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Arts Across the Curriculum: Enhancing Pupil Learning
The Pupil Perspective

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Abstract

This paper reports on pupil findings from a 2 year evaluation study of a programme designed to integrate arts and the school curriculum.

The Scottish Arts Council and 7 Scottish local authorities, with funding from the Scottish Government, introduced 'Arts Across the Curriculum' (AAC), a 3 year development programme with wide-ranging aims including increasing pupils' achievement and motivation, developing teachers' skills of working collaboratively and creatively, erosion of subject barriers and improving school ethos. AAC follows the approach of the Chicago Arts Partnerships in Education (CAPE). At the heart of AAC is the 'integrated curricular lesson' (ICL) that arts professionals and teachers plan and deliver together. The purpose of the ICL is to enhance pupils' understanding of curriculum content through arts activity and for pupils to gain greater insight into the arts.

The research questions were informed by literature relating to the effects of arts in education and arts-curricular integration in particular (e.g. Comerford Boyes & Reid, 2005; Harland et al, 2005; Upitis & Smithrin, 2003).   In broad terms, the questions related to the pupils' perceptions of what they were learning during ICLs, the extent to which they thought these lessons helped them learn better and how they explained their learning; the extent to which they found the lessons interesting, enjoyable and engaging; the opportunities the ICLs provided for encouraging creative approaches, collaborative learning and developing confidence.

The findings are interpreted in the light of findings from similar interventions (e.g. Catterall & Waldorf, 1999; Cochrane and & Crockett, 2007; DeMoss & Morris, 2002; Eisner, 2004; Tishman & Palmer, 2006; Upitis & Smithrin, 2003; Winner & Hetland, 2000). Explanations of what contributed to the success of ICLs in enhancing learning are considered in relation to constructivist learning approaches which emphasise pupil responsibility, approaching learning through addressing problems/real-life issues, constructive dialogue and questioning, and making thinking skills explicit (Brophy, 2002).

Introduction

The Arts Across the Curriculum Initiative

Arts Across the Curriculum (AAC) was a three-year pilot project sponsored by the former Scottish Executive's (now The Scottish Government) Future Learning and Teaching (FLaT) programme, The Scottish Arts Council, and the seven local authorities in which the initiative was piloted and evaluated.   In order to be eligible to participate in AAC, local authorities had to have a Creative Links Officer (CLO) in post. The seven CLOs were responsible for the management of the AAC programme in their local authority. The six key aims of the project were to:

1. increase pupils' achievement, particularly in understanding, in identified subject areas across the curriculum
2. increase pupils' motivation to learn
3. support and develop the skills of teachers to work collaboratively and creatively
4. encourage links between different areas of learning and erode subject barriers
5. improve the ethos of the school
6. explore the efficacy of the expressive arts as a delivery mechanism across the curriculum.

The ideas expressed in the project aims are drawn mainly from the Lakeside Education and Arts Partnership (LEAP) approach and their Arts Impacting Achievement (AIA) project.   These follow the Chicago Arts Partnerships in Education (CAPE) approach, commonly known as the 'Chicago model' (Catterall and Waldorf, 1999; http://www.capeweb.org/).

At the centre of both the Chicago and the Scottish variants is the 'integrated curricular lesson' (ICL), which arts professionals and teachers plan and deliver together.   In the AAC project, the schools, artists and structure of ICLs were chosen by the CLOs. The purpose of the ICL is to enhance pupils' understanding of curriculum content through arts activity and for teachers and pupils to gain greater insight into the arts.   Artist and teacher integrate their specialist knowledge in designing lessons to achieve this end.

The Evaluation

The Faculty of Education of the University of Strathclyde was commissioned to undertake the evaluation of the project, with the following aims:

1   Describe the extent to which the six key aims of the Arts Across the Curriculum (AAC) project (outlined above) have been met and in terms of other benefits that might emerge from the evaluation.
2   Identify strengths and any gaps in the training and support available to teachers and artists involved in the Arts Across the Curriculum project in the participating schools
3   Assess the overall impact of the Arts Across the Curriculum project on teachers, artists and pupils in the participating schools (including any gender differences in relation to outcomes)
4   Explore how the expressive arts can be used as a vehicle for carrying current school curriculum knowledge and for achieving broader educational targets
5   Establish conditions that support effective implementation and embedding of the Arts Across the Curriculum project.

Both the AAC project and the evaluation had ambitious sets of aims.   This paper, after briefly considering the wider context of arts in education and the concept of 'arts-integration', focuses on the pupil perspective, particularly in relation to the learning experience, learning and motivation.

Context

The AAC project sits in the context of an extensive and longstanding debate about the value and role of arts in education.   At a global level, the UNESCO World Conference on Arts Education (2006) produced a *Road Map for Arts Education: Building Creative Capacities for the 21st Century.*   The document aims to promote a 'common understanding of the importance of Arts Education and its essential role in improving the quality of education as a whole' (p1).   It endorses two main approaches: arts taught as individual subjects in their own right and what they call 'Arts in Education', i.e. as a medium for teaching and increasing the understanding of curricular subjects (p6).   The *Road Map* makes many claims for the benefits of arts in social, cultural and educational terms; in relation to the final point, the claims are for cognitive and creative development and enhancing the relevance of learning to the individual.

