CAN MULTIMEDIA RESPOND TO THE CRITICS? A REPORT FROM THE HISTORY CLASSROOM

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INTRODUCTION

Early proponents of computers in the History classroom argued that these new technologies would enhance if not transform teaching and learning. In an analysis of census datasets, Munro claimed that 'there are powerful learning advantages to be gained from the use of such packages. Their use has developed information skills ... has stimulated the investigation of localities and has helped many students appreciate the concept of change'.[1] McArthur described how pupils used a dataset for the 1881 census to answer a range of questions covering occupations, places of birth and number of people living at a given address. Pupils then reported their findings to the class.[2] Wild made more radical claims with computers altering relationships in the classroom whereby the teacher would become a facilitator rather than the source of all information.[3] Similar claims have been made outwith History education. 'Electronic text processing', according to Landow, 'marks the next major shift in information technology after the development of the printed book. It promises (or threatens) to produce effects on our culture, particularly on our literature, education criticism and scholarship, just as radical as those produced by Gutenberg's movable type'.[4] Dryden viewed hypermedia as having the 'potential to transform the structure of both classroom and entire institutions – schools and universities – and to make the teaching and practice of literature, thinking and behaviour a truly democratic enterprise ...'.[5]

These and other more radical claims regarding the impact of computers on teaching and learning have been questioned by educationalists such as Cuban. The title of Cuban's book, *Oversold and underused: Computers in the classroom*, direct the reader to his main argument that '... no revolution had occurred in how teachers organize or teach in their classrooms. Nor have there been dramatic or substantial changes in how teachers teach or children learn'.[6] In

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a similar vein, Oppenheimer argued that 'there is no good evidence that most uses of ICT significantly improve teaching and learning, yet school districts are cutting programs, music, art, physical education – that enrich children's lives to make room for this dubious nostrum'.[7] Conlon was particularly critical of claims that ICT changed the teacher 'from sage to guide' since this misrepresented the traditional role which was more complex. Conlon also expounded on 'seven deadly sins' committed by proponents of ICT who often were uncritical, made misleading claims, over-concentrated on skills, lost perspective, put systems before people, shared out the benefits unfairly and believed that technology is neutral.[8]

The sceptics find ammunition in the fact that the rhetoric of many politicians and educational policymakers regarding computers in the classroom does not match the reality. John Clare, education editor of *The Daily Telegraph*, reported that '... the £2 billion the Government has poured into wiring schools to the information superhighway and giving pupils access to computers has still had no discernable effect on standards of teaching or learning'.[9] A separate survey of ICT co-ordinators in Scottish Primary and Secondary schools identified ten significant obstacles in the way increased ICT usage ranging from too many other competing priorities to lack of relevant curriculum materials.[10]

It can be argued that the criticism and levels of use paint a depressing picture for the future of ICT in the History and many other classrooms. This article discusses the curricular and historical contexts alongside the development, production and evaluation of a series of CD-ROMs produced on themes relating to Scottish History. The article argues that, given certain criteria, multimedia can enhance the teaching and learning of history.

THE HISTORY CURRICULUM

The traditional emphasis on knowledge and understanding has been balanced by a greater use of primary and secondary sources in the History classroom. The national programme for the early years of Secondary School state that pupils should 'select and use known enquiry methods to access, select and record relevant information from a variety of straightforward sources'.[11] This carries on into Higher History, the national course for secondary year 5 (pupil age 17 years), within which pupils evaluate sources with 'reference to their provenance, content and wider historical context'.[12] Teachers select relevant sources which include film, photographs, cartoons, newspapers, personal reminiscences, poetry, music and official reports. Schick argued that this presents a golden opportunity for multimedia since 'assembling these materials would be possible in a classroom but co-ordinating them would prove a nightmare. Doing it every class day for months would challenge even teachers with the best of intentions. ... Multimedia CDs can thus provide teachers and students with invaluable resources, resources

unavailable (in a practical sense) to them in conventional modes of teaching'.[13] This emphasis on sources runs in parallel with the development of enquiry skills defined in terms of 'preparing for tasks', 'carrying out tasks' and 'reviewing and reporting on tasks'.[14] In Higher History this takes the form of an extended essay when pupils select an issue, carry out the relevant research and, under strict supervision, write the resultant essay which counts towards 20 per cent of the final award.

