The Supertext Superdisc Project

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>The Australian Caption Centre has just completed the production of the supertext superdisc: *Ask the Workers ....*, Australia's first laser videodisc produced specifically for use in schools. During the latter half of 1986 the materials produced during the Project were evaluated independently in Western Australia with funding from the Australian Government's Commonwealth Schools Commission under its Projects of National Significance scheme. This paper provides some background information about the Project.

The Australian Caption Centre

The Australian Caption Centre is a national, non-profit organisation set up in 1981 with Australian Government funding to provide a teletext subtitling service on broadcast television for hearing impaired people. The Centre now subtitles over twenty hours of television programs each week, as well as a significant amount of non-broadcast video material for the entertainment, information and education of viewers who require subtitles to aid their comprehension of video and television programs. Because of the technological expertise gained in implementing the subtitling service, the Caption Centre's role has been broadened to ensure that the advantages of new information technologies flow to all disadvantaged groups.

The Centre operates the subtitling service for all commercial television networks and the Australian Broadcasting Corporation, and is independent of any Government subsidy.

Nature of the videodisc medium

The supertext superdisc package was designed to demonstrate the special features of the videodisc as a medium for the delivery of learning materials. These features include:

- provision of high quality still and moving visual information
- accurate and rapid random access to any single frame
- ability to play at a variety of speeds both forwards and backwards
- subtitles
- complex branching structures
- interactivity and learner control of presentation (under control of an external computer).

None of these features is in itself unique, but potentially the combination results in an extremely powerful medium for supporting learning. A videodisc player can be used in combination with a computer to individualise the presentation of material for each viewer. The system used by the computer to order the presentation for a particular viewer can be quite complex, depending on how the computer has been programmed.

This combination of visual and computer material, presented to the viewer in a manner tailored to his or her needs and under his or her control, is a particularly important aspect of the superdisc project and the designers hope that this aspect will be explored fully by those involved in the subsequent use of the materials.

The supertext superdisc Package

The superdisc is a one-sided PAL LaserVision standard videodisc containing 34 segments of video and still picture materials: an introduction, 6 sequences covering general aspects of career education, a store of 1,000 still pictures covering more than 250 different types of work and twenty-six one minute motion video sequences covering a representative sample of jobs available in the workforce. See Figure 1 for a visual contents list for the material contained on the superdisc. Each box represents a segment on the superdisc, with the start frame number and the chapter number given for reference.

In addition the superdisc itself, the package also contains a computer program designed to tailor the presentation of the material on the superdisc to suit the abilities and aspirations of individual students, and a Teachers' Guide explaining some of the ways the materials can be used. Even though this supporting material has been provided, it was a part of the design of the package that the superdisc could always be used on its own, even if all the documentation, including the videodisc cover itself, were lost.

The superdisc is designed to help students see how they can match their own individual skills and interests with possible career choices. It is not a vocational guidance package – it is intended to provide resource materials to support classroom teaching and other activities. In fact, there is a wealth of existing material available which must be used in conjunction with the superdisc if the full potential of the package is to be realised.

Aims of superdisc materials

In terms of a product the major aim of the Project was the production of a package of materials on career education for use with deaf, hearing impaired and hearing students in secondary schools. In doing so, the Project has resulted in the production of materials which concentrate more upon the developmental side of the career education process rather than simply giving information.

Introduction 00001 — Main Menu CH1-1557

| Career Advice CH2-1560 | Options CH3-2952 | Education CH4-4363 | Changing Jobs CH5-5472 | Dress CH6-7348 |

Interview CH7-8681

Key
[Segment]
[Chapter-Frame]

Picture Store CH8-CH16-10987

	Group 4	Group 3	Group 2	Group 1
Practical CH17-12027	Nursery Assistant CH18-12029	Horti-culturist CH19-13511	Nursery Manager CH20-15142	Landscape Architect CH21-16716
	Trades Assistant CH22-18287	Carpenter CH23-19835	Draftsperson CH24-21229	Builder CH25-22742
Scientific CH26-24284		Computer Operator CH27-24287	Computer Technician CH28-25485	Computer Programmer CH29-27211
Administrative CH30-28705	Clerical Assistant CH31-28708	Accounts Clerk CH32-30149	Pay Clerk CH33-31683	Accountant CH34-33119
Artistic CH35-34527	Ticket Writer CH36-34530		Copywriter CH37-36003	Creative Director CH38-37464
Social CH39-39560	Messenger CH40-39563	Personnel Clerk CH41-40948	Nurse CH42-42380	Personnel Manager CH43-44026
Enterprising CH44-45522	Shop Assistant CH45-45525	Sales Representative CH46-46824	Purchasing Clerk CH47-48289	Shop Manager CH48-49587

Figure 1: Contents of "Ask the Workers ..."

