B. J. Music Ed. 2001 18:2, 173–185

The SCARLATTI papers: development of an action research project in music

Charles Byrne and Mark Sheridan

c.g.byrne@strath.ac.uk
mark.sheridan@strath.ac.uk

Since its inception in 1997, the SCARLATTI Project at the University of Strathclyde in Glasgow has sought to investigate and document the teaching approaches and methodologies adopted by music teachers in Scottish secondary schools and to share good practice, findings and thoughts among the profession. Here, as a follow-up to a previous article (Byrne & Sheridan, 1998), readers are brought up to date on developments since then, highlighting some problems and some successes. The article also focuses on issues related to the delivery of core or key skills through music and introduces a new composing thinking tool for novice composers. Finally, a report on a small-scale study on music teachers' teaching styles is given. Having collected 'data on the teachers' backgrounds, qualifications, experiences and accomplishments in the creation of music through improvising and composing' (Byrne & Sheridan, 1998: 299) these are analysed and some initial thoughts offered.

Introduction

The Strathclyde Consortium for Action Research in Learning Approaches and Teaching Techniques in Inventing (SCARLATTI) Project was initiated in 1997 by two researchers at the University of Strathclyde in response to concerns about composing and improvising in Scottish secondary schools. Its broad aims were to create 'an effective communication network, which allows materials, good practice and experiences to be shared' (Byrne & Sheridan, 1998: 299) and it has already produced interesting results and findings. In pursuit of these aims the objectives can be described as:

- Examination of current practice
- Identification and sharing of good practice
- Collection of data on current and good practice through a variety of means
- The establishment of a World Wide Web discussion group
- The creation of a forum for the examination and feedback of views from the wider educational community

Such was the level of interest by teachers in the areas of composing and improvising that by November 1997, eighty-five schools had indicated their willingness to be involved in the project at different levels: ranging from school visits for personal interviews and the completion of questionnaires, to inclusion by electronic means (WWW and e-mail) and the occasional information newsletter. To date all of the objectives have been achieved to

a greater or lesser extent with some aspects flourishing more fully than had originally been expected. Identification and examination of current and good practice has revealed a rich seam of data, some of which will be discussed at length in this article. The project team has collected a variety of evidence including oral and textual responses and, in addition, many hours of video data have been recorded and coded to identify particular methods and practices in the classroom.

In contrast to these successes one area which has taken much longer to develop than anticipated is the WWW discussion group at the Clyde Virtual University (CVU). While many academics and students have participated in the electronic discussion forum, few teachers have submitted comment, although there is evidence to indicate that the information and materials are being regularly accessed and downloaded by large numbers.

Certain aspects of the work have developed very fruitfully particularly in relation to core or key skills in critical thinking and problem solving; techniques related to peer learning (Vygotsky, 1978) and powerful learning environments (DeCorte, 1990, 1995) which have influenced the researchers' own thinking.

Discussion and evaluation on the WWW

Despite the intentions of thirty schools to sign up to the electronic forum, actual involvement has been sluggish. Traditionally there has been a great willingness among music teachers in Scotland to share ideas and concerns, to discuss new approaches and to air views and opinions. It appears that at this stage the electronic medium is perhaps not the best way so to do. There have been over fifty-four contributions to the discussion group including numerous from academic staff in Strathclyde and the wider community but only one from a classroom teacher. There may be a number of reasons for this, including: lack of immediate and easy access to computing facilities with WWW and training for teachers in school to enable them to contribute; time restraints; the forum may be daunting given the nature of some of the papers at the site which challenge current practice; the HyperNews technology may be difficult or awkward to use. This is an area where further research would be useful, perhaps sharing experience with other researchers in the field. The WWW may also encourage people to look but not to engage. This view is confirmed by the response to a series of composing lessons placed on the WWW (http://www.strath.ac.uk/Departments/AppliedArts/lessonmenu/complessons.html) as a further development to SCARLATTI. The site for the lessons is regularly accessed and materials downloaded, but there have been no evaluations returned and few messages sent to the project. This state of affairs may change as music departments acquire computing facilities with the prerequisite software and access to the web, an aspiration implicit in the Higher Still developments (HSDU, 1997) for music. For the authors, the development of the electronic lessons has been a significant innovation with immense potential for future learning strategies and research, in that it enables us to reflect on the nature of learning through an electronic medium. The composing lessons are based on original material with individuated learning guides to encourage critical thinking processes and reflection on the part of the participant. Evaluation and development in this area is planned and dissemination of findings will be a major feature of future work.