THE MULTIMEDIA PROGRAMS

An enquiry methodology which uses primary and secondary sources provided the curriculum content for a series of multimedia resources and CD-ROMs written, developed and produced at the University of Strathclyde in Glasgow. The programs are:

- *Moving House*: which analyses commercial and residential change in Glasgow, 1830–1930;
- *Glasgow, A Tale of Two Cities*: a study of contrasting lifestyles in Victorian Edinburgh and Glasgow;
- *Tiree Famine and Clearance*: Tiree, a small island off the west coast of Scotland, provides a case study into famine and clearance in nineteenth century Scotland;
- *Doon the Watter*: examines the first example of a mass tourist industry in modern times with the holiday trade to towns and villages along the River Clyde;
- *Auld Reekie and the Dear Green Place*: allows pupils to study life in Victorian Edinburgh (Auld Reekie) and Glasgow (the Dear Green Place);
- *Changing Scotland, Scottish Society 1880–1939*: focuses on the key changes brought about by industrialization and urbanization in such areas as housing, education and religion.

A seventh program, is currently being developed. This examines the treatment of poverty in nineteenth century Glasgow with specific reference to Barnhill Poorhouse, the largest residential establishment in Victorian Scotland.

Key sections from *Changing Scotland* illustrate more general features of each program. *Changing Scotland* contains a range of media including census databases, film, photographs, personal reminiscences, cartoons, supporting text, a note-taking facility, music and quotations from present day historians. As Figures 1–5 show, these are inter-linked within the context of an explanatory text and points for discussion and debate.

This program was primarily written for Higher History in which industrialization and urbanization form part of the syllabus examined by essay questions. Consequently, the CD-ROM contains a guide to writing historical essays.

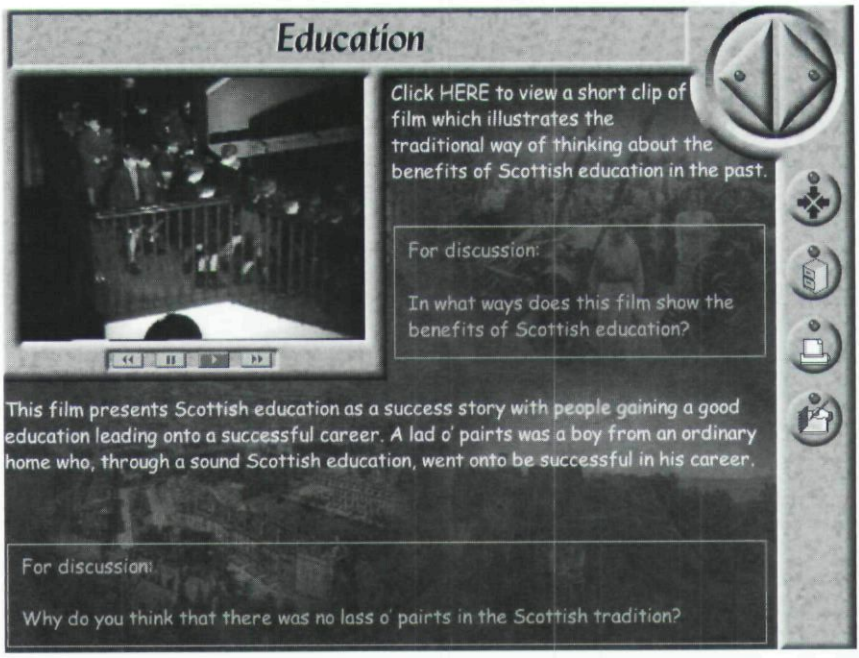

Figure 1. Card suggesting points for discussion related to a 1938 documentary film on Scottish education.

