Helping To Keep History Relevant: Multimedia And Authentic Learning

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Abstract: The subject based curriculum attracts lively debate in many countries being accused of fragmenting teaching and learning, erecting artificial barriers and failing to teach the skills required in the twenty first century (Hazlewood 2005). Cross-curricular rich tasks are increasingly seen as the means to develop relevant knowledge, understanding and skills. Over the past fourteen years we have developed and evaluated a series of interactive multi-media resources for primary and secondary schools on themes within Scottish History. The generally positive evaluation given to these resources by pupils and teachers points to some ways in which subjects such as history can remain challenging and relevant. The relevance has largely stemmed, in the case of the multi-media resources, from combining the historian's traditional role of problemising the past, with a wide range of primary and secondary sources, new technologies and learning tasks encompassing critical skills/authentic learning. Consequently, we argue that subjects must in future embrace new technologies and authentic learning to maintain their place in the school curriculum.

Keywords: History, subjects, authentic learning, multimedia, curriculum.

Introduction

A key feature of secondary schooling in Scotland has been and remains subject teaching by an all graduate profession. Pupils entering the first year of secondary school experience subjects ranging across the spectrum including English, Mathematics and history to physics and technology. It has often been claimed that primary education is child centred while secondary schools are subject focussed 'examination factories' (Boyd 1997). Nonetheless, the emphasis on subjects transcends national boundaries featuring in countries across the globe from Australia to the United States of America. This has not prevented increasing levels criticism of curricula organised around subjects. Criticisms challenge the philosophical underpinning of subjects and their impact in teaching and learning within schools.

Subjects such as history, it has been argued, 'are actually territorial spaces carved out by academic scholars for their own purpose' in contrast to real life where people, when confronted with a problem, do not ask if it is part of Mathematics, Science, etc. (Beane 1991). This results in an unconnected, fragmented and disjointed curriculum requiring a leap of faith by pupils to see if it fits together as a whole. In announcing a review of the curriculum in Scotland, the Education Minister flagged up his disenchantment with the subject based curriculum (Munro 2003), but this review is only one among similar reforms beyond Scotland such as the New Basics Project in Queensland, Australia, (Department of Education and the Arts 2006) and Opening Minds, the new Curriculum, in England (the Royal Society for the Encouragement of Arts, Manufactures and Commerce 2006 and Hazlewood 2006). Many of these reforms are influenced by the growing body of evidence concerning the impact of problem based learning and constructivist philosophy which place 'the activity students complete as they study at the heart of the curriculum' (Reeves, Herrington and Oliver 2002). Consequently, programs such as the New Basics are built round a sequence of Rich Tasks centred on a challenge or problem with 'real-world value' (Department of Education and the Arts 2004). In bringing together many different disciplines, these tasks attempt to provide an integrated rather than a subject based curriculum. The advocates of this type of curriculum further argue that it prepares young people for a world in which the speed of change is becoming exponential and where 'uncertainty is the only certainty' (Barker and Hazlewood 2005).

Nonetheless, many aspects of this 'new' approach have longer antecedents and have attracted criticism in the past. Integrated, enquiry based curricula and child-centred approaches were much criticised in the 1980s for leading to badly managed classrooms and poor teaching (Poulson 2001) with many of the current debates proving the adage that in education 'revolutions are circles'. This article analyses the criticisms of and proposed alternatives to the subject based curriculum. It argues that there is no innate reason why subjects, in this case history, cannot be effective in meeting the demands of the twenty first century. Problems lie at the heart of history, and the subject must embrace a problem based methodology, but one within the rigour provided by a sound knowledge base (Haydn 1996). The evidence to support these arguments comes largely from the research, development and evaluation of a series of multimedia CD ROMs produced to support the study of Scottish History. These arguments also help to counter concerns over the impact of ICT on teaching and learning in the classroom (Selwyn 1999). This article argues that multimedia and ICT can help keep history relevant in the twenty first century.

The Curriculum, Not Fit For Purpose?

In a disparaging assessment of the curriculum in the lower secondary school, Patrick Hazlewood, Head Teacher of St John's School, Malborough, criticised the 'incoherent jumble of 'subjects' with little planned interconnectivity; repetition, planned or otherwise, is increasingly evident….' The educational diet for today's pupils was little different to that experienced by their parents and grandparents. Furthermore, the curriculum failed to develop the knowledge and skills necessary for the 'information age'. Herein, a constant theme revolved around the potential of ICT to affect learning, the learning environment and equality of access (Hazlewood 2005).

Implied criticism of the existing curriculum lies behind the New Basic Project in Queensland which aims to:

> *'…. empower and encourage teachers, unclutter the curriculum, up the ante intellectually, deliver fewer alienated students, prepare students for a future in an uncertain world, and position the classroom within the global village'* (Department of Education and the Arts 2004).

In Scotland, concerns about the relevance and structure of the curriculum led the Scottish Executive to establish a review group in 2004 which produced a report entitled, A Curriculum for Excellence. The aims of the reform, as outlined in this report, bear more than a passing similarity to that in New Basics. These include reducing fragmentation, encouraging intellectual skills and connecting the various stages of learning (A Curriculum for Excellence 2004).

