by Lenga and Ogden (2000) for this drop in attainment are teaching and learning issues. Evidence implies that teaching and learning approaches at KS3 do not reflect progression from KS2 (ibid, 2000). This may be caused by a lack of awareness of what is happening at KS2 by KS3 teachers and also a scepticism from KS3 teachers that they have anything to learn from KS2 teachers.

Secondary school teachers need to understand the pedagogy used at KS2 in order to smooth the transition to KS3, and to endeavour to avoid any dip in performance associated with the transition. These issues are currently being addressed by the National KS3 strategy and one of its four key principles is to ‘strengthening the transition from Key Stage 2 to Key Stage 3 and ensuring progression in teaching and learning across Key Stage 3’ (DfES, 2002).

Methodology
From the review of the literature review, it was clear that a potentially important teaching strategy that could be observed in KS2 and KS3 lessons was the use of open and closed questions in a design activity. Consequently, questioning events were investigated in four lessons (2 KS2 and 2 KS3), recording the frequency and type of questions asked, focusing on four variations of questions:

- SO – open subject
- SC – closed subject
- GO – open general
- GC – closed general

<table>
<thead>
<tr>
<th>KS2 A</th>
<th>Wednesday 26th June 2002</th>
<th>Time</th>
<th>SO</th>
<th>SC</th>
<th>GO</th>
<th>GC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2 5 0 0</td>
<td>0.02</td>
<td>0.04</td>
<td>0.06</td>
<td>0.08</td>
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</table>

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<th>Wednesday 26th June 2002</th>
<th>Time</th>
<th>SO</th>
<th>SC</th>
<th>GO</th>
<th>GC</th>
</tr>
</thead>
<tbody>
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<td>2 5 0 0</td>
<td>0.02</td>
<td>0.04</td>
<td>0.06</td>
<td>0.08</td>
<td>0.1 0.12 0.14 0.16 0.18 0.2 0.22 0.24 0.26 0.28 0.3 0.32 0.34 0.36 0.38 0.4 0.42 0.44 0.46 0.48 0.5 0.52 0.54 0.56 0.58 1.02</td>
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<td>2 0</td>
<td>0 0</td>
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<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KS3 A</th>
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<th>Time</th>
<th>SO</th>
<th>SC</th>
<th>GO</th>
<th>GC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2 5 0 0</td>
<td>0.02</td>
<td>0.04</td>
<td>0.06</td>
<td>0.08</td>
<td>0.1 0.12 0.14 0.16 0.18 0.2 0.22 0.24 0.26 0.28 0.3 0.32 0.34 0.36 0.38 0.4 0.42 0.44 0.46 0.48 0.5 0.52 0.54 0.56 0.58 1.02</td>
</tr>
<tr>
<td>2002</td>
<td></td>
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<td>2 0</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KS3 B</th>
<th>Monday 8th July 2002</th>
<th>Time</th>
<th>SO</th>
<th>SC</th>
<th>GO</th>
<th>GC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2 5 0 0</td>
<td>0.02</td>
<td>0.04</td>
<td>0.06</td>
<td>0.08</td>
<td>0.1 0.12 0.14 0.16 0.18 0.2 0.22 0.24 0.26 0.28 0.3 0.32 0.34 0.36 0.38 0.4 0.42 0.44 0.46 0.48 0.5 0.52 0.54 0.56 0.58 1.02</td>
</tr>
<tr>
<td>2002</td>
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<td>0 0</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
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</tbody>
</table>

**Figure 1:** The record of the four lessons observed
Both general and subject specific questions were observed to look at the ratio of subject related questions to general questions in order to see if there were any significant differences between KS2 and KS3 lessons. Ofsted (2001) points out the decrease in motivation and behaviour falling away in Year 8 and 9; one of the purposes of general questions in a lesson is to challenge behaviour and children stray from their work.