Comerford Boyes and Reid (2005), in a review of literature, note that most advocacy and research evidence literature emanates from North America and the United Kingdom.   The UK and North American

perspectives are acknowledged as being different in that the UK has had a longstanding commitment to arts in schools not found in general across North American education (Cochrane & Cockett, 2007). A recent North American review by Burnaford (2007) emphasises different perspectives on art-integration including learning 'through and with the arts', curricular connections or inter-disciplinarity, and collaborative engagements with specialists in different disciplines working together and engaging others (pupils, parents and community) in their collaborative projects. Claims for the benefits of engaging in arts education and integrating arts in the curriculum include: developing qualitative and flexible forms of thinking (Eisner, 2004), cognitive functioning and affective development (Catterall, 2002) and cognitive, personal and social skills (Comerford Boyes & Reid, 2005). THE WAY IN WHICH THESE BENEFITS ARE DESCONSTRUCTED (conceptualised?) VARIES ACROSS STUDIES. In the present study the way in which 'creative approaches' are operationalised is explained in the sections which report and discuss the findings.

These claims are in line with the aims of the AAC project and issues explored as part of the evaluation: namely, increasing achievement and understanding, raising motivation, developing collaborative and creative skills and aspects of pupil personal development such as esteem and confidence.

The Research

The research questions

In developing the research questions and operationalising them for the research instruments, cognisance was taken not only of the aims of the AAC initiative but also of issues emerging from research and evaluation previously undertaken in relation to the arts in education, in particular the work by Doherty and Harland (2001) and Harland et al (2005). A wide range of issues was identified; the following factors relate specifically to the pupil perspective:

1 the effective targeting of the creative activities (matching the skills available to pupils' abilities, resources, time constraints)
2 the role of the teacher during the intervention, when the artist is present and in preparation for the joint lessons
3 the artist's pedagogy: this was one of most important factors affecting pupil outcomes e.g. the quality of the artist's explanations and feedback, the use of resources, the provision of opportunities for creativity, pupil ownership of activities and the artist's flexibility to pupil needs
4 claimed outcomes for pupils: there is a major emphasis on enjoyment and a sense of achievement. There are claims that it should enhance pupils' interest and engagement in the topics to be learned and in the learning process. Analyses focus on the development of creativity, thinking and problem-solving skills, communication skills and skills for working collaboratively. Further claimed outcomes for pupils are enhanced self-esteem and increased confidence. (Upitis & Smithrin, 2003; Harland *et al*, 2000 and 2005; and Orfali, 2004).

The questions for pupils were derived from these issues. In broad terms, they were:
1 What were the pupils' perceptions of what they were learning during ICLs?
2 To what extent did they perceive that these lessons helped them learn better?
3 How did they explain their learning in these lessons?
4 To what extent did they find the learning tasks in these lessons interesting, enjoyable and engaging?
5 To what extent did the learning tasks encourage creative approaches, thinking skills and collaborative working?
6 To what extent did involvement in the project enhance confidence and self-esteem?

Research Methods

The research involved pupil, teacher and artist surveys; pupil focus groups and teacher and artist

interviews; classroom observations; and an 'in-depth' study in 3 associated schools of the process and practices in implementing ICLs.   Details of the survey responses and interviews undertaken in relation to all participants are given in an annexe to this paper.   Additionally, a small sample of AAC pupils and a comparator group of non-AAC pupils completed a set of standardised creative thinking skills tasks on two occasions (early in the intervention and towards the end of the pupils' participation in the initiative).

Over the 2 years of the evaluation, questionnaire responses were received from 358 primary and 380 secondary pupils (90% return).   Twenty-six pupil focus groups were held, involving 180 pupils.   The data presented below is drawn from the second year of the evaluation (183 primary and 167 secondary pupil survey responses).   There were no notable differences between the pupil findings in the first and second year of the evaluation.

Findings

The data presented here are drawn from the pupil surveys and focus groups.   Where appropriate, reference is made to teacher views though the detailed data from teacher responses are not presented.

What were ICLs like?

Before reporting what the pupils thought about the AAC lessons, a brief account of some ICLs will help set the findings in context.   The art disciplines represented by the artists included craft (e.g. working with textiles; puppet making; jewellery making; installation art), dance, drama, music, photography/media, visual artists, writers, storytellers and poets.   These were combined variously with environmental studies, personal and social education, modern studies, history, mathematics, science, English, French and German.

A small number of examples are given here.   Some primary classes investigated World War 2, which involved them in identifying relevant questions, undertaking research, and constructing artefacts and an art installation in the classroom representing life during the war.   Dance and drama were linked to scientific concepts such as understanding of molecules, electricity, and principles of evaporation and condensation with pupils linking body movements and actions to illustrate the concepts.   Also in science, animations were made by pupils to illustrate the principles of the food chain; and some pupils learned about the digestive system through making a DVD.   Drama and media were combined to perform and record dramatisation of poetry with a view to heightening both imagination and emotional involvement; they were also used to explore ethical issues in science.