In designing the superdisc package the design team has tried to:

- overcome stereotyped images of particular jobs
- emphasise the width of career choice available, and the importance of keeping options open (and perhaps the converse, the options closed by making choices such as not continuing with their education)
- emphasise the many jobs that one person could do.
- stress that career paths are in constant change
- help classroom teachers assist students in career development.
- give all students equal opportunity for vocational choice by providing them with critical information about careers and practical knowledge of job seeking skills
- encourage young people to do their own research by engendering in them the spirit of exploration, and to provide stimulus material for use with hearing impaired children
- show the students a range of different information sources as they search for clues to their possible careers

The evaluation of the materials carried out during 1986 and 1987 will reveal how successfully these aims have been achieved.

History of the Project

The supertext superdisc Project began in 1983 with an approach to the Caption Centre from the Western Australian Branch of the Australian Deafness Council for a project to investigate the use of new technologies in deaf education. The Caption Centre, the WA Branch of the ADC, the Education Department of Western Australia and many other agencies, including the Western Australian Institute of Technology, the University of Western Australia and the Federal Department of Employment and Industrial Relations, have co-operated in the Project.

After more than a year of development work, the four-stage Project began in earnest in May 1985 after the Lotteries Commission of Western Australia provided the WA Branch of the ADC with an initial grant of $50,000. This grant was used to write the script and to design the computer programs. In July 1985 the Lotteries Commission provided an additional grant of $58,000 to maintain the Project through the Production and Editing stages.

Although the Project was originally intended to investigate the potential for the use of videodisc in teaching the deaf, it soon became apparent that with a little thought at the design stage the materials produced could be structured to suit students with a broad range of abilities. In fact, a condition of the involvement of the Education Department of Western Australia in the Project was that the materials would be able to be used by mainstream students.

Production facilities for the recording of the video materials were provided by the Audio Visual Education Branch of the Education Department of Western Australia, with the Project funds covering the employment of an outside director and additional crew, and the actors used in the video sequences. The Education Department received ten copies of the superdisc, computer programs and other materials produced during the Project in return for its involvement.

The production and editing for the videodisc were completed in late 1985 and the superdisc itself was delivered in late February. The computer program developed to demonstrate how the superdisc could be used with individual students was completed in June 1986 after some pre-evaluation testing in some Australian Capital Territory schools. In addition to the superdisc itself and the computer program, the package also contains a Teachers' Guide, written by the Instructional Designers and the Project Director. The Education Department of Western Australia also allocated funding for a two-day inservice course which was designed to introduce the materials to the teachers who would be using them in schools during the evaluation period.

However, despite the cooperation received by the various agencies involved, the Project could have been even more successful if there had been more resources made available to support additional aspects of the original design which were unable to be implemented. Additional technical support from the Western Australian Department of Education in the use of the BBC microcomputer would have useful, as would have been programming support for the coding of additional programs designed by the Instructional Designers. As the first extensive use of videodisc in schools in Australia, one would also have expected the marketers of the hardware involved in the evaluation to have been a little more enthusiastic about the Project and supportive in terms of the supply of equipment for evaluation purposes and technical backup when faults were identified.

The superdisc

The superdisc is designed to be a flexible resource: it can be used by a teacher in a classroom with a group of students, using only the videodisc, a monitor or television set and a standard

videodisc player, or it can be used in conjunction with a microcomputer attached to a professional videodisc player to deliver information structured to suit the individual student using it one or two at the time.

The Development of the Package

The Caption Centre has always seen the superdisc Project as a way of demonstrating how new technologies can be harnessed to serve the needs of the disadvantaged – in this particular case the new technology concerned is laser videodisc, both computer controlled and stand-alone. The method of delivery is therefore considered more important than the content: career education.

Career education was chosen as the subject matter of the superdisc for several reasons:

- Finding out as much as they can about the range of possible careers is an area of particular concern for deaf and hearing impaired people, as well as for hearing people.