The wider educational community

The project team issue newsletters and other information from time to time about progress and events that may be of interest. The team are involved in one of the largest winter music festivals in the world, 'Celtic Connections' at Glasgow Royal Concert Hall, and intimations and invitations to various masterclasses and discussions by composers and musicians across a wide variety of styles have been issued to participants in the project. James MacMillan, visiting professor to the University, and singer-songwriter Dougie MacLean are just two of the musicians who have taken part and their involvement has enhanced the project and provided the team with excellent video material for analysis and further dissemination.

Extracts from these video resources have been used to support a major section of a CD-ROM, 'Effective Music Teaching' (HSDU, 1998) produced as part of the Higher Still development programme, a major staff development exercise providing training and resources for teachers in the delivery of the new curriculum. The material from the SCARLATTI project deals specifically with core skills in music and teases out the relevant extant literature from a variety of sources. Those core skills which were reviewed were critical thinking and problem solving. Government publications from the late 70s to the present day are cited (SED, 1977a; SED, 1977b; SED, 1978; SCCC, 1989; HSDU, 1996; HSDU, 1997) demonstrating the presence and development of the concepts behind core skills as a feature in curriculum change and the fact that contemporary education has moved from recognition of core skills to reward through entitlement and assessment. A range of literature on thinking is also cited from the theoretical work of Dewey (1910, 1966), Wallas (1926, 1945), Rossman (1931), Guilford (1967) and Webster (1988) to that of MacGuinness and Nisbet (1991). Information and examples of thinking tools such as mind mapping in the writings of Buzan (1974) and other approaches such as the work of de Bono (1976, 1982, 1983).The concepts of capable peers, their role in the learning process (Vygotsky, 1978) and DeCorte's 'powerful learning environments' (1990, 1995) are potentially of significant interest to musicians and music educators. This discussion of the literature is supported on the CD-ROM by video clips of composers discussing their work clearly within the terms of reference of critical thinking.

Through the Core Skills section of the CD-ROM, teachers were introduced to a new thinking tool, ORIENT, which brings together many of the ideas on the various stages of the creative process. The team were conscious of the fact that there is no strong tradition in Scotland of teachers reading and writing about research so, to gain a foothold on teachers' awareness, ideas from the literature were presented in a practical context.

ORIENT is a series of steps which the composer can use at various stages in the creative process. It provides a structure or scaffold (Wood, Bruner & Ross, 1976) which both teacher and learner can use as a thinking tool when making decisions on the nature of the composing task, the direction and shape of the work, and in ensuring that opportunities for revision and evaluation are built into the process.

There are four steps in this procedure which may be carried out in any order. The steps are:

- Options – list a range of possible options
- Review, Reflect or Revise

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- Interim Evaluation
- New Thoughts

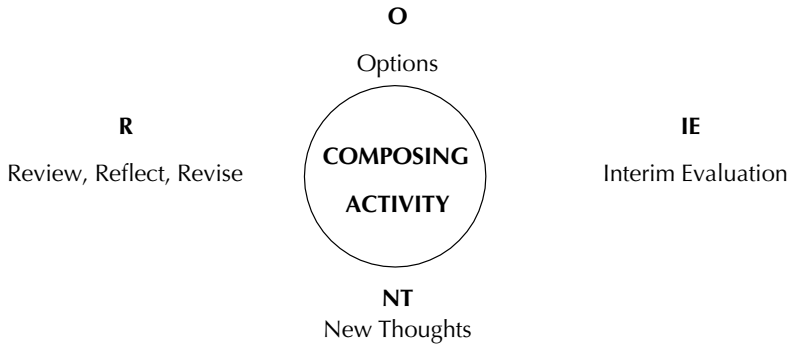

Fig. 1 *ORIENT model*

As Figure 1 illustrates, this is a dynamic process that can be likened to a mental three-dimensional rotating mobile which is present throughout the composing process. All parts are interrelated, connectable from any point and can influence any other.