Across different countries and education systems, the remedies for the perceived curriculum malaise bear more than a passing similarity since they espouse a competence based curriculum, integration and authentic problem-solving learning. Beane's version of middle schools in America was for a curriculum organised round 'rich and provocative themes' rather than abstract and artificial subjects. These themes included Identities, Living in the Future and Wellbeing to develop skills encompassing problem solving, computation, communication and research (Beane 1991). The New Basics Project is built around the three pillars of productive pedagogies, such as problem based learning; the curriculum organisers of citizenship, life pathways, multi-literacies, environment and technology alongside a sequence of rich tasks drawing on multi-disciplinary knowledge and skills (Queensland State Education 2004).

The advocates of reform further agree that the curriculum should be based round competences rather than subjects. The competences in opening minds relate to learning, citizenship, managing information, relating to people and managing situations. These competences divide into several categories. Learning encompasses understanding how to learn, learning to think systematically, learning to enjoy learning, understanding and using creative talents set within high standards in literacy, numeracy and ICT (Royal Society of Arts 2006). The Curriculum for Excellence programme in Scotland outlined four purposes of the curriculum with successful learners, confident individuals, responsible citizens and effective contributors. Using similar terminology to Opening Minds, A Curriculum for Excellence subdivides learning into categories including enthusiasm for learning, high standards, literacy, numeracy and communication, use of technology and thinking creativity (Curriculum for Excellence 2006). The practical working out of these reforms downplays subjects which suffer further ignominy in being linked to the new right (Rauling 2000). By way of contrast, the competence led curriculum develops integrated modules which in Queensland begin in Year 1 with webpage design where students collect information about themselves, their school and their community using that information to design web pages. The tasks culminate in Year 9 with International Trade where pupils

carry out a detailed analysis of an export opportunity taking advantage of their skills in a language other than English to present a talk and supporting literature to promote the export opportunity to different subjects and backers (Department of Education and the Arts 2004).

These and other similarly integrated tasks (Bosher and Hazlewood 2005) demonstrate many of the key characteristics of authentic learning/critical skills whereby pupils engage with real life challenges within an experiential learning cycle (Weatherley, Bonney, Kerr and Morrison 2003). Each challenge features:

<!--[if !supportLists]-->• <!--[endif]-->real world relevance;

<!--[if !supportLists]-->• <!--[endif]-->complex tasks to be investigated by students over a lengthy period;

<!--[if !supportLists]-->• <!--[endif]-->opportunities to examine a task from a variety of perspectives;

<!--[if !supportLists]-->• <!--[endif]-->collaborative working;

<!--[if !supportLists]-->• <!--[endif]-->reflection on the task;

<!--[if !supportLists]-->• <!--[endif]-->interdisciplinary perspectives;

<!--[if !supportLists]-->• <!--[endif]-->integration of assessment;

<!--[if !supportLists]-->• <!--[endif]-->production of high quality products (Herrington, Reeves, Oliver and Woo 2004, Lebow and Wager 1994).

Tasks such as International Trade cut across subject boundaries, but there is no reason per se why a subject discipline such as history should not incorporate authentic activities. Furthermore, one danger of authentic learning/critical skills is that skills are decontextualised from an essential knowledge base. For example, without an understanding of certain historical events a person will be unable to evaluate competing theories regarding the causes of World War One (Bailin, Case, Coombs and Daniels 1999). Moreover, some activities that claim to be relevant for integrated social studies are often an intrusion of language arts… into social studies'. Alleman and Brophy (1993) contrasted a social studies assignment in which students wrote asking political representatives about their roles in government with a language exercise wrapped up in social studies when students described an imaginary visit to the White House.

The Rich Tasks represent the culmination of three years engagement with New Basics. Schools 'backward map' from the Rich Tasks to construct a three or four year curriculum plan and in each Rich Task the targeted repertoires of practice indicate skills and knowledge required for successful completion. Consequently, students engage in a range of learning experiences that are preparatory to the Rich Tasks and, as a general rule, secondary schools take a disciplinary approach to this work. Moreover, some modules within the Opening Minds programme contain distinctive historical themes. Being Unique includes history in the form of the use of evidence, Mark Pullen, Bog Bodies, Tollund Man, Tutankhamun – theories, reconstruction, analysis with presentations by pupils. These themes could be found in more traditional history courses. Consequently, it appears as if integration depends to some degree upon subject disciplines to impart the necessary knowledge and skills. Conversely, this article argues that subjects are well placed to develop the attributes advocated by the proponents of authentic and problem based learning, especially within a multimedia environment. This environment operated within changes to the teaching and learning of history in and beyond Scotland.

History Education, an Opportunity for Multimedia

Many of the recent changes to History Education trace their origins back to the late 1960s and early 1970s with criticisms of didactic teaching methods which made the subject '... excruciatingly, dangerously dull, and what is more little apparent relevance' (Price 1968). Fairley (1970) labelled the teaching of history in Scottish schools as a 'desperate race through the centuries to examine fleetingly the vicissitudes of fortune that befell an interminable procession of Kings, Barons and Archbishops (which) often provided the school learner with nothing beyond a set of imperfectly understood facts and ill digested notions'. The way ahead for history lay in a more varied pedagogy employing an active, investigative and problem based approach using primary and secondary sources (Fairley 1967).