What did the pupils think they were learning?

Since the purpose of the project was to integrate academic and artistic learning, questions were posed in the survey and focus groups to shed light on the extent to which pupils noticed this purpose.

Responses from the pupil survey in the second year of the project to an open question on what they were learning when the artist and teacher worked together in the classroom were:

1	art only mentioned	24%
2	subject only mentioned	23%
3	general learning only	16%
4	subject and art mentioned	13%
5	subject and general learning	3%
6	art and general learning	3%

Overall 39% mentioned the subject, 30% mentioned the art and 22% mentioned some aspect of enhancement of learning.   Around one-quarter focused only on art and one-quarter focused only on the subject.   Many of the pupils appear to have an understanding that the lessons are about learning the

curriculum, with over one-fifth recognising that the approach helped improve their learning skills and other aspects of personal development.

Both in the survey and in focus groups, younger pupils tended to report either the subject or the art as a focus for learning, although most pupils from the end of primary and into secondary school identified that they had been learning both about curriculum topics and different art forms.   For example, pupils who had media and biology said, 'we can put a presentation together now on the digestive system, and we can edit it to make a DVD'.   Older pupils provided more complex explanations including both art and the curriculum and references to developing learning and personal skills such as being creative, using their imaginations, working together and gaining in confidence.

It appears that the integrated approaches developed by the artists and the teachers were effectively focusing on the curriculum while engaging pupils' with the art form and wider aspects of learning.

To what extent did the pupils perceive that the lessons helped them learn better and how did they explain their learning?

In the survey, help with learning was deconstructed as the ease with which the topics were learned because of the way the artist explained the ideas and how easy the pupils found it to remember the ideas from these lessons.   The responses to these questions are illustrated in chart 1.   Over 80% thought that it was easier to learn the topics presented in the lessons with the artist and almost three-quarters thought they could remember the ideas more easily.

Chart 1:   Pupil perceptions of help with learning in lessons in which an artist and teacher worked together
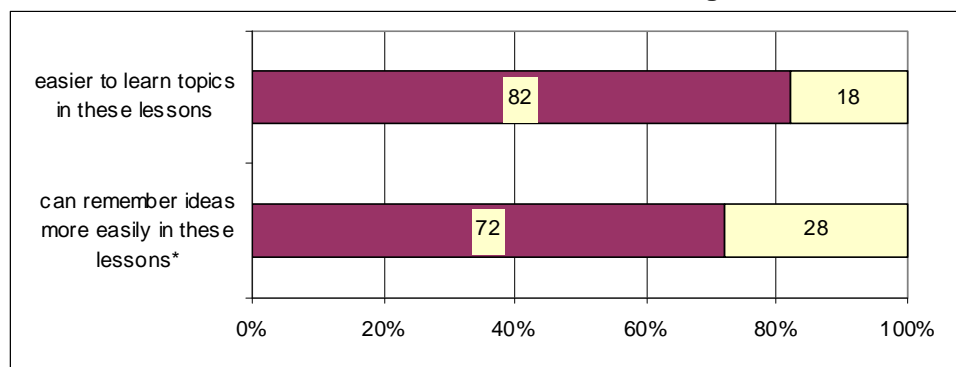
* P4 pupils were not asked this question; the percentages for these responses are based on P6 to S3 figures (n = 311).

Key: agree   disagree or don't know

The focus group responses illustrate what were perceived as effective learning experiences.   Pupils liked having the freedom to make their own decisions about planning and executing tasks, and the secondary pupils commented that it was better when they could work in this way, being allowed to get on with the tasks, rather than have the teacher 'interfere'.

For example, the secondary pupils who had media with biology talked about the satisfaction of 'getting on and doing it' (an indicator of self-regulation) in making a DVD of the digestive system and of the value it had in their learning. They explained:

> *We were interested in what we were doing so it made it easier to get on and do it –*
> *to understand it.*

> *It's better to be left alone – you learn better that way.   The artist doesn't interfere like the teachers do and when you are alone it's your own words.*

> *You usually write what you need to revise but this is a different way of revising – you can go back to the DVD.*

Primary pupils also expressed appreciation of freedom:

> *Our artist let us experiment whereas normally you get told what to do.*

> *We like dance, but it is better with the artist because you make up your own dances.*

Some primary pupils commented that 'the artist took a long time to explain it … you learn it better after the artist has explained it.'   The quality of explanation was evident in a series of lessons where an artist was linking visual art to learning about plants.   The pupils explained:

> *We learned about the cycle of life of flowers and we did planning and research…. The artist taught us parts of plants – to cut up a plant and showed us what aspects we need to concentrate on when we are painting.*

Some of the pupils in this group claimed they were 'inspired' by their experiences in this series of lessons.