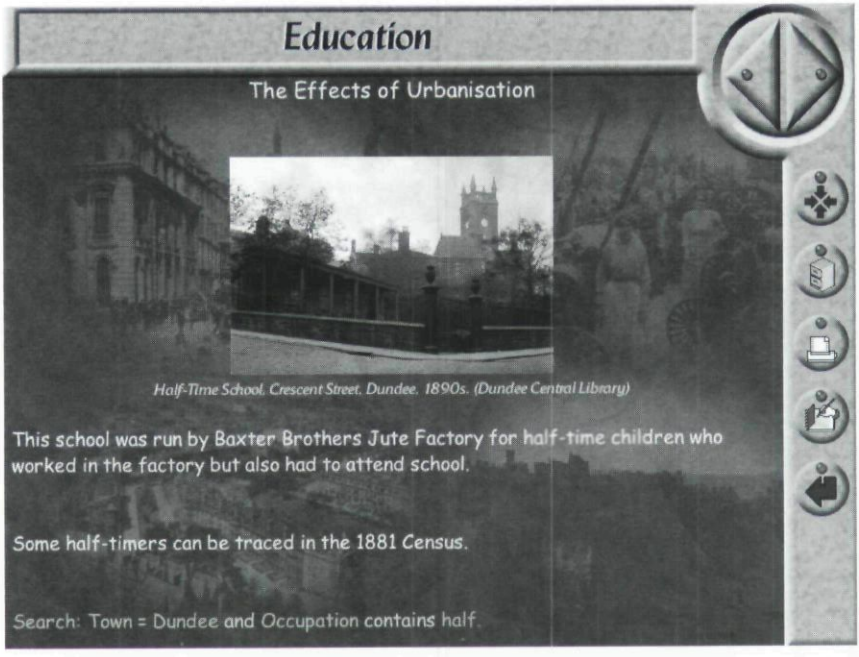

Figure 2. Card with a database search linked to a photograph of a 'half-time' school.

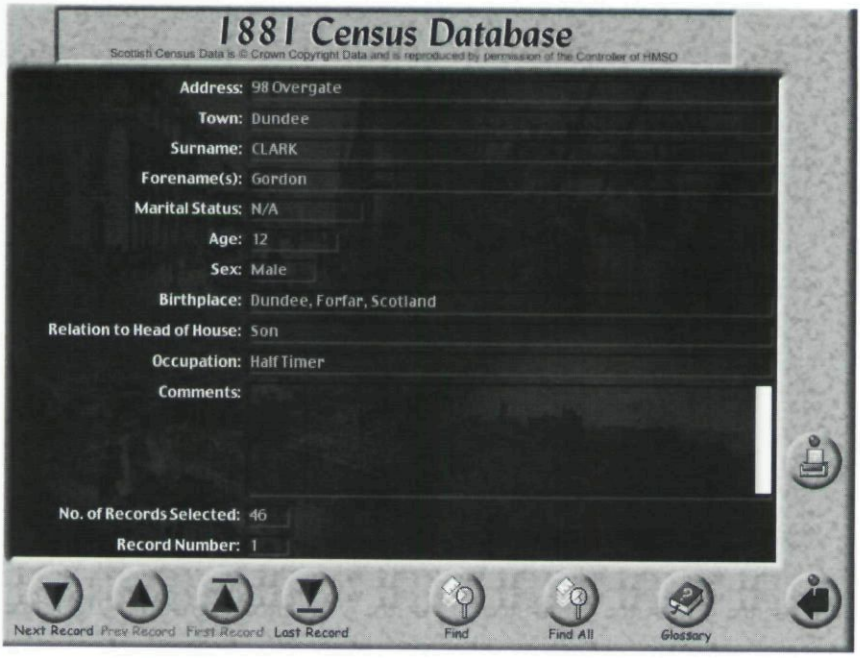

Figure 3. Card 1 from the search given in Figure 2.