These approaches are now embedded in syllabuses from primary through to the final stages of secondary school. The 5-14 programme in Scotland sets out general curriculum guidelines from primary 1 to secondary 2. Enquiry skills in Environmental Studies, which encompasses history, include the following features:

<!--[if !supportLists]-->• <!--[endif]-->Preparing for tasks - plan a sequence of activities for tackling an enquiry …;

<!--[if !supportLists]-->• <!--[endif]-->Carrying out tasks - select and record a range of relevant information from a variety of different types of resources;

- make judgements about what evidence is relevant and reliable

<!--[if !supportLists]-->• <!--[endif]-->Reviewing and Reporting on Tasks - present an extended report (orally or in writing), showing a clear and coherent argument or analysis. (Learning and Teaching Scotland 2000)

In Standard Grade, the national course for pupils opting for history in Secondary years 3 and 4, pupils evaluate 'sources with reference to their historical significance, the points of view conveyed in them and to the relevant historical context' (Scottish Qualifications Authority 1997). As its name suggests, Advanced Higher sits at the top of history courses with its aims of acquiring depth in the knowledge and understanding of historical themes and developing skills of analysing issues, developments and events, drawing conclusions and evaluating sources …. The course will also 'provide the opportunity to integrate these skills in an extended piece of individual research' (Scottish Qualifications Authority 1999).

A growing body of literature supports these approaches. History by its very nature presents challenges and problems not least in deciding what should be taught. Lee (1991) argues that 'real historical knowledge involves knowing the grounds for claims to knowledge in history'. Learning about the past 'means learning about the discipline too' moving history beyond memorising key dates and events to involve students in using primary sources (Seixas 1998). These in turn lead into many other avenues of enquiry which help capture pupil interest, the letterhead, handwriting, notations, colour and size (Potter 2005). The same author also describes how even the notes on the reverse sides of historical documents can open further avenues of enquiry. Nineteenth and early twentieth century United States government documents were tri-folded and their reverse sides often contain details of who received the document, when it was received, a brief summary of the key points and comments (Potter 2004). Nonetheless, in parallel with concerns over the danger of a lack of a knowledge base in critical thinking (Bailin, Case, Coombs and Daniels, 1999), Hutchison (2005) argues that historical topics such as the American Civil War and the associated primary sources enhance both knowledge and skills:

> *'In this bottom up approach to learning history, students acquire a better understanding and appreciation for what is being covered because in essence they are able to find themselves in the past. Once the connection is established, research and learning takes precedence over questions about relevance…. The desire to find out information supersedes all else'.*

The records of the past present history teachers with diverse and rich resources from artefacts, autobiographies, the census, film, photographs, music and song through to newspapers and radio. Nonetheless, difficulties can arise in collecting and managing this diversity in the history classroom which creates an opportunity for multimedia CD ROMs to provide 'teachers and students with invaluable resources unavailable (in a practical sense) to them in conventional modes of teaching' (Schick 1996). For multimedia to be truly interactive, it must do more than present sources linked to drill and practice routines. Instead, it must offer examples of how a historian would go about presenting or solving a problem. The purpose of interactivity 'is to get inside students' heads, to encourage them to think differently, and apply those insights on new problems' (Schick 2000).

Resources which combine problem solving, historical sources and multimedia have the potential to enhance the teaching and learning of history against a backdrop of increasing scepticism about ICT in schools. According to Oppenheimer (1997) there was no good evidence that most uses of ICT significantly improve teaching and learning with any improvements resulting from project orientated learning, which often

accompanied computer based learning, rather than the new technologies themselves. Conlon (1999) criticised exaggerated claims made by the advocates of ICT, most notably a failure to be uncritical, making misleading claims, fixating on skills and asserting that ICT turned teachers from sages to guides. By way of contrast, Wild (1989) argued that in certain situations the relationship between pupil and teacher changed so that the teacher became a facilitator rather than the main source of knowledge. Further advantages of ICT lay in the encouragement to independent learning and a problem based methodology.

The position of ICT in classrooms tends to support a more sceptical view of deployment and employment (Selwyn 1999). ICT co-ordinators in Scottish primary and secondary schools identified ten obstacles to the greater use of new technologies. These ranged from too many other priorities competing for staff time and attention, to not enough relevant curriculum materials (University of Strathclyde and Northern College of Education 2000). Outside Scotland, Cuban (2001) isolated more fundamental reasons behind ICT's failure to transform teaching and learning within Silicon Valley in stark contrast to claims made by politicians and educational administrators. At the root of this failure lay a 'top down' model of implementation which excluded teachers from central decisions regarding the disposition and use of new technologies.

Theoretical and practical considerations provided a fertile backdrop for the series of CD ROMs on Scottish History. Changes to History Education opened the door to resources which utilised primary sources within an interactive environment at a time when the basis of a subject based curriculum was being challenged. Could our CD ROMs help provide evidence that subjects such as history can meet the demands of the so called knowledge economy? The answer lay in a combination of new technology, traditional historical sources and an authentic/problem based methodology.