The research perspective, context and methodology

In a previous article (Byrne & Sheridan, 1998) reference was made to some of the concerns about music teachers' training as expressed by Michael Mark (1978) and John Paynter (1982). Specifically, Mark's observation that

> Many teachers had not personally experienced creative accomplishment and were therefore not secure in an atmosphere of creativity (p. 110).

The researchers were comfortable with this view as it seemed to compare with their own experiences as teachers and composers. There was, however, a need for a strategy of conscious objectivity to avoid arriving at conclusions prior to the collection and analysis of data.

What type of evidence would confirm or confound the view that lack of 'creative accomplishment' was the probable cause of teachers' lack of security within the Inventing element of the music curriculum? The need for 'thick descriptions' of teachers' background, musical training and interests (Bresler, 1995) as well as teachers' conceptions of their own teaching strengths and abilities as possible indicators had been highlighted. During visits to schools the project team and research assistants carried out repeat interviews with teachers who were asked to give a factual account of their qualifications, subsequent teacher training and any additional qualifications, professed areas of specialism, own musical and teaching strengths and an indication of their composing experience whether at undergraduate or postgraduate level. From the teachers' responses it was possible to determine whether they described themselves as composers, arrangers, improvisers or none of these. Composing in received styles as part of a university or college course was categorised as arranging experience since formal and stylistic templates

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are often given and the results are seldom performed either privately or publicly. In addition, some respondents mentioned that they had no experience of original composition. Similarly, orchestration exercises were deemed to be arranging activities for the same reasons. Evidence of public performance of original compositions at undergraduate level was a strong indication of undergraduate composing experience and several teachers reported carrying out major composition projects as part of their final year work while at university or college. A few described their undergraduate work as consisting mainly of tuition in harmony and counterpoint and these teachers described themselves as being neither composers nor arrangers.

At postgraduate level, evidence of public performances such as composing or arranging for school shows, composing original material and arranging melodies for classroom use were taken as indicators of a continuing interest in either composing or arranging. These descriptions by teachers of their own creative experience at both undergraduate and postgraduate levels created an initial picture of teachers' conceptions of themselves in this area. A balance between undergraduate experience and continuing interest placed each of the twenty-eight teachers into one of three categories: Composer, Arranger or neither Composer nor Arranger. A small number of teachers described their interest in jazz and rock music in general and in improvisation in particular, although the implications for the teaching styles and approaches of this group of teachers is not discussed in this paper.

The research also sought to determine what teachers and pupils were actually doing during inventing sessions in Years 1 to 4 in the secondary school (S1 (ages 11–12) to S4 (ages 14–15)). In the second part of the interview, teachers were invited to select from a given list the types, and frequencies of inventing activities which were carried out in classes from S1 to S4. The list, although not exhaustive, was arrived at by considering our experiences as teachers and as teacher trainers who regularly visit schools and observe student music teachers operating within the curricular guidelines of music departments. The random order of the list was deliberate in order to avoid any suggestion of hierarchy or particular bias, and teachers had to indicate whether these activities were carried out regularly, seldom or never. Since administering this section of the questionnaire, we are confident that very few additional categories could be added to the list which are significantly different from those that appear in the following tables (see Table 1).

Initial examination of the data from the first two parts of the interview questionnaire highlighted inventing activities which would be strong indicators of teachers providing different types of learning opportunities for pupils: open and closed.

