# Exploring Australian Timescopes: Developing an Interactive Multimedia CD-ROM for Australian Historical Studies.

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#### Abstract

The paper discusses the research behind the development of the "Australian Timescopes" project: an interactive, multimedia CD-ROM for Australian history. Some of the capacities of interactive information technologies to deliver a wider range of primary sources and to enhance opportunities for historical education are sketched. The project is an attempt to begin harnessing these evolving capacities. The thinking behind the programme is outlined - its eductional goals; its epistemological, cognitive, and historical bases. How these have been built into the selection of resource materials, the design of the teaching modules, and the teaching / learning strategies deployed, is indicated. The project received a substantial National Teaching Development Grant from the Committee for the Advancement of University Teaching in 1994. A full prototype disc is available for demonstration.

#### **Keywords**

historical education, photographs, cognitive processes, interactivity, CD-rom

#### 1. Social Education and Interactive Information Technologies

The capacities of interactive information technologies for fast and flexible access to huge amounts of information in a variety of media - written, graphic and pictorial, aural and statistical - creates exciting challenges and opportunities for social education. Working through the educational implications of these capacities is an important research focus for our times (Forester, 1985; Langhorne, 1989). The quantum shifts in storage and access to sources provided by new technologies mean that the challenge in designing materials for social and historical studies is increasingly one of selection rather than collation. How should we choose from the burgeoning amounts of information and resources available? How do we choose appropriately? How do we make the most, educationally, of new multimedia information capacities? These are very open questions, and this project is one attempt to develop some useful models and approaches.

One of the most challenging features of new information technologies is the capacity to store and access large amounts of photographic and pictorial data (Laurillard, 1987). This can place at our fingertips the domains of knowledge constructed through the camera over the past 150 years (Berger et al., 1980). Access to substantial photographic collections can extend examinations of the nature, organisation and arrangements of social settings through richer access to physical, material and technological aspects. New dimensions of the study of body imagery and languages; of ecological, material and technological contexts; of visible signs, cues and symbols become feasible. The study of changes and continuities across time in each of these fields can be made more multi-dimensional,

enabling more comprehensive understandings of persons, times, places and of ourselves (Lowe, 1982; Ong, 1967).

The social constructions of various spaces can be studied (Hall, 1973). Who was where? When? Proxemic relationships within various social arenas become examinable. Who controlled various social spaces? Who had access? With which social spaces were males associated? With which females? What were the cues marking the boundaries? Which were the public spaces; which the private? What were the meanings shared about the nature and purposes of various social spaces? How does that help to explain the particular constructions of those social spaces in that time and place? Why create those settings in those ways? How does such knowledge help us to understand the activities that were conducted therein? Such capacities can add new dimensions to our social analyses and understandings.

The capacity to incorporate sound and audio sources and inter-relate them easily with pictorial and written sources opens further possibilities for examining the social and cultural contexts of a time and place. What can considerations of the oral language add to our understandings of persons, time and place? What might considerations of aural soundscapes add to social analyses? How did the music of a period relate to the ways in which participants thought about, perceived, and constructed their social activities, settings, situations and realities?

The "Australian Timescopes" CD-ROM project has been developed as an exploratory foray into such examinations. It is based on a Bicentennial project by Ewan McGillivray and Matthew Nickson at the Museum of Victoria which collected, indexed and stored family photographs on video disc. Nearly 8,000 photographs, taken between 1850 and 1940, have been collected and copied from hundreds of ordinary families across the State. Together, they offer a treasury of historical information, providing a unique opportunity to begin to explore some of the social education potentials of interactive multimedia. In 1994 the project received a substantial National Teaching Development (CAUT) Grant to enable the completion of a full prototype disc.

"Timescopes" is designed to engage students in journeying along pathways of interactive social inquiries that will enrich their understandings of other people, other times, other places, and of themselves. The programme is designed in two main parts. One is an open-access database enabling free searching for user-initiated inquiries. The other is a structured inquiry programme to help users make more of the social, historical and educational potentials in the resources.

For the database, 960 photographs and written sources have been chosen with the following themes in mind: work; home; school; and leisure. This provides a cross-section of social activities and circumstances across Victorian society in the 1930s and the 1880s, and enables examinations of the social contexts in which each of those activities took place. Selections of photographs, newspaper and magazine clippings, advertisements, extracts from etiquette books, from the Victorian School Paper, and some music and speeches, are included to provide more access to shared, public and dominant expectations, settings and perceptions. Each theme can serve as a window onto social worlds. These decades have been selected in part because they have been so well analysed by the Australian Bicentennial History project (Gammage and Spearritt, 1987; Davison, et al, 1987). The two decades were chosen to maximise the chronological time spread for comparisons within the Photographic Archive materials and as a means of enabling more indepth, multi-dimensional investigations of smaller fields.