- Little work had been done in the area, in terms of the development of suitable curriculum material for use in schools.

- Notwithstanding the vast amount of career information available, there is little structuring to it allowing easy access for individuals to satisfy their own interests and aspirations.

The Design Team

Once the funding for the development of the Project design was in place, and the subject matter chosen, the Caption Centre put together a team of people to realise the Project. Some of these people were paid directly by the Project and some were on salaries elsewhere. The Design Team operated under the day to day direction of the Project Manager, who was responsible directly to the Executive Directors of the Caption Centre, acting as the Executive Producers for the Project. Others who made up the Design Team included:

- Instructional Designers
- Content Specialists
- Computing Experts
- Media Facilities Coordination
- Scriptwriters
- Teachers
- Evaluator

It was the responsibility of the Instructional Designers to research and plan the overall package in conjunction with the Project Director, content specialists, teachers, media and computing people.

Scripting

In designing the superdisc particular attention was paid to avoiding the production of a 'storyline' type of video program, to which videotape is best suited. The designers also avoided an exhaustive search through a database: there are other computerised systems to which such searching is more suited. Rather the superdisc package aims to capitalise on the particular strengths of the interactive videodisc, so that its educational potential can be utilised fully.

Technical Set-up

The superdisc can be used by itself in any PAL laser videodisc player which has chapter and picture search functions (which is all PAL LaserVision or LaserDisc players currently on the market). It can also be used in a system by connecting together an Acorn BBC Model B computer with a Philips VP835B videodisc player. In this set-up, the computer controls the presentation of computer generated text and motion or still video to the student in response to the student's response to questions asked or alternatives presented.

The computer program designed to control the superdisc is set up to operate from an Acorn BBC Model B computer which has a Microtext Run-time ROM installed. Microtext is an authoring language for computer assisted instruction packages developed by the National Physical Laboratory in the UK. The computer program is set up to control a Philips VP835B videodisc player. The 'B' player has a Teletext encoder, but no microcomputer installed in the player itself. The computer program supplied with the superdisc will not run any other videodisc player apart from the Philips VP835B, since different videodisc players need to be controlled differently. Different brands of players require different control codes in order for the players to respond in similar ways, hence the tight specification for the equipment required to run the program.

The design for the computer program has been done in a non-specific way, which means It should be relatively simple to mount the computer program to run on a different player and different computer if required.

The Acorn BBC was chosen for a number of reasons. Firstly, because it is a machine which is in use in WA schools, although mainly in primary schools. Secondary schools normally use the Australian-manufactured Microbee. The Microbee was not used because no computer software had been developed to operate a videodisc player from the computer. Even though this is not a particularly difficult exercise the Caption Centre was not convinced that there would be resources available to do the necessary programming work to control the player as well as implement the Instructional Designers' proposed computer programs. The second reason for the choice of the Acorn BBC was that the National Physical Laboratory in the United Kingdom had developed a version of the Microtext authoring language which could be easily extended with commands to drive the Philips' 835 series videodisc players. Videodisc extension commands for Microtext Plus were available from another UK company, The Soft Option. This meant that a complete authoring software package could be bought "off-the-shelf", and the computer programming could be done relatively easily.

It was also thought that the use of an authoring language would allow classroom teachers easy access to the interactive level of videodisc applications, by giving them the ability to develop their own programs to suit their own students. Two factors have worked against this: the cost and availability of the software, and the general propensity of teachers not to produce particularly effective software.

Although this may change in time with the development of more easily used authoring-type computer software, it was decided that for the Caption Centre's implementation and evaluation period in Western Australia, no authoring capability would be offered. The programs authored in Microtext run under Runtime ROMs, which are cheaper than the authoring ROM but have no authoring capability. It will be interesting to see how teachers feel about not being able to modify the software themselves.

Another reason for using the Acorn BBC was its use of teletext - which fits in with the Caption Centre's use of teletext for subtitling and its manufacture of a teletext decoder. The Philips players' capability to encode (as opposed to decode) teletext means that the output of the

computer could be overlaid on the video output from the videodisc player easily, by the addition of a teletext television receiver or teletext add-on decoder. Except for the addition of the Microtext ROM, this allowed computer overlay from a totally standard Acorn BBC computer, which was another of the design criteria for the computer to be used.