Open and closed learning opportunities

Open learning opportunities were characterised as those having no single predetermined possible outcome but provide pupils with frameworks within which they can engage and develop their own critical thinking skills in a musical context. In our view, exploration in sound, experimentation with pitch and rhythm, musical play and opportunities to work in groups are key ingredients of open learning activities. Since there is no predetermined single outcome, teachers can allow learning opportunities to develop, suiting individual learner's styles, aspirations and goals. It is interesting to note that in a study of 142

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Table 1
Enter **R – Regularly; S – Seldom; N – Never** for each year group column

Inventing activity	Year group S1	S2	S3	S4
Example Waiting for the muse	R	S	S	R
Melody over chord progression				
As above PLUS rhythmic template				
Composing Pentatonic melodies				
Improvising Pentatonic melodies				
Blues scale improvisation				
Composing Blues melodies				
Rhythmic improvisation with rhythm bank				
Melody writing				
Minimalist / process styles				
Received styles				
Rock chord progressions				
Latin American rhythms and styles				
Development of musical cells				
Programme Music i.e. story board, poem				
Sound Picture				
Sound Collage				
Setting of words to a melody				
Creating Bass part to well-known tune				
Creating counter-melody to known tune				
Creative Music-making projects				
Free composition				
Group composition				

undergraduates, Kreber (1998) found significant relationships between learners' critical thinking and their ability to engage successfully in self-directed learning. The value of learning how to learn has also been identified by Candy (1991), Brookfield (1985), Mezirow (1985) and others (HSDU, 1996) as important in equipping students with lifelong learning skills. Kreber (1998: 79) argues that 'educators can foster lifelong learning by providing opportunities for students to develop both their intuition as well as their logical reasoning skills' and suggests that intuition and logical thinking can be developed by providing activities which 'will spark students' imagination, ask them to envision alternatives, and require them to pose questions' (Kreber 1998: 83). These views articulate well with the stages in the creative process (Dewey (1910), Rossman (1931), Torrance (1965), Wallas (1926; 1945), Webster (1988), Weisberg (1986)) and further reinforce the ORIENT conceptual musical thinking model outlined earlier in this article.

For instance, activities such as Sound Collage can involve the use of found sounds and can engage children in thinking about sounds, what music is and how it is constructed and about how best to structure musical ideas. The stimulus for a Sound Collage can be

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either musical or extra-musical and the children who are doing the exploration can themselves determine what is and what is not included. In essence, these open-ended learning activities afford divergent thinking rather than convergent thinking opportunities (Guilford, 1967).

By contrast, closed learning opportunities offer fewer opportunities for experimentation, sound exploration and creative play. Problems are often formulated in a way which excludes free and original thought, although there may be more than one correct answer. The contrived nature of problems such as creating a counter-melody to a well-known tune are described as 'occupying knowledge-restricted problem environments' (Scardamalia & Bereiter, 1985: 66). Thinking must therefore be convergent, with possible solutions being tried and tested (Wallas, 1926; 1945) as the process involves the solver in selecting one set of permutations which closely match the predicted outcome.

Fisher (1995) argues that teachers ask too many closed-type questions which require lower-order thinking skills. He explains that 'Questions which ask for *application, comprehension* and *knowledge* demand less complex and thus 'lower' levels of thinking' (Fisher 1995: 18). It is the closed nature of the musical composing task that is symptomatic of the teaching for examination approach. Open composing tasks allow children greater freedom to think and express their individuality making use of what they already know about how music is put together. In musical composition, such a focus is comparable to the notion of 'problem solving in a knowledge-rich domain' outlined by Scardamalia and Bereiter (1985: 67) in the area of expository writing.

Analysis of teacher response

For the purposes of analysing the findings of this small-scale study then, two distinct teaching and learning approaches have been defined: Closed Critical Thinking Activities (CCTA) and Open Critical Thinking Activities (OCTA) (Table 2). The other activities which have particularly individualistic characteristics, i.e. minimalist/process styles, do not readily fit into either of the defined categories and so a third category, Other Activities, was created. Depending upon how the teacher utilises these other activities such as 'Minimalist/process styles' and 'Rock chord progressions', these could be either open or closed activities. In the absence of any evidence based on actual observation it was deemed prudent to define these teaching and learning activities as neither open nor closed.