The Multimedia CD ROMs

Over the past fourteen years we have produced multimedia CD ROMs on themes relating to some of the major social and economic trends in the nineteenth and twentieth century Scotland, notably, Highland clearance, industrialisation and urbanisation. We are currently working on an eighth CD ROM examining changes in lowland rural Scotland using as a base the journal kept by a farmer in Banffshire between 1879 – 1892. The other programs are:

Moving House (1993) which analyses increasing social segregation in nineteenth century Glasgow;

Tiree, Famine and Clearance 1840 - 1900 (1996). The Highland Clearances are often presented as a uniform sequence of changes but this hides considerable regional variations. The small island of Tiree provides a case study into Highland Clearance and subsequent emigration to Canada;

Glasgow, A Tale of Two Cities (1999). Rapid industrialisation and urbanisation led to increasing disparities of wealth and living conditions. These disparities provide the context for this CD ROM examining contrasting lifestyles;

Auld Reekie and The Dear Green Place (2001). This develops many themes within *A Tale of Two Cities* to compare life in Edinburgh (Auld Reekie) and Glasgow (The Dear Green Place) in the nineteenth century;

Changing Scotland, Scottish Society 1880 – 1939 (2003). Industrialisation and urbanisation changed many aspects of Scottish society from education and housing to religion and sport. *Changing Scotland* allows pupils to examine how these and other aspects of life in Scotland changed between 1880 – 1939;

Barnhill (2005). The film *Oliver* helps shape many perceptions of Victorian society, but Barnhill presents the reality of poverty and the workhouse. Barnhill, the largest Poorhouse in Scotland, provides pupils with a case study into a central response to the growing numbers of poor in urban Scotland.

The aim of providing teachers and pupils with a wide and diverse range of primary sources lay behind research, design and development as illustrated by *Auld Reekie and The Dear Green Place* and *Barnhill*. Census databases run as a spine through each program: the 1851 and 1891 censuses in *Auld Reekie* to allow a comparison over time; the 1881 census in *Barnhill* provides information on the 'officers' and 'inmates' in the Poorhouse. Although the censuses only provide a snapshot of the population in a given day, they remain an invaluable primary source giving unique and fascinating insights into society. An indication of standards of living is provided by age profiles in different parts of each city; the recording of occupations highlights

diverse and varied employment opportunities in the wake of industrialisation and urbanisation; surnames point the way to patterns of migration with more detailed evidence contained under places of birth while 'rooms with one or more windows' indicates both property type and locality. Held within a database, census information helps pupils discern socio-economic trends and follow, as will be discussed more fully in the article, the key historical process of framing questions, researching for answers and presenting findings.

Auld Reekie and The Dear Green Place takes different streets in each city as case studies into contracting lifestyles. Royal Terrace whose residents read as a 'who's who' of Edinburgh Society (Mitchell 1993), contrasted with the Cowgate, a working class slum area with Sandyford Place, Malta and Norfolk Streets representing 'rich' and 'poor' districts in Glasgow. The 'virtual' entrance to these streets comes via the 1896 Ordnance Survey map whereby clicking on a property brings up a menu of information, depending on the traceability of sources, including photographs and profiles relating to the head of the family, photographs of the property and the census returns for 1851 and 1891. Census data is held within a V12 search engine allowing fast, single and multiple field searches, such as for all servants born in Ireland.

Information in the census points the way to avenues for further investigation, for example, a search for 'children under the age of twelve' leads into education and 'age greater than 55' into life expectancy/health and housing. These and other avenues for investigation form the basis of chapters within the program. Chapters begin with Teacher Notes covering the historical context, explanations of the program, suggested follow up activities including field studies and detailed outlines on how each chapter links to the national 5 – 14 programme. Most chapters, however, relate to historical themes such as health and housing, a servant's life, education, clothing and religion. These chapters hold a plethora of primary sources notably photographs, film, drawings, autobiographical accounts, newspapers, advertisements, music, maps, diagrams, menus and recipes such as those found Beeton's Everyday Cookery (1907). Explanatory text links these sources and sets each within the overall theme.

In planning the early CD ROMs considerable discussion took place around the inclusion of student tasks. Concern was expressed that these could restrict how teachers used the resources, but excluding such tasks limited the scope to develop knowledge and skills. Moreover, the real world of the primary school classroom demands that teachers cover the whole curriculum necessitating appropriate support. Consequently, the programs, including *Auld Reekie and the Dear Green Place*, incorporate a range of student tasks with an accompanying folder containing paper based supporting activities. These 'on' and 'off' computer based tasks aim to develop knowledge and skills. Therefore, pupils complete various written tasks building to extended accounts, critically evaluate evidence, discuss and debate central issues, recreate the past through drama, imagine themselves as people in the past, devise, carry out and report on questionnaires, make decisions about areas for investigation; carry out the necessary research and create a wide variety of art and craft based resources, to name but a few of the activities within *Auld Reekie*. The program also contains 'interactive' boxes into which pupils type their answers/findings.

Barnhill includes a similar series of primary sources with the census databases covering the Poorhouse itself alongside Girvan and Luss where children were boarded out. These sit alongside film, photographs, contemporary accounts and other similar sources. Taking its cue from authentic learning/critical skills, the program concludes with the Barnhill Challenge in which pupils are presented with a scenario set in 2080 when building work on the site of the old Poorhouse revealed artefacts from the nineteenth century. These artefacts included the remains of a bread oven, a suitcase, child's cot, school desk, long dining table and hammer used to break stones. Pupils are called in to investigate as teams of archaeologists with links provided to websites such as TimeTeam (http://www.channel4.com/timeteam) to provide guidance and support. The scenario then develops into the opening of a new museum of social work which wishes to display three recently discovered artefacts from Barnhill. Teams of pupils must prepare a presentation to convince a panel of experts, in this case the Head Teacher and the local librarian, to display three artefacts which each team considers best illustrates life in a Poorhouse. Presentations must also set the Poorhouse in its wider context of the nineteenth century. Authentic learning aims to integrate assessment into the challenge and in this case pupils have to complete an evaluation sheet for the panel of experts to use when judging each presentation. Completion of this assessment sheet involved decisions regarding the criteria for an effective presentation, logical order, clear voice, and other similar features, which were then listed on a given template for comments by the panel under each criterion. Consequently, assessment and feedback came via a format largely devised by pupils supplemented by two 'positive' and one 'negative' observation from the class after each presentation. However, this represented only one of several ways in which teachers and pupils have used the CD ROMs.