Four lessons with different teachers were observed:

<table>
<thead>
<tr>
<th>Code</th>
<th>Key Stage</th>
<th>Year group</th>
<th>Teacher</th>
<th>Content of lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>KS2 A</td>
<td>2</td>
<td>5/6</td>
<td>1</td>
<td>Developing their designs for a garden.</td>
</tr>
<tr>
<td>KS2 B</td>
<td>2</td>
<td>5/6</td>
<td>2</td>
<td>Learning about scale.</td>
</tr>
<tr>
<td>KS3 A</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>Developing bag designs and logos.</td>
</tr>
<tr>
<td>KS3 B</td>
<td>3</td>
<td>7</td>
<td>4</td>
<td>Manufacturing bags and designing the manufacture of the logos.</td>
</tr>
</tbody>
</table>

Figure 3: Teachers 1, 2 and 4 were interviewed. The KS2 teachers were interviewed together.

Method of selection of sample
This research has been funded by a best research practice (BPRS) grant; as part of the application for funding one of the stated aims to help raise standards was to be achieved by easing the transition from KS2 to KS3 in my locality. Therefore the secondary and primary schools are in the same town in Lincolnshire.

At the primary school the classes are taught as mixed year groups (Year 5 and 6) and divided into ability. KS2 A (see codes in Figure 3) was of lower ability than group KS2 B. Both KS3 groups were of Year 7 mixed ability. The decision to observe these year groups was due to the background reading giving evidence for the transitional dip between the end of Year 6 and a year later in Year 7 (Ofsted, 2001).

The four lessons watched were part of larger projects:
KS2 A  Pupils were working individually on designs for a garden, once the designs were finalised they were modelled in shoeboxes. The finished products were exhibited in the local church. In the lesson observed the objectives were to use a range of sources to find inspiration for different features that could be in the garden and to draw accurate ideas for their garden on paper.

KS2 B: These pupils were doing the same project as those in KS2 A. The lesson observed was a very focused and teacher led task where the pupils were learning about scale with the aim that the following lesson they would be able to produce a scale drawing of their chosen garden design. The lesson involved the class going outside with trundle wheels to draw full size gardens on the playground.

KS3 A The group were involved in a textiles project called ‘Carrying’ where they developed their own designs for a carrying device. The finished product had to be decorated with a motif or logo designed by the pupil. The techniques for producing the logo were varied. During this lesson the pupils were individually planning the manufacture of their products by producing patterns and testing small parts of their designs. They were also involved in experimenting with possible methods of producing the logo.

KS3 B: These pupils were doing the same project as those in KS3 A.

Figure 4

The data collected shown in Figure 5 grouping the questions into four equal time slots did make analysis easier, it also allowed for the fact that the lessons were of different lengths. Aggregating the scores into three periods fits with the KS3 strategy format of the three part lesson.

<table>
<thead>
<tr>
<th>Period 1</th>
<th>First 25% of the lesson</th>
<th>Introduction to the lesson/ topic/ activity.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period 2</td>
<td>Middle 50% of the lesson</td>
<td>Activity/ individual work/ learning a new process.</td>
</tr>
<tr>
<td>Period 3</td>
<td>Last 25% of the lesson</td>
<td>Plenary/ tidy up.</td>
</tr>
</tbody>
</table>

Figure 5

The lessons observed did fit this pattern with questions asked at the beginning to refresh the pupils about the last lesson and set the context for this lesson, questions in the middle to individuals to clarify what they were doing, encourage them to think and for the teacher to make sure they understood what they were doing and the last period included questions to recap the lesson, share some good ideas and make sure that the pupils could fit the lesson into the whole context of the project. The results for the timing of the questions have been grouped into three periods.
Results