Table 2 *Two types of thinking deployed in composing tasks*

Open Critical Thinking Activities (OCTA)	Closed Critical Thinking Activities (CCTA)
Development of musical cells	Melody over chord progression
Programme Music i.e. story board, poem	As above PLUS rhythmic template
Sound Picture	Rhythmic improvisation with rhythm bank
Sound Collage	Melody writing
Creative Music-making projects	Received styles
Free composition	Creating Bass part to well-known tune
Group composition	Creating counter-melody to known tune

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Summary of initial findings

The twenty-two inventing activities were divided into three main types which, if the views of Mark (1978) and Paynter (1982) were to be confirmed, would indicate a preference for experimental, explorative activities by the pupils of teachers who described themselves as composers with fewer instances of such free and open-ended activities among the pupils of those who described themselves as arrangers. What we found was surprising.

Composers actually employed Closed Critical Thinking Activities (CCTA) and Other Activities in equal measure and, in total, four times as often as Open Critical Thinking Activities (OCTA). In comparison arrangers employ CCTA and Other Activities in combination in frequency only three times as often as OCTAs. Those teachers who were categorised as arrangers appear to use a wider range of inventing activities, averaging 22.5 different learning activities in inventing across all four years. Composers, on the other hand, average 19.6 learning activities on a regular basis.

The data also provided signs of teachers favouring particular activities in particular years. In some cases it was extremely difficult to gain an accurate picture of the types of preferred activities since it appeared that no single inventing activity was adopted regularly. A few teachers (six) seemed to favour a very limited range of CCTAs such as 'Rhythmic improvisation with rhythm bank' in Years 1 to 4. Eight teachers utilised a range of activities in an almost random way across all years. One teacher used only CCTAs in S1, a mixture of CCTA , OCTA and Other Activities (including improvisation) in S2 with an emphasis on specific composing activities (CCTA and OCTA) in Years 3 and 4 with each of these years having one single OCTA; 'Development of musical cells' in Year 3 and 'Free composition' in Year 4. The only activities which this teacher engaged pupils in on a regular basis were 'Composing pentatonic melodies' and 'Melody over chord progression', both of which appeared in Years 3 and 4. Some respondents may have affected the reliability of the data by appearing to do nothing but inventing. The inventing activities which were regularly undertaken by S1 (ages 11–12) pupils in one secondary school are listed below (Table 3).

Table 3

Inventing activity	Regularly engaged in by pupils in years
Melody over chord progression	1 – 4
As above plus rhythmic template	1 – 4
Composing pentatonic melodies	1 – 3
Creative music-making projects	1 – 4
Rock chord progressions	1 – 4
Rhythmic improvisation with rhythm bank	1 & 2
Programme music, i.e. story board, poem	1 & 2
Sound Picture	1 & 2

Some tasks may be perceived by teachers as being difficult and only approachable by more experienced pupils. For example, 'Melody writing' and 'Free composition' are only undertaken by S4 pupils in this school. Another school reveals a scatter-gun effect in Years

1 to 3 by utilising a range of activities not very often and then settling upon two specific activities that only S4 pupils engage in regularly; 'Melody over chord progression' and 'Blues scale improvisation'.

It is clear to us that this section of the exploratory questionnaire has raised several issues which could prove to be important in further work in the field. Our questionnaire did not explore fully the specific classroom organisation approaches adopted by teachers during inventing lessons. We would be keen to know to what extent many of these activities were considered, by student and teacher alike, to be solo activities. The ranking of 'Group composition' at number 20 out of 22 different activities (see Table 4) suggests that collaborative work is not given a high priority although our analysis does not provide compelling evidence of this. For instance, there were no discussions between teachers and researchers as to how children carried out tasks like 'Melody over chord progression', rated the single most popular teaching activity (we have yet to hear the students' side), and whether paired or small group work was encouraged and supported by the teacher.

Table 4

Frequency of various inventing activities. Teachers (n = 28) were asked to indicate whether classes from S1 to S4 engaged in any of the following activities Regularly, Seldom or Never. A scoring system allocated 2, 1 and 0 points respectively. Therefore, for each activity a total of 8 points were available if the teacher considered that all year groups engaged in a particular activity regularly.