(VIDEO CLIP COULD GO HERE)

In the Classroom

Teachers and lecturers have used the CD ROMs in more diverse and varied ways than was envisaged when they were produced. In most cases the relevant program supported the associated topic, for example, *Auld Reekie and the Dear Green Place* linked to the Victorians and *Changing Scottish Society* linked to the impact of industrialisation and urbanisation. In these instances, pupils were drawn from the target audience, upper primary for *Auld Reekie* and upper secondary for *Changing Scottish Society,* but schools have also used the programs as part of different topics to the original historical context. Tarbert, a small fishing and tourist village on Loch Fyne, holds a sailing regatta each September with the local high school using this to support a study into how tourism affects the local area. Tarbert features as a case study in *Doon the Watter* and the CD ROM helped form the basis of a comparative study into tourism past and present. Other schools used appropriate sections of the program to support a River study. 'The program was used', noted one school, 'as an additional multimedia tool and database to enhance a study of Rivers and how they have changed. The whole program was therefore not completely relevant'. In a school located close to the River Clyde, the program gave information about Govan shipyards and details of Clyde Ferries for a tile display which has the Clyde as a theme.

When using the CD ROMs, teachers organised classes in different ways largely determined by computer provision. Computer suites allowed a whole class to work on the program at the one time. One teacher reported that this 'made it easy to organise the work for either individuals, groups or the class.' The suite also helped the teacher explain and discuss sources such as the census database to the whole class rather than repeatedly to different groups:

> *'The children all worked in pairs with their own CD's in the computer room, which has 14 i-macs. I would give an introductory lesson, then the children would open up their CD's and carry out the tasks.'*

In a similar manner, a smartboard facilitated explanations of 'how to use the CD ROM *Changing Scottish Society* to the whole class at the start'. Other schools could work in a similar way with a trolley based laptop system allowing pupils to work in pairs. Nonetheless, the most common method of organisation resulted from two or three computers in the classroom with groups or pairs of pupils moving to and from the computers to complete a specific task while other pupils worked on a related piece of work, often printed from the CD ROM:

> *'There were 2 to 3 pupils working together on the same program at 3 computers. After twenty minutes they changed over. I have 32 in the class, this was the only way I could organise each session to ensure as many pupils as possible could take part.'*

Most groups were organised on a mixed ability basis:

> *'The class was arranged in mixed ability topic groups. These groups then worked at the computer together where children who are more capable readers helped others.'*

The CD ROMs provided a central but not the sole resource within the topic. Other resources encompassed video, newspapers, photographs, paintings and fiction. Class and school libraries provided books either for periods of silent reading in class time or home reading. Popular examples were books by Fidler (1984) and Updale (2004). Where the program supported topics such as the Victorians they were allocated two afternoons a week for one term.

Artefacts allowed pupils to handle real objects with some, notably, coins, lace, photographs and irons, begged or borrowed from home. These stimulated discussions over a purpose, method of working, the people who would have used specific implements and present day comparisons (Wallace 2003). In a similar vein, teachers and pupils supplemented the suggested activities within each CD ROM with rich tasks, especially those based on art work and field studies. One school used *Doon the Watter* to generate ideas and images for a display covering two sides of the classroom with life-sized drawings of children fishing off a pier fronting a

seaside scene surrounded by drawings and photographs of people enjoying their holidays. Pupils designed and wrote imaginary postcards from holidaymakers, made up menus for the very elaborate dinners served to first class passengers and made holiday hats from papier-mâché. Many people in Victorian Glasgow bought two hats during the year, one for the New Year and another for the Glasgow Fair holiday. *Barnhill* supported similar activities, notably a hand sewn frieze depicting the Poorhouse. The programs therefore embed tasks which exploit both computer and non-computer based activities. One teacher summed up the benefits accruing from these types of activity such as the frieze:

> *'Apart from the computer the children have enjoyed the work and the technology. They enjoyed working together in groups and they enjoyed problem solving as to how to make the range and make the frieze figures …. I think that tells us something as teachers since students are looking for challenges – looking for opportunities to use those skills and to work together. I think this is a very positive reaction from them.'*

This evaluation of the supporting activities leads into the more detailed pupil and teacher evaluation of the CD ROMs.