On the other hand, sometimes, according to some of the secondary pupils:

> *Teachers give too much detail and they tell you stuff that you don't need to know; we usually forget it 2 minutes later.*

> *Our teacher says it in very complicated ways but the artist can simplify it.*

In relation to remembering, one group who had combined science and dance, explained how, when faced with a test on one of their science topics, they pictured themselves performing the routine associated with the concepts they had learned and this helped them do better in the test.   During the focus groups, it was notable, that many of the pupils were able to recall a lot of the detail of what they had learned.

However, as some secondary pupils explained in one focus group, some ICLs worked better than others:

> *When we were mixing chemicals, when we had the artist we didn't have a clue what was going on.*

Some pupils who thought that ICLs worked well in biology thought that it would have been easier to understand physics and chemistry concepts if they had been told about it rather than '…jumping about kidding on we were light bulbs'. 'It didn't make any sense, it was just a laugh.'   Another group of pupils involved in ICLs with maths and music indicated that they found it difficult to see how the music linked to the maths and that they might have learned it better without the artist. It is possible that in these lessons, the teacher and artist had not identified analogies which were readily accessible to the pupils.   Teachers and artists did acknowledge that a factor in some of the less successful ICLs was that they had selected academic goals and/or artistic content that were too difficult for the pupils.

In relation to improved achievement and understanding, teachers offered evidence of benefits in the following categories: improved pupils' grades in the subject in which the ICLs were introduced; improved pupils' grades in class tests for the particular topic addressed in a series of ICLs, compared with groups taught the same topics without the artist; pupils' completion of homework connected with a series of ICLs; pupils' improved remembering and understanding of concepts taught in ICLs – assessed verbally when new, related concepts were being introduced.   These represent reported views of teachers; due to the very diverse way in which the ICLs were implemented it was not possible to gather systematic data on

attainment.

To what extent did pupils find the learning tasks in these lessons interesting, enjoyable and engaging?

One of the aims of the AAC initiative was to 'increase pupil motivation to learn'. Motivation was deconstructed as interest and persistent engagement with tasks.

When asked about how the art form had helped them to learn the subject, unsurprisingly, many of the pupils explained it in terms of the lessons being more fun and more interesting. One of the main themes was that the lessons with the artist had helped their performance in the class because they were able to remain on-task for longer than they did in non-ICLs, because there was less listening and writing (e.g. note-taking from texts or completing worksheets), which were perceived as reducing their engagement with content. During the focus groups pupils talked at length about the lessons being 'fun' and 'interesting and 'less boring'. Thus, for pupils, their explanations for how the ICLs helped their learning, interlinked with questions on motivation.

Responses to some of the statements related to this aspect in the pupil questionnaires are presented in chart 2. The majority reported that the subject was more interesting, that time passed more quickly during these lessons and that they looked forward to the lessons with the artists.

Chart 2: Pupil perceptions of interest, enjoyment and engagement in lessons in which an artist and teacher worked together
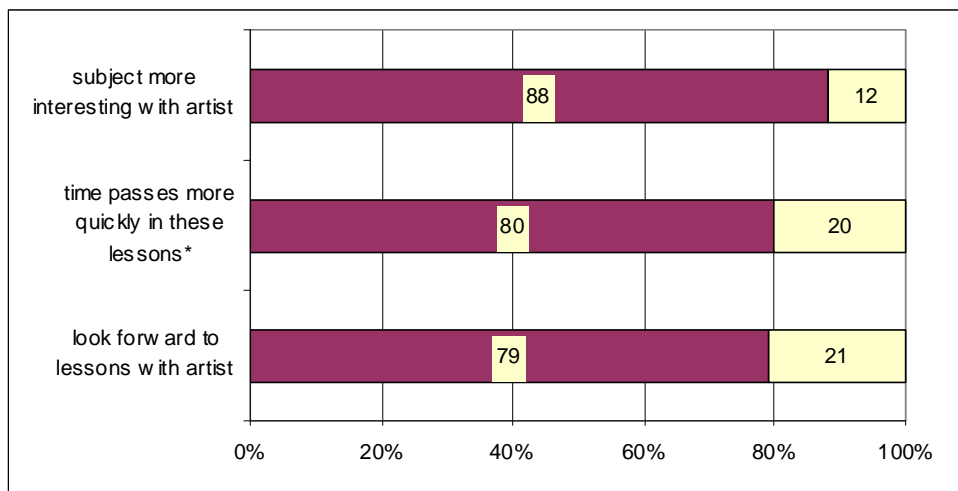
* P4 pupils were not asked this question; the percentages for these responses are based on P6 to S3 figures (n = 311).

Key: ☐ **agree** ☐ **disagree or don't know**

Views expressed in the focus groups included:

> *In normal classes you lose your concentration but not in these lessons* (secondary).
> *There wasn't nearly as much listening, listening gets boring after a while, then you cut off …. or fade away!* (secondary).
>
> *We learned in a different way … a "funner" way instead of reading about it and writing it, we acted it out* (primary).