Inventing activity	Frequency
Melody over chord progression	159
Melody writing	120
Composing Pentatonic melodies	114
Blues scale improvisation	106
Improvising Pentatonic melodies	103
Melody over chord progression PLUS rhythmic template	95
Rock chord progressions	91
Free composition	91
Creating counter-melody to known tune	80
Composing Blues melodies	79
Creating Bass part to well-known tune	70
Rhythmic improvisation with rhythm bank	68
Latin American rhythms and styles	65
Creative Music-making projects	65
Received styles	57
Programme Music i.e. story board, poem	57
Setting of words to a melody	48
Sound Picture	45
Development of musical cells	44
Group composition	40
Minimalist/process styles	27
Sound Collage	21

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Discussion

Inventing activities which are described as being Closed Critical Thinking Activities (CCTA) correspond with many of the arranging activities identified at undergraduate level in the first part of the questionnaire. Composing in received styles and following formal and stylistic templates usually require a response something close to a correct answer and may suit pupils and teachers whose thinking could be described as being convergent (Guilford, 1967). Activities such as 'Creating a bass part' or a 'Counter-melody' to a 'well-known tune' very often involve the use of notation which can be construed as a constraining device. Since notation has played a significant part in the education of the teacher, it may be extremely difficult for her to refrain from its use in a composing lesson. The use of figural representation by teachers and pupils is seen as representing achievement and evidence of concrete knowledge in a domain (Bamberger, 1991). Since 'notations-in-use by a community of professionals tend to gain a privileged status' (Bamberger 1991: 15), teachers can perhaps be forgiven for being over-eager to admit their pupils into the grand order of musical notation users.

The addition of a 'Melody over a chord progression' activity may have many inherently correct answers although, in the first two years of the secondary school, this approach is often managed in the classroom as a paper exercise, and opportunities for sound exploration are very limited. The addition of a 'rhythmic template' places further constraints on the pupils, with fewer possible correct answers. The 'Melody over a chord progression with a rhythmic template' activity often follows on from the performance of a tune, either by the whole class or by the individual pupil, placing even further limitation on the pupil's scope for being creative. This type of activity can become little more than a paper based, computational exercise in which notes of the appropriate given chord are matched to the rhythm of a well-known tune. Although the activity may be a valuable one in developing the learner's logical-mathematical skills, placing such activities at the core of the musical inventing curriculum is, at best, misguided. For some pupils, this type of inventing exercise may be their only insight into the world of the composer. Pupils themselves know the value of their own products and are not to be duped by quick-fix methods of apparent achievement. When the product is achieved by a process within the musical domain then a feeling of pride and satisfaction can be achieved. What Csikszentmihalyi describes as the 'autotelic personality' could well apply to the ways in which children approach inventing activities in the classroom.

> Applied to personality, autotelic denotes an individual who generally does things for their own sake, rather than in order to achieve some later external goal (Csikszentmihalyi 1997: 117).

It may be more rewarding for children to engage in composing activities when they feel a strong sense of the activity having its own intrinsic value and the task generating challenge, requiring concentration and the exercise of a degree of skill (Csikszentmihalyi, 1992).

The provision of musical composing tasks that will stimulate divergent thinking styles is the main characteristic of Open Critical Thinking Activities and is the antithesis of the composing in a received style activity requiring a 'correct answer'. Of course, it is vitally important that student teachers and qualified teachers understand the importance of their own role as a co-composer in the classroom. Composing is not something that teachers do

to children; rather it is an activity that they and other pupils can do with each other. This 'modelling' by a skilled expert (McGuinness & Nisbet, 1991) is a key part of the learning process. John Howard gives a slightly different spin to the familiar question 'Does the (student) teacher compose or do the pupils?' (Howard 1988: 29) by suggesting that the opportunity for teacher and pupil to interact creatively should not be missed. Miell and MacDonald (2000) have also found evidence suggesting the importance of friendship between pairs or groups of student composers creating a supportive environment in which to develop experience in composing. Our own research and analysis of the literature has led us to introduce a small group composing task into the work of students in undergraduate and postgraduate teaching courses in both primary and secondary sectors as it develops a strong sense of identification with the novice composer for the less musically experienced students and a valuable insight into the mechanics and dynamics of the group composing process for the more able and often experienced 'solo' composers.