Figure 6: The ratio between the use of open and closed subject based questions

<table>
<thead>
<tr>
<th></th>
<th>KS2 A</th>
<th>KS2 B</th>
<th>KS3 A</th>
<th>KS3 B</th>
</tr>
</thead>
<tbody>
<tr>
<td>GC</td>
<td>34.1</td>
<td>8.7</td>
<td>33.3</td>
<td>28.8</td>
</tr>
<tr>
<td>GC</td>
<td>1.6</td>
<td>0.0</td>
<td>0.0</td>
<td>3.5</td>
</tr>
<tr>
<td>SC</td>
<td>46.0</td>
<td>78.3</td>
<td>60.5</td>
<td>51.4</td>
</tr>
<tr>
<td>SC</td>
<td>18.3</td>
<td>13.0</td>
<td>6.2</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Figure 6 displays the percentage of the different types of questions used in each of the lessons; it highlights the dominant use of SC questions by the four teachers observed compared to the other three types of questions (on average 62% of the questions asked were SC). The average of GO questions was only 1.3%. GO questions only feature in lessons KS2 A and KS3 B with the three GO questions being used to draw a child or group of children back to the task, e.g. ‘How are we doing?’.

General closed (GC) questions tended to be directed only at one child and generally used for the same purpose as GO questions, for example, teacher 1 spent time with a child who was having difficulty with the task using questions to draw out of the child why they were unable to work.

Figure 7 draws attention to the higher use of subject based questions compared to general questions by all teachers. This is an encouraging fact: most conversation and questioning that took place in the lessons were based around the learning topic. Asking pupils to explain what they are doing with regards to their work was used in preference to highlighting them being off task (e.g. ‘What have you done so far?’ as opposed to ‘Why are you wandering around?’).
**Figure 7: Ratio of subject to general questions**

<table>
<thead>
<tr>
<th></th>
<th>KS2 A</th>
<th>KS2 B</th>
<th>KS3 A</th>
<th>KS3 B</th>
</tr>
</thead>
<tbody>
<tr>
<td>General questions</td>
<td>36</td>
<td>9</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Subject questions</td>
<td>64</td>
<td>91</td>
<td>67</td>
<td>67</td>
</tr>
</tbody>
</table>

**Figure 8: Ratio of subject open versus subject closed for all lessons**

<table>
<thead>
<tr>
<th></th>
<th>KS2 A</th>
<th>KS2 B</th>
<th>KS3 A</th>
<th>KS3 B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject closed</td>
<td>72</td>
<td>86</td>
<td>91</td>
<td>92</td>
</tr>
<tr>
<td>Subject open</td>
<td>28</td>
<td>14</td>
<td>9</td>
<td>8</td>
</tr>
</tbody>
</table>
SO questions are used more in KS2 lessons than in KS3 lessons (figure 8). Even in the KS2 lesson where the objective of the lesson was to teach a new technique to the class and so by its nature tended to lend itself more to SC questions the percentage of SO questions was still higher than both of the KS3 lessons where pupils were engaged in more open-ended tasks.

The frequency of open and closed questions in a lesson

There was a noticeable increase in the use of SO and SC questions in the middle of the lessons when, with the exception of lesson KS2 B, the pupils were engaged in individual activities (figures 9 and 10).

Figure 9: Frequency of SO questions across all lessons

The teacher in lesson KS2 A was the only teacher to use SO questions in the third period of the lesson. For KS2 A lesson the SC questions dipped in period 2 of the lesson whilst the GC questions peaked. The opposite was true for KS3 A lesson.

Figure 10: Frequency of SC questions across all lessons
Interviewing
The purpose of the interviews was to glean from the teachers other strategies they used to foster creativity. Whilst this did not focus on the use of questions in lessons, I felt that it was an opportunity to explore how teachers encouraged students to be creative.

The first question asked: when you set a new design task to a group what do you do to encourage them to be creative? The two KS2 teachers mentioned, amongst other things:

- Encourage originality;
- Share things with the whole group from individuals;
- Seeing things that inspire.

The KS2 A lesson used some of these techniques and the examples of questions given above exemplify this. Both KS2 teachers also used positive language throughout the lesson, encouraging the children:

- ‘So it’s different? It’s unique?’
- ‘Fantastic! That’s good.’
- ‘It’s not a silly idea’.