Evaluations

Pupils' and teachers' evaluation of various aspects of each program was gauged through questionnaires, interviews, co-operative teaching with the author and class teachers combined with production of DVDs showing pupils working with the CD ROMs. This article analyses the results of pupil questionnaires completed by ninety two pupils aged 11 and 12 years and three teachers using *Auld Reekie* and *Doon the Watter*; fifty nine pupils aged 11 and 12 years and two teachers for *Barnhill* and twenty four pupils aged 16 and 17 and their teacher who used *Changing Scottish Society*. Questionnaires and selected follow up interviews covered several areas, but this article focuses on:

<!--[if !supportLists]-->• <!--[endif]-->general reaction to the CD ROMs;

<!--[if !supportLists]-->• <!--[endif]-->evaluation of the resources included in each program;

<!--[if !supportLists]-->• <!--[endif]-->impact on knowledge and skills;

<!--[if !supportLists]-->• <!--[endif]-->impact on teaching and learning;

<!--[if !supportLists]-->• <!--[endif]-->specific evaluation of the Barnhill Challenge.

Pupil questionnaires asked a range of questions beginning with the sections and resources in the relevant program which had been studied. Pupils then evaluated each resource and explained the reason behind, for example, regarding the census database as the most helpful resource. Subsequent questions addressed the learning tasks, apart from the over-arching authentic challenge which had a separate series of questions, advantages and disadvantages of the program and the ways in which it developed their knowledge and understanding of the topic. Finally, pupils rated on an eight point scale improvement in skills such as using a database. Questions on the challenge covered reasons for the choice of artefacts, presentation method and individual roles from planning, through to giving the presentation. Further questions focussed on how the challenge enhanced knowledge, understanding and skills such as looking for information. This led onto pupils rating on a five point scale, the ways in which the assessment had supported preparing and giving a presentation.

Figures 1, 2 and 3 show three pupils' comments from the first page of the questionnaire for *Barnhill*:

Figure 1. Pupil Comments on Barnhill

Figure 2. Pupil Comments on Barnhill

Figure 3. Pupil Comments on Barnhill

The eleven part teacher questionnaire began with questions on the program's ease or difficulty of use, reasons for choice of sections and impact on teaching and class organisation. Teachers were asked to comment on positive and negative pupil reactions to the program and its impact on knowledge, understanding and skills. The final questions covered future changes to how the program would be used and the effectiveness of the authentic challenge. Interviews with pupils and teachers were conducted throughout the topic with teachers asked to comment on how the program was being used in the classroom, impact on teaching and learning and pupil reactions. Pupils were asked questions on some of the historical issues, for example the treatment of the poor and how the past compared to the present, their role in group tasks, the advantages and disadvantages of sources such as the census and their general reactions to the program.

Evaluations were carried out by one of the authors who, despite having a vested interest in positive results, used criticisms to amend subsequent programs and argues that the overall results highlight some general conclusions regarding ICT and the curriculum.

Pupils

Changing Scotland proved less popular than other CD ROMs with thirty percent of pupils claiming not to have enjoyed the program. The most common reason related to taking 'time away from examination revision'. 'I have missed out' noted one pupil, 'on revision time due to this and find books easier to use'. These negative comments may have partly resulted from timing since pupils studied the topic at the end of the course. It will feature earlier in future courses further away from the looming presence of the examination. Positive comments unanimously made reference to variety and pace of learning:

> *'(the program) makes a change to the normal reading and writing answers. Provides variety and you can do it at your own pace'.*

Of the ninety two pupils evaluating *Auld Reekie,* ninety three percent stated that they had enjoyed working with the CD ROM citing reasons such as it 'helped you learn', 'showed you about Glasgow and Edinburgh' and 'you could find information':

> *'it was fun and it showed what the Victorians in Glasgow and Edinburgh lived like'.*

Criticisms included the program being 'boring', 'having too much to read' and 'not being into that particular topic':

> *'I did not enjoy it (Doon the Watter) because it is not what I am interested in stuff like the Clyde, paddle steamers and the olden times'.*

Others were more equivocal:

> *'it was quite interesting finding out different things but other times it could be quite boring'.*

Teachers, to some extent, mirrored the criticism of 'having too much to read', with one noting that pupils did not enjoy 'any page with too much script they were impatient to continue and reluctant to take the time to read it'. In designing and writing these programs, the authors tread a fine line between maintaining in as much as possible the integrity of sources, including challenging texts for more able pupils, providing for those requiring more support and including a hyperlinked glossary of words and phrases. The possibly imperfect solution has been to record an increasing number of sources in successive CD ROMs. Every extract from the farmer's journal in the latest program was recorded by an actor born in the same area as James Wilson, but with a toned down north east Scotland accent!

In *Auld Reekie* and *Doon the Watter*, the most commonly studied primary sources were film, photographs, census databases, drawings, maps and first hand accounts. A similar pattern emerged in the evaluation of *Changing Scottish Society* where seventy four percent of pupils rated the census database as the most useful source in studying the effects of urbanisation. Fifty six percent rated film, and forty nine percent the first hand accounts as the most useful sources. The reasons given for these ratings demonstrated that pupils understood the merits of primary sources. Film, 'almost takes me back in time so it made life at the time easier to imagine'; First hand accounts, 'well if you had to ask anyone about life in the past it would be the people living then'; Census databases, 'when I used *Doon the Watter* I used the database to find out where people lived and it told me what sort of people lived in different houses …'. This had a personal relevance for one pupil who 'went into the database to see who was living in my house at that time'.

Each CD ROM contains a wide variety of tasks alongside possible associated activities such as visiting part of the local area built by the Victorians. Within the programs, searching the database was attempted by every pupil while a related field study and compiling a wall display were the most common associated activities. Pupils rated highly the benefits of their wall displays: 'because a wall display shows you what it was like', and 'because (it) allowed us to put our work together'.