Interim conclusions

We have endeavoured to present a fair and accurate picture of a sample of views and opinions on inventing in Scottish secondary schools and to attempt to draw some conclusions based on evidence. If our views on open and closed critical-thinking activities in music are to gain any credence with the teaching profession, there need to be clear advantages emerging for the classroom teacher. We have already commented on the pragmatic, examination-orientated syllabus which drives the curriculum and dictates, to a large extent, the shape and content of the teaching and learning year in secondary schools. It has been suggested that without a syllabus, teachers would not willingly opt to teach composing, improvising and arranging in the Scottish secondary classroom. Evidence is emerging from researchers in the SCARLATTI project that many teachers who do not consider themselves to be jazz musicians, are, nevertheless, content to write their own jazz materials for use in the classroom rather than carry out research into the most useful and workable materials available on the market. This homespun approach is bound to raise a series of issues about methodology and adds fuel to the debate about the relationship between classroom music and music of the real world (Swanwick, 1994). Although many more children are taking music at Standard Grade, we have little evidence that the study of inventing is producing the sort of comprehensive musician envisaged by the designers of the new music curriculum. The verb 'to invent', for many young Scots, connotes the tedious task of assembling paper and tape for their assessment folio which, once sent off to the Scottish Qualifications Authority, can be quickly forgotten, allowing the student to concentrate on performing and listening. Students who compose and improvise for the intrinsic reward of so doing are still quite rare.

Teachers are the people who deliver the syllabus, designing appropriate lessons, activities and range of topics which ought to capture the imagination of students. We had wrongly assumed that teachers would tend to bring their own skills and insights of the composing process to the design and implementation of appropriate learning activities in the classroom. Paynter (1982) and Mark (1978) proffered the notion that teachers' lack of confidence and preparedness, as far as creative production was concerned, had a direct effect on the quality of their teaching in this area. We know that comprehension must

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precede production (Vygotsky, 1978) so it would seem reasonable to assume that those who teach inventing have experienced the production of either original or new works in received styles. This, in turn, prepares teachers to teach these skills to their students with a degree of confidence. It follows, from Mark and Paynter, that the more these skills are learned as part of teachers' education and training, the more comfortable they will be with inventing in the classroom. Conversely, those teachers who lack confidence in this area, might be assumed to be less able to teach inventing than their peers who are composers. Our study revealed evidence which contradicts this view.

References

BAMBERGER, J. (1991) *The Mind Behind the Musical Ear*. Cambridge, Mass.: Harvard University Press.

BRESLER, L. (1995) 'Ethnography, phenomenology and action research in music education', *The Quarterly Journal of Music Teaching and Learning*, **6**, 3, 4–16.

BROOKFIELD, S. (1985) 'Self-directed learning: a critical review of research'. In S. Brookfield (Ed), *Self-directed Learning: from theory to practice*, pp. 5–16. *New Directions for Continuing Education no. 25*. San Francisco, CA: Jossey-Bass.

BUZAN, T. (1974). *Use Your Head*. London: BBC Books.

BYRNE, C., & SHERIDAN, M. (1998) 'Music: a source of deep, imaginative satisfaction?' *British Journal of Music Education*, **15**, 3, 295–301.

CANDY, P. C. (1991) *Self-direction for Lifelong Learning*. San Francisco, CA: Jossey-Bass.

CSIKSZENTMIHALYI, M. (1992) *Flow: The Psychology of Happiness*. London: Random House Limited.

CSIKSZENTMIHALYI, M. (1997) *Finding Flow: The Psychology of Engagement with Everyday Life*. New York: Basic Books.

de BONO (1976) *Teaching Thinking*. London: Temple Smith.

de BONO, E. (1982) *de Bono's Thinking Course*. London: British Broadcasting Corporation.

de BONO, E. (1983) *Serious Creativity*. London: Harper Collins.

DeCORTE, E. (1990) 'Towards powerful learning environments for the acquisition of problem solving skills', *European Journal of Psychology of Education*, **5**, 5–19.

DeCORTE, E. (1995) 'Fostering cognitive growth: a perspective from research on mathematics learning instruction', *Educational Psychologist*, **30**, 1, 37–46.