It is much more fun because you do more rather than watching the teacher write on the board (primary).

While it was clear that the majority of young people believed that having an artist working alongside the teacher had considerable benefits, there were some who did not like doing some of the activities or did not like working with a particular artist or art form.   Comments in response to an open question on the questionnaire about anything they didn't like were made by about 10% of the respondents and fell into 3 broad categories:

1 not liking something about the artist, e.g. the artist telling you what to do, being 'bossy' or 'strict', or being 'big-headed'
2 having to do things you don't want to, e.g. not working with your friends; performing in front of others; rolling on the floor; dancing with others
3 finding it 'boring'

A few other comments were made, such as 'I didn't learn anything'; some people 'made fun of others'; and teacher 'wasted time talking', and 'having to rush to finish' - the last comment being not necessarily negative as far as the arts contribution was concerned.   During the focus groups similar comments were made by a few pupils.

Similar findings were noted by Harland *et al* (2005) in relation to arts interventions in schools.   In any curriculum initiative there are likely to be some dissenting voices.

On the whole, teachers reported increased engagement of the young people during ICLs and said that the interest in the curriculum topic/subject often continued when the artist was not present.   They reported children 'loving it' and 'being excited'.

To what extent did the learning tasks encourage creative approaches, thinking skills and collaborative working?

Creative approaches and thinking skills

For the purpose of the pupil survey, 'creative' approaches were addressed   (operationalised?)as the opportunities to try things they had not done before, to share their ideas with other people, to put new ideas into practice and to be more imaginative.   Responses are illustrated in chart 3.

Chart 3   Pupil perceptions of approaches considered consistent with developing creativity
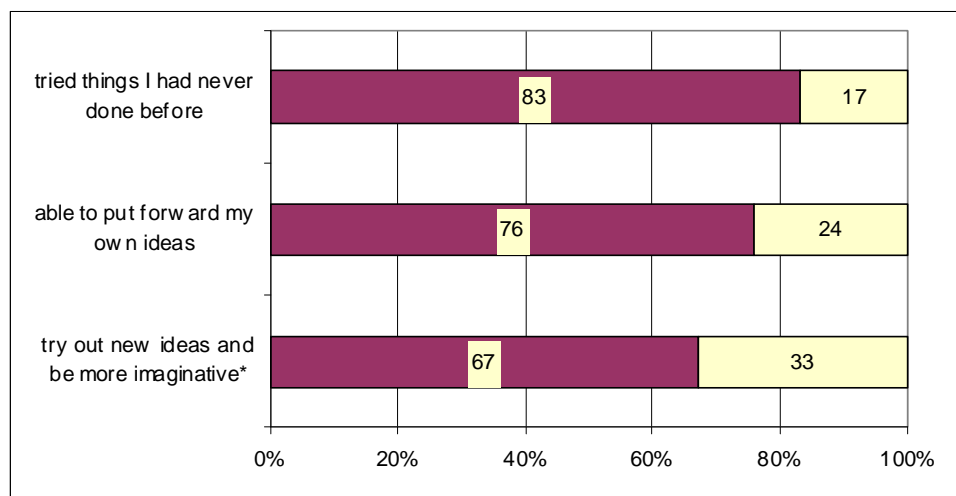
* P4 pupils were not asked this question; the percentages in this case are based on P6 to S3 figures.   Wording of statements varied according to age of pupils.

In open comments about what pupils like about working with the artist and teacher together, one of the themes which emerged what that it encouraged pupils to use their imagination. During the focus groups, one pupil suggested that 'you can find really interesting things when you really think.'

However, there was no evidence of development of creative thinking skills as measured by a set of standardised creative thinking skills tasks (The Torrance Test of Creative Thinking – TTCT). Groups of AAC pupils were selected for more in-depth study with respect to the effects of AAC on creative thinking skills. This was carried out by using a repeated measures design, with completion of instruments near the beginning of the pupils' engagement in AAC and after or near the end of their involvement. As other influences might affect pupil progress, comparator groups were identified to take part. The purpose was not to compare the performance of the AAC and comparator groups directly, but to investigate if those involved in AAC were likely to make greater progress than those who were not.

The main findings were that there were no statistically significant differences in the scores obtained on the TTCT for any of the AAC or comparator groups; and no differences were found between boys and girls. Their experiences did not appear to have made a notable difference to their creative thinking abilities as measured by the Torrance Test of Creative Thinking skills.

One possible explanation, supported by the data gathered during ICL observations, is that there was insufficient time in ICLs for pupils to practise a range of creative thinking skills. Typically, in ICLs pupils responded to questions and represented ideas in an art form, but there was little time for them to talk about the forms of thinking that underlie artistic endeavour. While they were actively engaged in different kinds of tasks and were being encouraged to use their imaginations, there was insufficient focus on the thinking processes to enable pupils to generate ideas in other contexts, whereas, the TTCT, in common with other similar thinking skills instruments, measures the ability to generate relevant questions and other forms of thinking. It was also noted that teachers felt that they did not have time outside the ICL to develop pupils' thinking about an art form because they had to address other curricular demands.