The CD ROMs require and aim to develop a wide variety of skills from using a database to writing answers to questions. Table 1 shows the number of pupils in three schools giving improvement in a particular skill the

top two ratings.

Table 1 Skill Improvement

Skill	School, CD ROM, Number of Pupils		
	A. Doon the Watter N = 30	*B. Auld Reekie N = 32*	*C. Barnhill N = 28*
Searching a database	14	17	16
Using a computer	13	12	12
Working by myself	4	7	6
Using a map	2	4	2
Working as part of a group	2	7	2
Looking for in information	5	2	7
Writing answers to questions	1	3	1
Reading	5	10	4

These figures illustrate a consistent thread running between the primary sources, notably the census databases, the activities and pupils' perception of skill improvement.

Looking for information, searching the databases and working by myself/part of a group came under the umbrella of research and independent learning. This was highly valued by pupils:

> *'It (Auld Reekie) made me have good information for my research';*
>
> *'It was more fun than sitting listening to the teacher telling us things, we could find out what we wanted';*
>
> *'I could look at what I wanted and it was easy to find'.*

However, it is important to emphasise that since the CD ROMs were one, albeit the central resources, it is difficult to isolate ICT as the sole factor in relation to skills such as reading. A similar difficulty emerges when trying to gauge enhancements to knowledge. Nevertheless, only four pupils could correctly identify before working through *Changing Scottish Society* five ways in which industrialisation and urbanisation effected Scottish society. At the end of the unit every pupil could list five consequences and, while the CD ROM was not the only source, it was main provider of information. In a similar finding, pupils could list five key features of life in Victorian times after working through *Auld Reekie*, but claims which attribute this to ICT must be tentative as textbooks and other resources supplemented the CD ROM.

A separate section in the questionnaires on *Barnhill* evaluated the challenge to gauge the impact of this critical skills activity. Pupils worked either in pairs or groups of three with the nurse's uniform, suitcase, basket and desk the most commonly selected 'artefacts'. 'We chose these', recorded one pupil, 'so people could see that children were boarded out and that there was a school in Barnhill'. The increasingly ubiquitous powerpoint provided the means to give the presentations with pupils engaged in the following multifarious tasks:

<!--[if !supportLists]-->• <!--[endif]-->animating the sequence;

<!--[if !supportLists]-->• <!--[endif]-->checking the order;

<!--[if !supportLists]-->• <!--[endif]-->choosing artefacts;

<!--[if !supportLists]-->• <!--[endif]-->choosing background colour;

<!--[if !supportLists]-->• <!--[endif]-->choosing sound effects;

<!--[if !supportLists]-->• <!--[endif]-->deciding on fonts;

<!--[if !supportLists]-->• <!--[endif]-->gathering information;

<!--[if !supportLists]-->• <!--[endif]-->looking for information on the internet;

<!--[if !supportLists]-->• <!--[endif]-->selecting pictures;

<!--[if !supportLists]-->• <!--[endif]-->speaking;

<!--[if !supportLists]-->• <!--[endif]-->typing information onto the slides;

<!--[if !supportLists]-->• <!--[endif]-->writing the presentation.

An open-ended question asked pupils to note the ways in which the challenge helped improve their knowledge of life in a Poorhouse with answers clustering around the theory underpinning authentic learning/critical skills, as characterised by the following statements:

> *'It made me think more and then you will know more':*
> *'We had to find out more for our presentation and we found out different things';*
>
> *'It helped improve my knowledge because it helped me challenge and give answers to different questions';*
>
> *'It made me really think about being boarded out and the school etc';*
>
> *'It was fun so I wanted to learn more'.*

The Challenge integrated assessment with the task since pupils devised an assessment form for judging each presentation. The form gave categories such as Quality of the Preparation and Quality of the Presentation under which pupils had to compose appropriate criteria, for example, 'speaker used a clear voice'. The panel used the assessment form to judge each presentation. Pupils were asked to evaluate how drawing up the assessment form supported planning, preparing and giving the presentation with Table 2 demonstrating that it helped pupils clarify their roles and the content for the presentation.

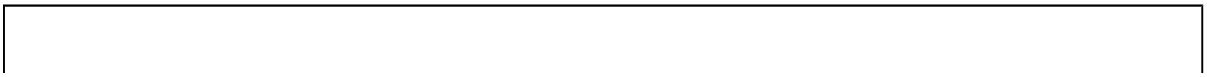

Table 2 : percentage of pupils (n=59) giving the top two ratings to devising assessment criteria	
Aspects of Devising Assessment Criteria	Percentage
Helped me to know exactly what to do	88
Helped me decide what to put in the presentation	68
Helped me know what the audience was looking for in the presentation	22
Helped me practise before giving the presentation	2
Made me work harder	0

Finally, all but eight pupils stated that the challenge had been very successful in helping them learn about life in the past.

Teachers

The generally positive pupil comments were echoed by their teachers. On a scale from 1 (very enthusiastic) to 5 (did not enjoy) teachers gave the CD ROMs either 1 or 2 in terms of pupil enjoyment. This largely resulted from the sources within each program since pupils enjoyed 'using the database. Comparing then and now pictures (particularly Helensburgh) and watching films'. Another teacher noted that her pupils enjoyed 'the film extracts, pictures and songs based on Glasgow'. These primary sources 'helped pupils see how time effects change'. In another school, *Doon the Watter* showed 'the value of evidence in investigations' and 'selecting appropriate information'. However, the most common observation regarding skills concerned the database which 'increased keyboard skills' with pupils becoming 'more familiar with using a database/carrying out searches'. This was noted by every teacher except one since 'many pupils use computers at home and we have a structured computer program in school, therefore actual skills now learned were few, but it did reinforce existing skills'.