DEWEY, J. (1910) *How We Think*. Boston: Heath.

DEWEY, J. (1966) *Democracy and Education*. New York: The Free Press.

FISHER, R. (1995) *Teaching Children to Learn*. Cheltenham: Stanley Thornes.

GUILFORD, J. P. (1967) *The Nature of Human Intelligence*. New York: McGraw-Hill.

HOWARD, J. (1988) 'Composition in teacher training: some questions and observations'. In W. Salaman & J. Mills (Eds), *Challenging Assumptions: New Perspectives in the Education of Music Teachers*, pp. 29–34. Exeter: School of Education, University of Exeter.

HSDU (1996) *Core Skills: Further Consultation*. Edinburgh: Higher Still Development Unit.

HSDU (1997) *Subject Guide: Music*. Edinburgh: Higher Still Development Unit.

KREBER, C. (1998) 'The relationships between self-directed learning, critical thinking, and psychological type, and some implications for teaching in higher education', *Studies in Higher Education*, **23**, 1, 71–86.

MARK, M. (1978) *Contemporary Music Education*. New York: Schirmer Books.

McGUINNESS, C., & NISBET, J. (1991) 'Teaching thinking in Europe', *British Journal of Educational Psychology*, **61**, 174–86.

MEZIROW, J. (1985) 'A critical theory of self-directed learning'. In: S. Brookfield (Ed), *Self-directed Learning: From Theory to Practice, New Directions for Continuing Education no. 25*, pp. 17–33. San Francisco, CA: Jossey-Bass.

MIELL, D., & MACDONALD, R. A. R. (2000) 'Children's creative collaborations: The importance of friendship when working together on a musical composition', *Social Development*, **9**, 3, 348–69.

PAYNTER, J. (1982) *Music in the Secondary School Curriculum*. Cambridge: Cambridge University Press.

ROSSMAN, J. (1931) *The Psychology of the Inventor*. Washington, DC: Inventors Publishing Co.

SCARDAMALIA, M., & BEREITER, C. (1985) 'Cognitive coping strategies and the problem of ''inert knowledge'''. In: S. F. Chipman, J. W. Segal, & R. Glaser (Eds), *Thinking and Learning Skills, Volume 2: Research and Open Questions*, pp. 65–80. Hillsdale, New Jersey: Laurence Earlbaum Associates.

SCOTTISH CONSULTATIVE COMMITTEE ON THE CURRICULUM (1989) *Curriculum Design for the Secondary Stages; Guidance for Headteachers*. Dundee: Scottish Consultative Council on the Curriculum.

SCOTTISH EDUCATION DEPARTMENT (1977a) *The Structure of the Curriculum in the Third and Fourth Years of the Scottish Secondary School*. Edinburgh: HMSO.

SCOTTISH EDUCATION DEPARTMENT (1977b) *Assessment for All*. Edinburgh: HMSO.

SCOTTISH EDUCATION DEPARTMENT (1978) *Music in Scottish Schools: Curriculum Paper 16*. Edinburgh: HMSO.

SWANWICK, K. (1994) *Musical Knowledge: Intuition, Analysis and Music Education*. London: Routledge.

TORRANCE, E. P. (1965) *Rewarding Creative Behavior: Experiments in Classroom Creativity*. Englewood Cliffs, NJ: Prentice-Hall.

VYGOTSKY, L. S. (1978) *Mind in Society*. Cambridge, Mass.: Harvard University Press.

WALLAS, G. (1926; 1945) *The Art of Thought*. London: Watts.

WEBSTER, P. R. (1988) 'Creative thinking in music: approaches to research'. In: J. Terry Gates (Ed), *Music Education in the United States; Contemporary Issues*, pp. 66–81. Tuscaloosa: The University of Alabama Press.

WEISBERG, R. W. (1986) *Creativity: Genius and Other Myths*. New York: W. H. Freeman and Company.

WOOD, D. J., BRUNER, J. S., & ROSS, G. (1976) 'The role of tutoring in problem solving', *Journal of Child Psychology and Psychiatry*, **17**, 89–100.