Collaborative working

Responses to questions in the survey indicated that the approaches introduced during the ICLs encourage collaborative working and three-fifths of the pupils agreed that they worked with pupils they did not normally work with, indicating that the arts activities encouraged children to move beyond the groups to which they were accustomed.

Chart 4:   Pupil perceptions of working with others in lessons in which an artist and teacher work together
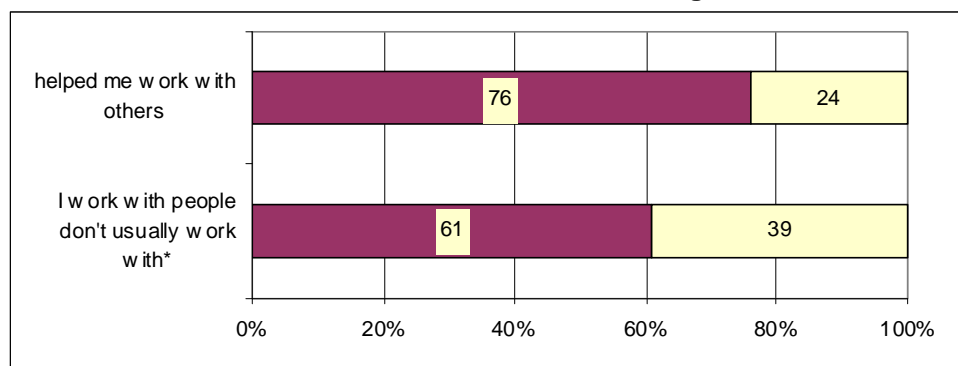
* P4 pupils were not asked this question; the percentages for these responses

are based on P6 to S3 figures (n = 311).

Key: [magenta box] **agree** [yellow box] **disagree or don't know**

To what extent did involvement in the project enhance confidence and self-esteem?

Overall, 70% of the pupils thought that taking part in the lessons with the artist had made them feel more confident.   A small number in the open questions thought that this was something they had learned from these lessons.   Pupils talked less about developing confidence in the focus groups than about other aspects of the experience, however, it was noted by some that it gave them confidence to try things they had not done before.

Teachers were extremely positive in their views that the experience of the ICLs had enhanced pupil confidence and self-esteem, with some focusing on benefits for particular pupils.   Such views are encapsulated in the following example:

> *There were two very withdrawn pupils in the class and there were two special moments when one of them stood in front of the class and delivered a thoughtful individual talk, smiling all the way through. The other pupil wrote on his feedback sticker, "I am confident now".*

Discussion

The findings of the evaluation are discussed in two ways: firstly, in relation to findings from other evaluations of art-infused approaches to curriculum delivery and, secondly, in the light of constructivist approaches to learning.   The purpose of the latter is not to engage in an extensive elaboration of constructivist/social-constructivist views on learning, but to point out how aspects of pupil talk and explanation of what was 'good' about ICLs align with constructivist views.

Other evaluations and research

The findings from our evaluation of the Arts Across the Curriculum project on the impact on pupils were similar to those found in other studies.

Improved learning

Pupils indicated that they thought that they did learn new ideas more easily and remembered them better. This was explained in terms of the way in which the artists led the lessons and provided opportunities for active learning in which they were given responsibility; the lessons involved less sitting, reading, writing and copying.   Additionally, teachers provided specific examples of where they had noted improvements in test scores and better recall of concepts which reduced the need to 're-teach' topics.   The diversity of practice in AAC meant that any overall tracking of learning gains in terms of national assessment and examination results was inappropriate.

However, generally, evidence that learning gains from specific arts interventions transfer to better learning overall and improved attainment, in terms of improved performance in national testing or examinations, is elusive.   Further, evidence from the literature suggests that such gains might only be expected to occur after consistent, long-term participation in interventions.   For example the Evaluation of the Chicago Arts Programme in Education (CAPE) (Catterall and Waldorf, 1999) revealed that after 4 years CAPE schools began to show significant differences in maths and reading compared to non-CAPE schools; impact was more likely to be evident at elementary levels.

The evaluation by Upitis and Smithrin (2003) of *Learning through the Arts (LTTA)*, a large-scale arts integration programme in Canada, used standard tests for maths and English on a large sample of pupils from Grades 1 to 6 in LTTA schools and in control schools, tracking progress over three years.   This study found no significant differences on most measures and drew the conclusion that 'involvement in the

arts for the students in the LTTA schools did not come at the expense of achievement in mathematics and language' (p17).

As part of the evaluation of the Creative Partnerships programme, Eames *et al* (2006) undertook an analysis, using multilevel modelling, of national assessment and qualifications scores in English, maths and science for young people at key stages 2, 3 and 4.   This study evidenced limited positive impacts for those involved in arts interventions but the differences were not large enough to be confident that they were educationally significant and it could not be concluded that Creative Partnerships activities had caused the observed differences.