Images in the database are stored in two sizes - for previewing and for closer examination of pictures and printed documents. The database can be searched by period, by subject, by location, or by photographer. Interactive capacities offer students a rich variety of evidence and information that they can explore for themselves, without the time-consuming labour of chasing around libraries and archives. Time saved can be concentrated on thinking, perceiving, analysing and building their own under-standings. Students can use this Channel either to browse amongst the materials, or to pursue inquiries initiated through the structured inquiry modules.

Three types of inquiry modules, designed to help students develop their own skills and understandings, offer ways of examining the experiences and settings shown in the source materials. A series of case studies have been programmed to develop skills of looking closely at evidence, and thinking about its significance. A second approach develops skills in using ideas and words as tools for social analyses and understanding. A number of powerful ideas are introduced, and users are guided through ways of using these concepts to analyse evidence and information. A third approach invites explorations of social living by making comparisons across time. What has changed? What has continued? Why? What do the changes and continuities mean?

"Timescopes" is designed to open more multi-dimensional social examinations by capitalising on multimedia capacities to engage students in using a range of different kinds of archival evidence: pictorial, written and aural, and to stimulate them to think about what each type of evidence can contribute to extending social and cultural understandings. A significant feature of the disc is the capacity to compare the "private" photographs of ordinary citizens with examples of "public", socially dominant images, from the same periods. This opens new avenues for exploring history "from-the-bottom-up", and for examining relationships between dominant imagery and cultural codes, and more personal experiences and private worlds.

# 2. Epistemological Bases of the Project

Current perspectives and research in social and cultural analyses, cognitive psychology, visual perception, schema theories and historical education have been applied in the selection of resources and design of the learning pathways built into "Timescopes", and to utilising the capacities for information storage, accessing and manipulation of new multimedia, interactive information technologies such as CD-ROM and interactive videodisc.

# 2.1. Social and Historical Education

Social education is about helping students understand and analyse the circumstances and experiences of living (Adams and Jones, 1983; Berkhofer, 1969). Activities and events are always parts of a social world - worlds constructed by persons, together - in and through the contexts of particular times and places. Understanding the social, cultural and historical contexts of actions, events and experiences is essential for understanding self, others, and social worlds. Developing understandings of changes and continuities in social circumstances and experiences, and probing why particular changes have occurred and what they might mean, is a fundamental dimension of historical education (Crean, 1984). The programme presumes that individuals, situations, and experiences are best understood as (a) participants in and parts of social contexts; and (b) that experiences and contexts are actively constructed by participants through inter-relations and interactions via networks of shared schemas - ideations and perceptions - and meanings, that inform actions (Arbib and Hesse, 1987; Hall, 1976).

This set of premises produces some powerful frameworks and pedagogical strategies through which to address productively the massive data-handling and delivery capacities of emerging interactive technologies. These frameworks call for a two-sided approach. Systems-type analyses built around the concept of society as networks of "parts", relationships and wholes, provide one powerful avenue of inquiry and understanding. Such analyses direct attention to inter-actions between social, political, economic, technological and ecological "parts" and how those inter-relate, and to examining social patterns, processes, relationships and functions (Parsons, 1971).

A second, complementary, avenue of understanding draws on frameworks of cultural analyses to examine social activities, settings and relationships as outcomes achieved through webs of shared schemas and meanings (Geertz, 1973; Hall, 1973). This approach requires close examinations of the networks of shared ideas - keywords, concepts and clusters thereof- and of the frameworks of shared perceptions - clusters of images, symbols, frames, perspectives and visual postures - through which individual actions, social situations and experiences are constructed and represented.

## 2.2. Cognitive Processes

The capacities of new technologies to store and handle vast quantities of pictorial data highlights the importance of perceptual skills and processes in learning and understanding. Contemporary research underlines the activeness of visual perception - "seeing is believing"- as well as the interpretative dimension of perceiving - "believing is seeing" (Neisser, 1976). Cognitive science and schema theories have drawn attention to important inter-relationships between conceiving and perceiving (Bruner, 1986). Students' capacities and processes of visual perceiving can provide valuable avenues for developing their social understandings. The fostering of such skills is also most important for dealing with the image-rich world in which we live (Langhorne, 1989).

Research over the past two decades into the nature and processes of visual perception becomes a valuable resource for insights on which to turn such pictorial capacities to educational purposes (Uttal, 1981). Two major frames, or perhaps metaphors, have guided contemporary research in visual perception. One is the "direct" approach perhaps most fruitfully and comprehensively demonstrated in the work of James Gibson (Bruce and Green, 1989). His ecological approach stresses the importance of what is there to be seen in understanding the whole process of perceiving, emphasising the empirical, bottom-up, "taking-in", dimensions of perceiving (Gibson, 1979).