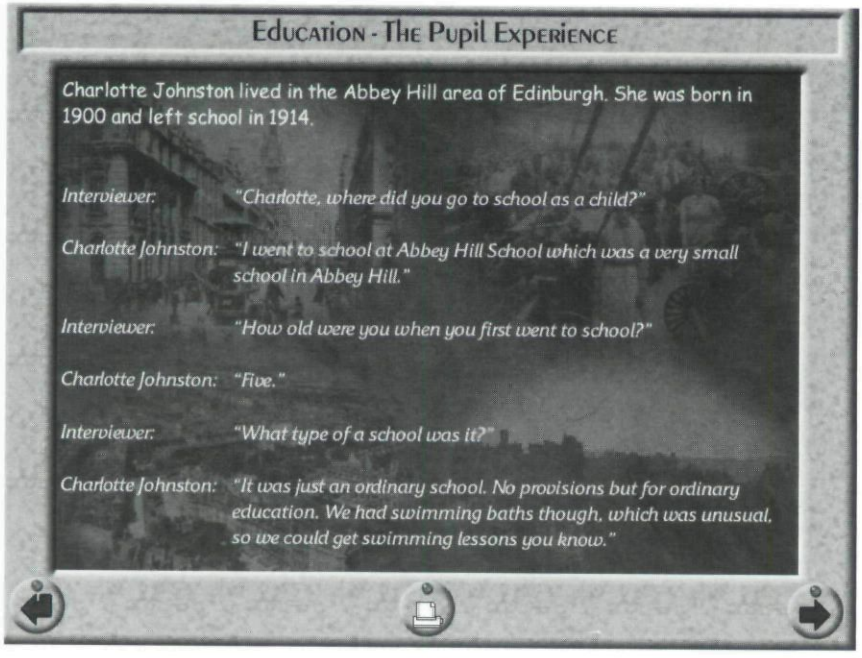

Figure 4. Personal Reminiscence of school days.

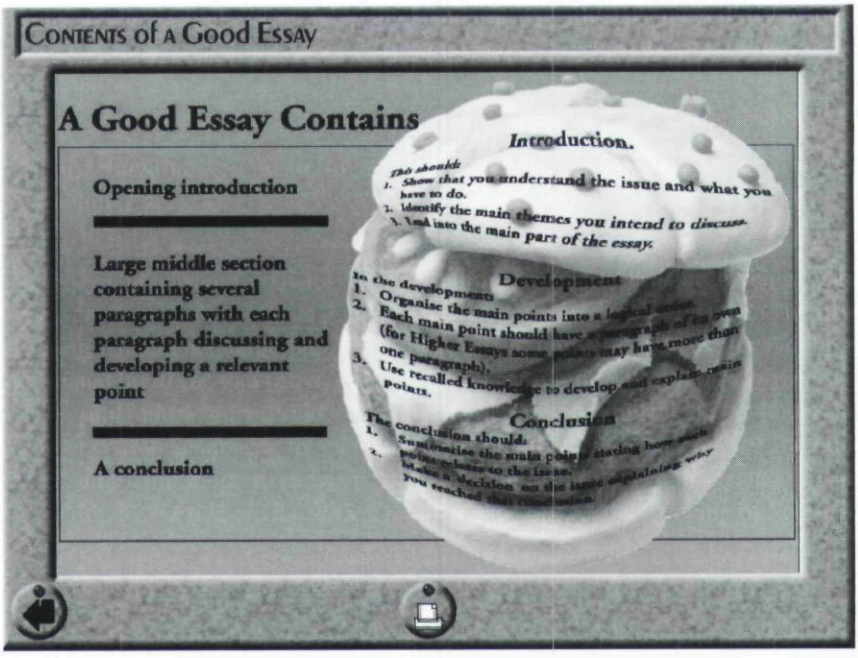

Figure 5. Guide to essay writing.

EVALUATION BY PUPILS AND TEACHERS

The evaluation was managed by the author of the CD-ROMs who, it could be argued, had a vested interest in a positive outcome. Nevertheless, it resulted in some consistent findings which in turn help frame criteria for successful multimedia in terms of enhancing teaching and learning.