Use of the superdisc

Group Uses

The major use of the superdisc is as a tool in a classroom with groups of students, where its intended function is to motivate students to find out about careers and to stimulate discussion. Each video segment or vignette runs for about one minute.

They are designed as triggers for classroom discussions about a number of issues related to finding out about what jobs are available and how to go about getting a suitable job. The Teachers' Guide contains a number of suggestions for using the superdisc in a videodisc player without an attached computer.

Using the Computer Program

When attached to a computer the superdisc becomes a powerful tool for individualised learning. The program is designed for use by students working alone or in pairs, although it could be used for larger groups. Ideally, the equipment will be set up and available for students to use on their own or in small groups. The location of the set-up depends on the teacher responsible for the materials, and on local conditions.

If available, a media room or section of the library set aside for viewing audio visual materials would be the right spot. A careers room might also be appropriate, or perhaps some corner of a classroom where students could work undisturbed for the 15 to 25 minutes they might take working through the package.

Aims of the Computer Program

The aims of the computer-controlled presentation of the superdisc materials were as follows:

- To determine the educational level to which each student aspires.

- To help the student rank the six job or personality types in order of the student's own preference.

- To present to the student some aspects of careers relevant to the student's expressed aspirations and preferences.

- To encourage students to reassess their choices and explore the possibilities offered by alternative career options.

The computer programs begin with a quite rigid presentation, but as the student progresses through the material, more and more choices are open to them as they become more familiar with the material (Figure 2).

At the beginning of the program, the student is presented with a series of questions to be

answered in order to determine what their current year level at school is, their educational aspirations and their preferred interests. On the basis of their answers, the students are placed into one or more of the interest categories used in the Package. An Interest Profile is generated from the student's responses to the questions regarding his or her interests, and then a segment on the superdisc matching the Interest Profile is offered to the student. At the end of the segment, the student is offered the choice of seeing material from the picture store relevant to their interests. If appropriate, the student is then offered the opportunity to see what other jobs are available to suit their interests, if they were prepared to gain more education or experience than they had indicated initially.

Once these choices have been offered, the student is then able to change the interests expressed previously and to see the jobs which might suit the new interests. Students may also exit from the program at this point. Students can also explore the material freely by selecting from a series of options, and they have the opportunity to see all of the 26 job segments on the superdisc.
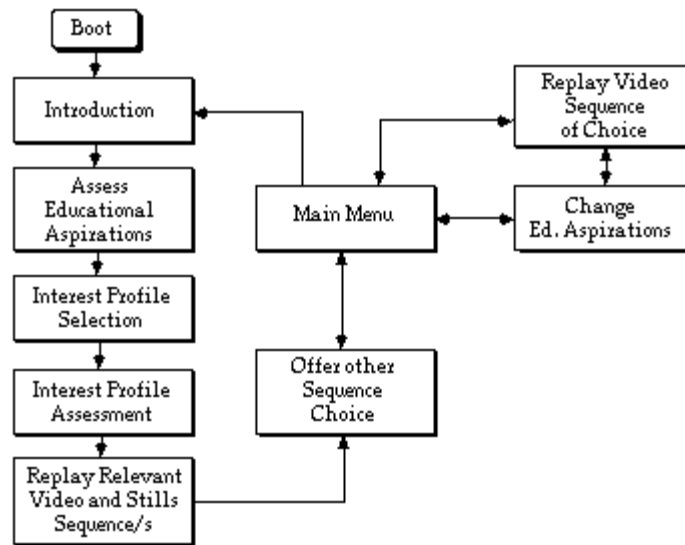

Figure 2: "Ask the Workers ..." – Computer controlled Presentation

After all the students in the class have gone through the materials on their own or in groups of two or three, and after they have had a chance to seek out further information on the sorts of jobs which might interest them, the Teacher's Guide contains a number of suggested activities for teachers to use as follow-up activities.

The Implementation and Evaluation Stage

During the third and fourth school terms in 1986 the package was evaluated independently in ten sites in Western Australia under the direction of Professor Michael Scriven from the University of Western Australia. The ten sites included those schools in and around Perth where deaf students are enrolled. The evaluation stage has been funded by the Commonwealth Schools Commission as a Project of National Significance, with a grant of $43,600 which in addition to Professor Scriven's evaluation includes provision for the publication of a Report on the entire Project and coordination expenses for the final stage. The videodisc players, computers and television monitors for the evaluation stage were provided by the Education Department of Western Australia and the Caption Centre.