The CD ROMs influenced the teacher's role by supporting independent enquiry based learning. According to a teacher, 'one of the most important parts was the experience of teacher and pupil learning together about the topic. Pupils polished their research skills'. *Auld Reekie* brought 'a new dimension to research which the children had not experienced in school before. They found it enjoyable and interesting. This enhanced their enthusiasm for the topic'. In a similar manner, *Doon the Watter* 'increased research skills, organisational skills and presentational skills' while 'a group of children, when set a task, could work well together with the minimum of teacher input'. Teachers did not view this as in any way detracting from their role. Their role changed but not to the detriment of teaching and learning. Nonetheless, independent learning had its limits and teachers required carefully to monitor pupils' work. One teacher noted: 'sometimes they need help in actually coming to some conclusions with the information that is on the computer. They make assumptions very quickly, have reasons for things happening which might not be the correct ones so just leading them through that a bit more carefully'.

These comments were repeated in another school: 'the accuracy of the content in some cases highlighted a need for research to be more thorough and more closely monitored by the teacher to achieve a greater understanding of the period'. This supplemented the more traditional roles from preparation through to reporting on pupil attainment.

Teachers were unanimous in saying that they would use the CD ROM in future years, but with modifications:

> *'In using (Barnhill) again I would narrow the topic area to be covered, perhaps focus on life in Barnhill and link to Boarding Out as this was particularly relevant to the age group using it and the area of the school to Luss. This would hopefully lead to a greater knowledge of the period and lifestyle'.*

This evaluation typified most comments and it may be the case that the CD ROMs are too ambitious in the areas covered although they were intended as a menu from which teachers could chose relevant parts. Other negative comments related to technical problems running the program on a network and the inability to save notes. The networking problem stemmed from the installer with the program which pointed 'running the program' to the CD ROM but then was re-coded to point it to the network drive. In *Changing Scottish Society* notes are saved to a separate folder on the user's hard drive created when installing the program. Overall, however, the generally supportive evaluations encouraged the research and production of subsequent

programs.

Conclusions

The research, design, development and evaluation of the CD ROMs took place against the backdrop of subjects being criticised for being territorial spaces, 'limiting our access to broader meanings' (Beane 1991) and claims that they hinder pupils developing the skills needed for the twenty first century (Bosher and Hazlewood 2005). This study suggests that these criticisms are not necessarily the inevitable consequences of studying a subject such as history especially when it draws on and develops a wide variety of skills, particularly in the new technologies, to enhance its relevance. This is no radical departure in that the effective teaching and learning of history has always done more than develop subject knowledge. A history essay draws on many skills from analysis to synthesis.

Evaluation of the CD ROMs suggests some pointers to the future. It would have been theoretically possible to present pupils with the individual examples of the sources contained in each program. While it is important that pupils handle artefacts and sources such as the census in the 'raw', multimedia provides a more manageable and sophisticated format. It would take a considerable length of time to search through enumerators' returns looking for everyone born in Ireland, whereas a database performs the task in seconds. Moreover, the multimedia format motivated pupils to learn and related to 'their' world. As one teacher noted:

> *'I would always choose to work on a computer based topic because of the wealth of information, pictures etc all contained on a CD ROM. It also increases pupils' IT skills and equips them for the world in which <u>they</u> live'*

However, it is important that multimedia moves beyond providing a repository for primary and secondary sources. The potential is realised when it draws on enquiry methods learning utilising investigations, critical skills and authentic learning, History with the puzzle and the intellectual satisfaction of 'finding out'. *Doon the Watter* helped one pupil learn about the past 'because of the good research and the database … I looked at how people spent their time on holiday. I looked at how people got entertainment like from bands at the band stand. I used the pictures and video to gather information on how people got there and what they did there'. Here lies a powerful justification for teaching history, not that it changes society, but as Lee (1992) argued, 'it changes *pupils*; it changes what they see in the world, and how they see it…. To say that someone has learnt history is to say something very wide ranging about the way he or she is likely to make sense of the world'.
In each program the design of tasks exploited the potential of technology, but the process also worked in reverse with the technology opening up new and more sophisticated lines of enquiry. Multimedia drew the pupils in to explore, enquire and investigate. Authentic learning/critical skills enhanced these processes fulfilling its potential to present 'real life' challenges. Moreover, historical knowledge anchored authentic learning in a context providing pupils with a scaffold on which to develop further knowledge and a wide range of skills. This avoided the potential pitfall in critical skills of decontextualising the tasks. History, therefore, provides an ideal mode for developing pupils' skills of enquiry through the use of ICT and of ICT in terms of information literacy, a crucial skill in today's world (Moore 2000).

The authors would not claim that their arguments negate alternative ways to organise either subjects or authentic learning. With appropriate support in the form of resources and training, subjects provide a flexible platform to develop the skills required for the twenty first century. In his final comment on *Auld Reekie,* one pupil noted that he wanted to give the program 9 out of 10. The developers of multimedia need no more encouragement.

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