Cuban criticized the top down model for deploying computers in schools when 'public officials and school administrators rarely involved teachers in either the decision to purchase and deploy computers, or the designs for the technology's use in schools'.[15] These CD-ROMs, on the other hand, involved pupils and teachers in trialling and evaluating each program. Evaluation methods included questionnaires, interviews and filming pupils and teachers working with the CD-ROMs. Further evaluation took place through peer review of the programs and subsequent articles. This article now considers the evidence from evaluation of firstly *Changing Scotland* and, secondly, *Doon the Watter* and *Auld Reekie and the Dear Green Place*. Although the programs were used by different age groups certain common trends emerged which provide guidance for future developments in educational multimedia.

In May 2004, one teacher and twenty-four pupils took part in an evaluation of *Changing Scotland*. The pupils, aged between sixteen and seventeen years, were

studying Higher History with the evaluation taking place at the end of the course, four weeks before the final examination. The timing of the evaluation influenced pupil reaction to the program. A questionnaire, interviews and film were used to gauge this reaction with the questionnaire focusing on ten key areas. These covered the general reaction to the program, specific comments on the sections, media, activities, alongside the skills and knowledge developed.

Pupils recorded a mixed reaction with 70 per cent noting that they had enjoyed studying the CD-ROM. The remaining 30 per cent were unanimous in expressing the view that since the topic came at the end of the course the time would have been more profitably spent on revision:

> It may have been useful and enjoyable at the beginning of the year however it seemed to waste valuable study time when the exams are so near.

The three most common reasons given for enjoying the program were that it was a 'change from the usual format of lessons', a 'different way of getting information and researching' and that 'you can work at your own pace of learning'.

Pupils concentrated on selected sections notably notetaking, the database, religion, entertainment, education, work and the growth of towns and cities within which film, video and the photographs were studied by every pupil. Film and video were rated as the most helpful since they 'took you back to the time making it easier to imagine'.

The CD-ROM contains a variety of suggested activities and tasks including searching the databases, notetaking and analysing sources. Searching the database, 94 per cent, and notetaking, 88 per cent, provided the commonly used and highly rated activity/tasks. The databases, noted one pupil, 'were impressive, I haven't seen anything like them before, they showed you what people were like' while notetaking 'allowed you to record important information'. Asked to record the overall advantages of the program, 22 per cent of pupils wrote that it was 'clearly laid out/easy to use' with other reasons including, 'it was a quicker way to find information' and that it provided 'an easy way to take in information'. The disadvantages mainly related to technical problems with poor quality sound on the computers, some of which kept crashing.

The questionnaire listed eight skills associated with the program and pupils rated these from 1 (most improved) to 8 (did not improve very much) as shown in Figure 6.

This corresponds to the results for the activities since using a database and notetaking were the most improved skills. Pupils also rated independent research more highly than group work.

A knowledge-based pre-test asked pupils to outline the five most important ways in which urbanization affected Scottish society with the same question repeated in the questionnaire completed at the end of the topic. In the pre-test pupils could only identify fewer than five consequences, but by the end of the

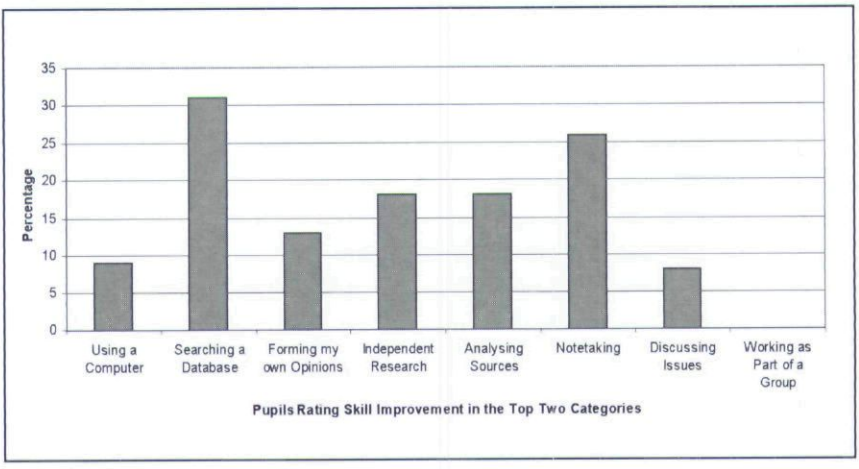

Figure 6. Improvement of skills.