Impact on pupil motivation

There was strong evidence from pupils (and teachers) that they found the experience of working with artists helped to make curricular topics interesting, enjoyable and fun.   Such findings are strongly evident in the literature (e.g. see Catterall & Waldorf, 1999; Upitis & Smithrin, 2003; Harland *et al,* 2005; Ofsted, 2006; Cochrane & Crockett, 2007).

Reasons given in the above literature for the strong motivational impact of arts interventions, all of which were evident in the AAC initiative, include:
1   having clear and tangible outcomes to work towards
2   authentic experiences
3   the intrinsic value of the activity
4   contact with skilled professionals
5   contact with adults who were not teachers, who were not part of 'the system' and who did not take account of their 'school history'
6   learning was active and 'hands-on'.

Impact on confidence and self-esteem

There was evidence from pupils and teachers that pupils gained in terms of developing confidence. Teachers spoke emphatically of benefits to children's self-esteem.   These findings are confirmed in other studies.   For example, Harland *et al* (2005) found that the development of self-esteem and social interaction were amongst the most frequently reported outcomes of arts interventions.   Ofsted (2006) and Catterall and Waldorf (1999) found similar reports from teachers.

Development of creative approaches and thinking skills

Evidence from pupils suggests that they were engaging with approaches that should encourage the development of creativity and so by extension creative thinking skills, for example, generating their own ideas, working in new ways and with new ideas, solving-problems and working collaboratively.   However, tasks used to specifically explore creative thinking skills with a small sub-sample of AAC pupils and a control group, showed for that specific group at least, the AAC intervention had not led to any development in creative thinking skills.

Harland *et al* (2005) found that the development of thinking skills were nominated amongst the least frequent outcomes of arts interventions and Ofsted (2006) found that while most Creative Partnerships programmes were effective in developing in pupils some attributes of creative people, the pupils were often unclear about how to apply them independently to develop original ideas.

On the other hand, a study into the effect of arts-integrated lessons compared to non arts-integrated units on learners' cognitive processes by DeMoss and Morris (2002) found that learners demonstrated greater analytic interpretation after the arts-integrated units. Analytic interpretation was judged by evidence of interpretation, analysis, synthesis or evaluation of the subject matter in students' writing (pp 9-10).   The arts-integrated lessons which produced this result, however, had particular characteristics which they describe as having arts and curriculum content 'tightly coupled'; in these cases arts were used as applied concepts for investigating and expanding content as opposed to summarising or enhancing 'regular' content.   Such lessons required careful joint planning with the artist 'clearly attuned to the academic content'.

Most research (e.g. Livingston *et al,* 2004) suggests that any form of thinking has to be practised quite intensively before a measurable impact occurs, and the nature of the thinking needs to be made explicit. In the more successful initiatives (e.g. McGuinness, 2005), forms of thinking embedded in an art form or academic subject have been identified at a planning stage and the different forms have been systematically and explicitly introduced and practised in each lesson. An example of such an initiative in the arts is the Artful Thinking Program, which was designed and implemented through a relationship between Project Zero at Harvard University and Traverse City Area Public Schools (Tishman & Palmer, 2006; Ritchart et al, 2006).   Taxonomies of thinking (e.g. Moseley *et al,* 2004) provide a landscape of thinking processes that can be developed.   While other aspects of the evaluation indicate that pupils have benefited, it became clear that the overall planning of the project had not incorporated messages in the research literature on developing thinking.

While the presence of the artist along with the teacher is beneficial, the mere presence of a creative person will not help young people develop creativity or creative thinking skills.   The creative thought process needs to be made explicit, dialogue and discussion should be built on problem-solving and creative thinking models, and tasks set need to be designed to require the use of such skills and provide the opportunity for pupils' creative expression.   This implies the kind of careful planning endorsed by DeMoss and Morris (2002) that includes explicit, systematic practice of the thinking skills.

Constructivist theories of learning

The above discussion on thinking skills is, of course, integral to the discussion on constructivist and social constructivist theories of learning.

Brophy (2002) highlights the recommendations of Applefield et al (2001) for pedagogical approaches that emerge from constructivist principles of learning.   The overall goal is to 'stimulate thinking in learners that results in meaningful learning, deep understanding, and transfer to real world contexts' (pxii). Amongst the features that contribute to this are authentic tasks, multiple ways of representing key ideas, generation of questions and hypotheses which are tested by the learners, reflection and dialogue within a community of learners.

Inherent in constructivist approaches is primacy of dialogue in developing thinking skills and in the construction of knowledge.   A fundamental assumption is that talk/dialogue is more than a means for sharing thoughts: it is a tool for the joint construction of knowledge by teachers (and, in this case, artists) and learners (Mercer, 1996).   Careful questioning and modelling of thought processes are crucial aspects of dialogue that takes place between learners and experts and between learners and other learners.   The purpose of talk is to stimulate learners to ascertain and resolve, *for themselves*, what is confusing or problematic (Brophy, 2002).