The evaluation was to examine the role of the superdisc as an educational videodisc from a number of viewpoints. Comparisons would be made between existing methods of teaching career

choice and career planning, and the use of the superdisc package of materials prepared for the Project.

The effectiveness of the superdisc was to be addressed from the standpoints of:

- classroom teacher
- students at different levels
- students from different locations
- other specialised groups – CES, hearing impaired.

The evaluation was structured to investigate whether the package of materials produced:

- has cognitive impact on students
- motivates students to take career options seriously
- compares, in terms of costs, favourably with other forms of information (such as career planning materials from DEIR)
- compares, in terms of effectiveness, favourably with other stand-alone materials
- will stand the test of time and hard use
- offers equal opportunity of access to both male and female students
- promotes alternative career exploration, especially by the less able student
- promotes differential learning in students of different abilities
- is different in effectiveness at different levels of use.

The evaluation was to attempt to answer the following questions:

- Do teachers and students like using the materials in the way they are presented?
- Do users learn anything from the materials? If so, what do they learn?
- Does the Package do what it is supposed to do?
- Are the outcomes. intentional or otherwise, worthwhile?
- In what instructional setting is videodisc most effective, and for what reasons?
- With which students is videodisc least and most effective?
- What does interaction with videodisc and computer media offer teachers that they do not already have access to?
- Is learning with these new media more effective and more enjoyable for students and teachers than is learning with traditional techniques?
- What impact does the use of the Package have on teacher and student relationships?
- Are the materials worth the cost of developing and using them?

Strategy

During the evaluation stage of the superdisc Project, these matters were to be determined primarily by the use of formal, structured interviews with teachers and students who had used the materials. The interviews were designed and supervised generally by experienced evaluators, and were carried out by a researcher employed by the evaluators of the superdisc Project. Additional information was to be collected by observation of and informal discussion with the teachers and students who used the materials, and otherwise by monitoring the use of the Package.

Since the objectives of the Package concentrate on the development of higher-order mental abilities, and since the subject area covered by the materials is not generally taught in any established manner, direct comparisons between the efficacy of a number of different methods are not possible. Relative costs were to be determined by comparing the videodisc-based package with alternatives, whether on not such alternatives were in use, with the objective of determining

the real cost of the materials when compared with existing or other potential methods of delivery of educational materials.

Development of detailed instruments for the evaluation stage began in June 1986. An inservice courses for teachers involved in the Evaluation Stage was held in mid-July 1986. Equipment supplied by the Education Department of Western Australia and the Caption Centre was made available for use in schools from the end of July 1986, when the gathering of the data needed for the evaluation commenced. Data collection was completed in mid-October, with collation and report writing to be completed early 1987. The evaluator's Report w ill be incorporated with other material and published in book form late in 1987.

Sites

Ten sites were equipped with videodisc players and other equipment for the period of the evaluation. These sites were:

- Bentley Technical College *
- John Curtin Senior High School
- John Forrest Senior High School *
- WA Deaf Society*
- Melville Senior High School *
- Narrogin Senior High School (Country)
- Scarborough Senior High School
- St Hilda's School for Girls (Independent)
- Swanbourne Senior High School *
- Servite College (Catholic)*

    (* indicates a site with teachers of the deaf. These sites were chosen because they are schools or units where deaf and hearing impaired students are enrolled. In line with government policy, however, in schools the students are integrated into classrooms with other students, and it was intended that the Package be used by students with a range of abilities).

Teacher and Technical Support

Intensive inservice training for teachers using the superdisc Package was considered essential, to make sure that any lack of confidence with the technology did not frustrate the implementation. The inservice course also took care to draw teachers' attention to the equity issues around which the Package was developed. Technical support and coordination was available from the Caption Centre and the Education Department of Western Australia throughout the period of the evaluation to ensure the smooth running of the equipment.

Results

Preliminary results from the evaluation indicate that apart from a few technical hitches with the equipment and the software, the materials were received enthusiastically by those involved. The final Report of the Project, including Professor Scriven's evaluation, will be available shortly – anyone interested in receiving a copy should write to the author of this paper, care of the Australian Caption Centre (see ref. note 3).

Reference notes