topic every pupil could explain five features such as the impact of urbanization on religion and housing. However, it is important to emphasize that pupils studied the CD-ROM alongside the course textbook making it difficult to attribute enhanced knowledge solely to multimedia. Nonetheless, the program can take some of the credit since it was the central resource for the topic.

The teacher evaluation was also generally positive. On a scale of 1 (easy to use) to 5 (very difficult), the program was rated at 1 due to 'its design with straightforward navigation, but I also had a Smartboard for explaining how to use it to the whole class at the start'. This influenced how the teacher organized the class:

> At first whole class explanation of the CD-ROM using Smartboard. Subsequently, either individual pairs or groups at each PC working through tasks for each aspect of the topic. They printed out answers/notes from notetaking facility for me to look through before returning them for future revision. At end used Smartboard again to explain/discuss essay writing. Each pupil also had their own copy so could use it at home for finishing off and homework tasks.

Teacher and pupils shared similar perceptions of the media and activities with the visual sources and notetaking facility highly rated. Asked to note any future changes to how the CD-ROM was used, the teacher noted:

> I would make more use of the notetaking facility to type up and print out tasks as it helps focus pupils and they see how much there is to do. I would try to build in at least one period of investigative work making more use of the database.

Overall, the CD-ROM 'packed in a lot, but at the same time presented a manageable way through the topic'.

The evaluation of *Doon the Watter* and *Auld Reekie and the Dear Green Place* took place between 2001 and 2002 in three schools with ninety-two pupils and three teachers using questionnaires, interviews and filming class activities in two of the schools. The pupils were at stages Primary 6 and 7 (ages 10–12 years), but the findings were broadly similar to those provided by the older pupils who worked with *Changing Scotland*.

Teachers used *Doon the Watter* and *Auld Reekie and the Dear Green Place* in a variety of different ways encompassing related topics, such as a river study and tourism, alongside historical themes relating to Victorian Scotland. This evaluation relates to the last category when pupils used each program to study aspects of life in nineteenth century Scotland.

The availability of computers influenced class organization. In one school pupils could work individually in the setting of a computer laboratory, but in the other schools groups of pupils moved to and from a more limited number of computers. In all schools the CD-ROMs provided the central resource supplemented by artefacts, books, alongside wide ranging activities including art, drama and field studies. Teachers did not work through every section of the CD-ROM, choosing instead the most relevant areas for the topic.

Auld Reekie and the Dear Green Place proved more popular than *Doon the Watter* with 93 and 82 per cent respectively of pupils recording that they had enjoyed working with each CD-ROM. One pupil summed up the minority view for *Doon the Watter*:

> I did not enjoy it very much because it didn't interest me. I'm not really into boats and rivers. Though I did like using the computer.

This and similar views were expressed in an open-ended question to which pupils could give any answer, but this did not prevent consistent themes emerging from the positive evaluations. These revolved around the multimedia dimension and the impact on teaching and learning. Fifty-three per cent of reasons clustered around 'doing my own research', 'finding out' and 'helped me learn' within which the research dimension was recorded by almost 20 per cent of pupils. The general appreciation of the multimedia dimension co-incided with gradings given to each individual medium such as film and databases. Fifty-six and 74 per cent respectively rated the films/video and the databases as the most useful resources. The reasons given by two pupils reflect the overall findings: 'Because you found out where people lived, what age they were, their nationality, their job and name' and 'I could see what it was like. Interesting – it brought it to life.' Where the first refers to databases and the latter to the film and video components.