The last question is an example from the list drawn out from the list of common factors: value and respond to unexpected outcomes.

The KS3 teacher focused more on looking at existing products for inspiration and the work of others; using language to encourage was not mentioned at all.

The second question asked the reverse: what hinders or stops creativity? All three teachers commented on the use of negative language:

- ‘Me telling them it’s not possible’; (KS3 teacher)
- ‘Negative comments towards behaviour rather than comments about their work’. (KS2 teacher)

The final question was about ability and whether more able children tended to be more creative:

- ‘Presentation is better.’ (KS2 teacher)
- ‘Actual content isn’t different.’ (KS2 teacher)
- ‘More able can be more creative.’ (KS3 teacher)

The KS3 teacher turned the question around and considered the less able and their creativeness:

- Less able tend to copy existing designs.
- Less able want to make ambitious designs.

Analysis and discussion
There are a range of techniques available for a teacher to use when fostering creativity in lessons, and the observations focused on one of these techniques: the use of open and closed questions. Looking at figures 7 and 9 there is evidence that teachers in KS2 lessons used more open-ended questions than the teachers at the secondary schools. From the interviewing it became apparent that whilst teachers from both key stages emphasise the quality of outcomes and presentation, KS3 teachers in their use of language place a greater importance on the quality of the work produced (‘You sewed absolutely perfectly then Liam?’ KS3 teacher).

Referring back to the introduction, the four teachers observed did dip into the strategies listed in the lessons:

- Encouraging students to learn independently and with autonomy.
- Being free from giving immediate criticism.
- Valuing and responding to unexpected outcomes.
- Suggesting ways forward (e.g. ‘What if …?’).

Useful further research could look at the use of positive comments given in response to pupils design work. More generally it is clear from the literature mentioned that the use of language by a teacher can foster or inhibit creativity, therefore more investigation needs to be done into how language is used, its effect on creativity, recommended ways of encouraging creativity through conversation and how to transfer these findings to teachers.
When considering why KS2 teachers use more open-ended questions in their teaching some possible answers suggest themselves.

The background of the two KS2 teachers I observed and interviewed was not originally in design and technology, however for the KS3 teachers design and technology was the only subject they taught. As a result:

- Were the KS2 teachers less likely to steer their pupils towards answers because they set out on the project journey with no fixed preconception of where it might end? This may mean that they are more comfortable with asking ‘What if…?’ than KS3 teachers.
- Or is it because of this uncertainty they automatically ask open questions to see whether the pupils will lead the lesson/project into the ‘right’ direction?

Are primary school teachers more responsive to what the children are thinking and the creativeness or openness of their minds than secondary teachers because of the nature of end of key stage assessments? At KS2 English, maths and science levels are given greatest credence so for a teacher who is delivering all of the National Curriculum subjects these three core subjects are delivered ‘safely’ whilst design and technology is taught with risk taking. Whereas for KS3 the teachers are held responsible for one subject and judged on those results therefore causing the teacher to play safe and avoid the risks that creativity can bring with it.

With reference to this last point further research could consider the impact of the language used regarding creativity (if there is any) in the level descriptors and how this impedes the desire of teachers to encourage more risk taking and creativeness.

Also a clearer understanding of what constitutes an open-ended question is needed. It is easy to suppose that closed questions are ones that have either an expected answer or only need a yes or no but having completed the research and gone back to review the notes I made I question whether it is as clear cut as this.

Conclusions
There is evidence to suggest that KS3 teachers use more closed questions than open questions along with a greater emphasis on presentation compared to KS2 teachers. It is possible that this change in the use of questions by teachers might affect the pupils’ transition from KS2 to KS3 and, consequently, this is an important area for future research, both for this reason and any effects it might have on the creativity embodied in pupils’ project outcomes.

References
Barlex, D, (2000), Creativity in Art and Design and Design and Technology, Nuffield and QCA.
National Advisory Committee on Creative and Cultural Education (NACCCE), (1999), All Our Futures: Creativity, Culture and Education, DfEE: London