Such methods encourage students to find questions worth pursuing, to pursue their questions through self-directed search and interrogation of knowledge and to debate their emerging views with others. Such practices are informed by the idea that teaching approaches should encourage learners to be more self-directed and autonomous (Soden, 2003, in Bryce & Humes).

Authentic tasks are important for learners.   Hands-on activities or finding solutions to real-life problems and issues are more likely to make learning meaningful.   Authenticity is also about linking new learning to the 'real-life' understandings of the learners.   Key to developing understanding is finding analogies that make sense to the learners and can bridge the relationship between concrete and abstract, existing knowledge and experience and new concepts. (Bryce and Macmillan, 2005)

AAC, ICLs and constructivist views of learning

The views of the pupils suggest that what they found satisfying and helpful about the ICLs in improving the learning experience align to approaches to teaching supported by constructivist principles of learning.

One of the strongest themes in pupils' explanations of how the ICLs had helped them learn relates to

self-direction. They emphasised the value of finding out for themselves; being allowed to experiment, and deciding for themselves what to do rather than being told.   They appreciated being 'left to get on with it'.

This freedom was supported by the artists in a way that pupils' perceived as being less-intrusive than their normal experience of teachers.   They appreciated the artists' explanations and their offering of direction rather than providing answers.   The quality of the dialogue with the expert encouraged them to find answers for themselves.   Working with peers on joint activities encouraged sharing of ideas and learning together.

Artists came from outside the school bringing their experiences and skills with them, presenting authentic arts experiences to the pupils.   The pupils became interested in and excited by participating in the 'real life' of the artist.   For the most part, the artists and teachers were able to create analogies between the artists' 'real world' and the curricular goals.   The learners were able to make connections between what they did with the artists and the theories of biology, the life of plants, what life was like in another age, the principles of creative writing …. to name but a few.

The notion of bridging analogies also helps to explain why some ICLs might have been more effective than others.   Bryce and Macmillan (2005) point out that, if analogies are to be effective bridges between concrete illustration and the abstract understanding that is necessary for progress, they need to be carefully chosen.   In the more successful ICLs, aspects of art forms were identified that offered more accessible representations of concepts, whereas in the less successful ICLs, the chosen aspects of the art form appeared to obscure understanding.   It is possible that, for some concepts, the more effective analogies for bridging understanding will be found in areas other than art forms: for instance, young people might grasp some physics concepts more easily if they are encouraged to relate them to their experience of playing snooker or football rather than representing the concepts through dance or other art forms.

As with the developing of creative thinking skills, the development of successful conceptual analogies between art forms and other curricular disciplines requires shared understandings between the artist and the teacher and careful planning.

Overall, the features of ICLs that engaged pupils the most are those connected with teaching based on social constructivist views of learning.   While working with an artist is only one of many ways of designing constructivist lessons, pupils' responses in surveys and focus groups suggest that it is an effective way of promoting constructivist approaches. Such active, experiential learning is characteristic of both arts practice and arts education (Coutts, 2003, in Bryce & Humes).

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Annexe: Arts Across the Curriculum: Number of respondents to surveys and interviews (all participants)

The sample sizes and response rates for all surveys are given in table 1.

Table 1:   Survey samples and response rates

	Target	Achieved	Response rate
Stage 1			
Artist initial questionnaire	26	19	73%
Artist second questionnaire	30	26	87%
Teacher initial questionnaire	49	36	73%
Teacher second questionnaire	50	44	88%
Primary pupil questionnaire	200	175	85%
Secondary pupil questionnaire	220	213	97%
Stage 2			
Artist 'new start' questionnaire	5	3	60%
Artist third questionnaire	35	23	66%
Teacher 'new start' questionnaire	18	15	83%
Teacher third questionnaire	47	35	74%
Primary pupil questionnaire	200	183	92%
Secondary pupil questionnaire	200	167	84%

These represent a good return rate and, although the artist return rate in stage 2 was lower, the responses are sufficient to be taken as representative.

The number of participants interviewed is given in table 2.

Table 2:   Number of AAC participants and others who were interviewed

	Number of individuals
Phase 1	
CLOs and SAC staff	9
Headteachers/SMT	22
Phase 2 – stage 1	
Artists (individually)	7
Teachers (13 individually, 14 in 3 groups)	27
Pupils (in 17 groups)	112
Parents (in 6 groups)	14
Phase 2 - stage 2[1]	
Artists (individually)	6
Teachers (individually)	12
Pupils (in 9 groups)	68
Parents (individually)	21
CLOs and SAC staff	9

[1] At stage 2, additional artist and teacher interviews occurred as part of the in-depth study.   Members of school senior management teams were also interviewed as part of the in-depth study.

Additionally six artists provided rich data through the compilation of video diaries.

Three schools participated in an in-depth study and included 4 artists, 4 teachers, 3 classes of pupils, 3 headteachers and the Creative Links Officer.

In the first year 19 observations matching the observation criteria were completed, with 13 in the second year.   Further class sessions with artists were observed in both years but they were either preparatory or follow-up to ICLs and as such did not constitute lessons matching the observation criteria.