Each program includes varied activities and tasks; *Auld Reekie and the Dear Green Place* contains twelve separate activities, with pupils in one school

omitting only essay writing, model making and compiling their own board game (from a given template) on life in Victorian times. As indicated above, pupils also designed and created a wall frieze depicting life in Sandyford Place and Malta Street in Glasgow. The same class visited Scotland Street Museum which recreates a Victorian classroom right down to giving pupils the experience of being taught in a similar manner to their Victorian counterparts. The omission of essay writing from completed activities resulted from its more common practice in secondary schools, but the primary age pupils wrote more extensively than single sentence answers by, for example, writing letters and scripts for presentations. The questionnaires asked pupils to describe any five key features which they had learned about either Victorian holidays or houses depending on the program studied. The importance of the River Clyde (64 per cent) and overcrowding (47 per cent) were the most frequently recorded features. This suggests that the CD-ROMs developed knowledge and understanding but, as in the case of *Changing Scotland*, the programs provided one of several resources, making it difficult to claim that these examples of ICT were solely responsible for any gains. Nevertheless, History teaching which relies on one resource would run contrary to the subject's life blood, diversity and debate.

Pupils in School C rated using a computer and a database as either the most or second most improved skill. This is shown in Figure 7.

The other schools reported similar percentages although the difference between working by myself and working as part of a group was less noticeable. The explanation may lie in the availability in School C of a computer laboratory which gave individual pupil access to the program. This School also had a higher percentage of pupils with behaviour and learning difficulties making some pupils appreciate the provision of an environment where they could quietly get on with their own work:

Pupil A: '... because I could do it quietly by myself'.
Pupil B: 'I could do it by myself and we were doing our own research'.

Figure 7 also emphasizes the importance of the census database which matches the gradings given by the older pupils who used *Changing Scotland*.

Negative comments concentrated on issues of technological reliability and specific features of the CD-ROMs. Pupils reserved most criticism for 'computers which kept crashing', a particular problem in one school where *Successmaker* conflicted with *Auld Reekie and the Dear Green Place*. Earlier, this CD-ROM had to be re-programmed since Windows 2000 conflicted with the version of Director used to author the program. Cuban defined this and similar difficulties as 'rampant featurism' which remains an obstacle to the increased use of ICT in schools.[16] Pupils also criticized the amount of reading required and the inability to save their notes directly on to the CD-ROM. These are currently being addressed for the next CD-ROM by recording more of the primary and secondary

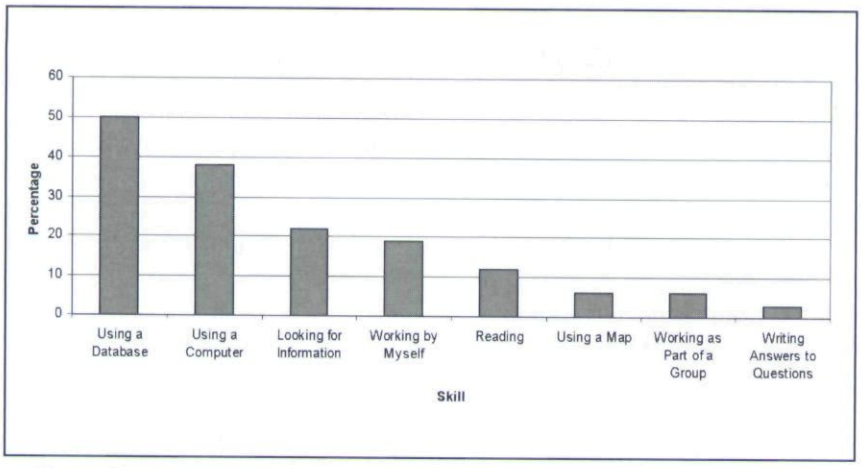

Figure 7. Improvement in skills. Percentage of pupils rating skill improvement in the top two categories, school C.

sources and providing a facility whereby notes from the CD-ROM can be saved directly on to the user's hard drive.

Teacher evaluation emphasized the Scottish/local dimension, the impact on teaching and learning and the multimedia dimension. History teachers have often found it difficult to access software relevant to Scotland's past with publishers tending to prefer larger markets in England and North America. The CD-ROMs relate directly to Scottish, and in some cases, local History:

> We went into the database for William Street (Helensburgh), one boy in the class lives in William Street. ... We were quite delighted particularly when we have information like that appropriate to our area.

Another teacher appreciated resources on the Victorians relevant to Glasgow 'since many books have been produced for the British market'.

Comments relating to teaching and learning coalesced around the enhancement of research/investigative skills and independent learning. In the opinion of teachers, these CD-ROMs changed their role in the classroom in ways which benefited pupil learning:

> They thoroughly enjoy using it. They love getting on the computer. ... We use the computer in groups – children go out and work quite independently through the program.

In another school the teacher wrote:

> A group of children when set a task, could work well together with the minimum of teacher input.

In 2002, Estelle Morris the then Minister of Education in England and Wales, claimed that an additional 1 per cent on the school pay bill could be used to buy more lap-tops and many thousands of support staff. This echoed a similar statement made by her predecessor that 'if pupils are working from lessons on the internet, a trained classroom assistant may be as useful as a teacher'.[17] Such sentiments can only heighten teacher sceptism towards ICT and any enhancement of independent learning. However, the realities of the classroom ensured that when using the CD-ROM the teacher's role changed rather than diminished with an emphasis on planning, support, assessment and management of the classroom activities and resources.

Every teacher reported that the programs encouraged research and resource-based learning. *Auld Reekie and the Dear Green Place* led to 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'.

This depended on the activities and resources within each CD-ROM as demonstrated in the following two quotations:

> The multimedia aspect helped to make lessons and discussions come alive. Worksheets and activities compiled to work with the program led to some good quality resource-based learning.

and

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

Teachers' criticisms mirrored those voiced by their pupils. Some pages had 'too much script – (pupils) were impatient to continue and reluctant to take time to read it'. In the notetaking exercise 'being able to save the children's work would make the program easier to manage' while 'printing problems often occurred and many children needed more time to complete their work'. As noted above, subsequent programs provide a facility to save notes, but problems with printing resulted from the networking of computers in a laboratory to one printer which could not manage multiple requests.

CONCLUSIONS

The development, production and evaluation of these CD-ROMs provide some pointers for the creation of effective multimedia in History. Teachers and pupils reported that the CD-ROMs enhanced research skills which correlates with the high value placed on the census databases as a resource and consequently in developing the ability to interrogate information. Pupils framed questions which in turn led to further enquiries creating a level of interactivity demanded by Schick:

> The term 'interactive' involves two related issues: control and response. ... In practice, both control and response basically mean that the user does something to the machine – provokes another screen. What should also happen is that the machine does something to the user – provokes another idea. It is here that much 'educational' software fails.

Designers of educational software 'must ... provide information which the user can apply to other problems, to strengthen cognitive skills for processing new data or to ask questions which challenge the user to think differently about the past'.[18] One pupil described his/her interaction with the database:

> We first looked at the census which was interesting, then we went deeper, looking at people's lives and how they lived. We also found out where they would go on holiday. I found out a lot of information'.

Multimedia can enhance the teaching and learning of History, but only if 'real History' rather than technology sets the agenda. 'Real History' is History with a problem or a puzzle at its core which develops knowledge and understanding alongside an enquiry method of learning involving framing questions, finding answers and presenting the results. Multimedia provides educators with a resource which allows pupils to interrogate a wide range of primary and secondary sources within a manageable and sophisticated environment. Herein lies the ingredients for successful multimedia: a rich range of historical sources mixed with an enquiry method of learning.

ENDNOTES

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[16] Cuban, *Oversold and underused*, 173.
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[18] J. B. M. Schick, 'On being interactive: re-thinking the learning equation', *History Computer Review*, 11 (1995).