Contemporary cognitive science has emphasised the active and schema-framed nature of thinking and knowing through processes of assimilating-accomodating via ideas and concepts available in the knower's culture (Gardner, 1985; Bruner, 1986; Arbib and Hesse, 1987). On-going interactions between prior knowledge and concepts in the learner's head, and evidence and experience in the world outside, provide the means for constructing our understandings of self, others and social experiences. Inquiry-oriented learning fostering processes of active "sense-making" by students is important in this respect. Being able to think for oneself and make one's own analyses is is crucial survival tool in the current era of information explosion (Bowers, 1988).

Piaget's cognitive model of assimilation-accomodation can provide a most fruitful framework for bringing the strengths and truths of the two approaches into productive interplay for the enrichment of analyses and understandings (Furth, 1969). Both avenues need to be exploited. Students need to ask both: what was there to be seen? to respond to; and what sense, meanings, understandings did the subjects make of what they saw? How did their interpretations affect the social situations they constructed together? Asking both kinds of questions is crucial if adequate understandings and analyses of social situations, events and circumstances are to be achieved.

In applying such premises to the storage and multimedia capabilities of interactive information technologies, "Timescopes" offers a number of avenues to examining pictorial evidence. Photos and image-making can be addressed as a means of social practice, process and production. Questions are raised about by and for whom were the images made? How were they produced? For what audiences? In what social settings and institutions? What was pictured? What was not? Who controlled the image-making?

Photographs are also considered as "windows" on to social worlds offering evidence for examining social and gender roles and relationships; proxemic patterns; class codes; material settings and technologies; as well as constructions of social spaces and occasions.

Pictorial sources may also be approached as cultural texts constructed through networks of shared ideas, perceptions, frames and perspectives, and embedded in processes of social meaning-making. Questions are raised about meanings shared about the signs and symbols evident in the images; about composition and framing; about metaphors employed in the picture-making; about the visual postures deployed; about the perspectives and perceptions used in constructing meaningful pictures.

Individual pictures can be fruitfully addressed as personal constructs made by particular photographers and subjects. As representations created by image-makers who were simultaneously participants in social settings and practices, and active perceivers and sense-makers who used repertoires of shared perceptions, schemas, and visual postures available to them.

In short, analysing and contextualising pictorial evidence can offer most productive avenues of extending social and historial understandings.

## 3. Design of the Structured Inquiry Modules

The structured inquiry modules build off the two major traditions of Western philosophy and knowing (Grene, 1974). One set builds from an empirical base, starting with close examinations of specific items of evidence, and fosters understandings through juxtapositions with other pertinent evidence about appropriate contexts. Students are asked to look closely, compare their observations with those of others, and hypothesise about what they see. They can then test out their tentative interpretations against a wider sample of photographic and written evidence. Comparisons can then be made with case studies in other areas of the social context; with those of their fellow students; and with published secondary sources available in their own libraries. Such an approach fosters skills in close attention, active perceiving, and interactive dialogue. Its questioning strategy challenges students to think about the significance of evidence, and to engage and extend their existing cognitive schemas.

Complementing this empirical approach is a concept-driven style of inquiry, a modern version of a time-honoured idealist tradition of learning and knowing (Arbib and Hesse, 1987). This approach begins with a key idea or concept, and helps students to use that idea to examine and interpret specific evidence and situations. A powerful conceptual framework - such as that of social roleplaying or culture - is introduced and explained through words, pictures, and sound. This part of the module can be skipped if users are already familiar with the concept. Students can then practise applying the conceptual framework to examination of selected written documents to test out its usefulness. Reviews of photographic and other evidence available in the full database, or in their schools, could then be undertaken from this perspective. Findings and interpretations could be compared with each other or with secondary sources. The questioning strategy in this top-down approach is on developing cognitive processes of conceiving and perceiving through thinking about and applying some of the powerful conceptual tools available in contemporary social sciences, and using them to interpret evidence, and to test conclusions against evidence.

"Timescopes" aims to engage students in active examinations of both types of basic social education questions. To ask both: what was there? what were the actualities? what was the evidence? - the classic empirical approach; and the more interpretative dimension: what does the information mean? for the subjects? for us? what is its significance? Both approaches address the complementarities of conceiving and perceiving, but start from different directions. Together they can service the full spectrum of "bottom-up" and "top-down" cognitive processing and learning styles (Sternberg and Smith, 1982).

Using both approaches calls for pedagogic strategies that will help students both to survey data to seek patterns and relationships in the actualities they are studying, and to read (in the sense of reconstruct) actively and carefully, the evidence available to identify frames of shared meanings

through which those involved constructued their experiences and their worlds. The strengths of outside-in observational analyses are thereby complemented by those of inside-out participant and empathy-based analyses. The most valuable understandings require both approaches, calling for a dialectical tacking back and forth between the broader canvases of systems examinations and the more sensitive and specific lenses of detailed case-studies (Geertz, 1983).

Command of written text enables studies of the ideas and conceptual frameworks through which people thought about, talked about, and made sense of their experiences (Bruner, 1986). The capacity to focus on key written passages facilitates the identification of the keywords, ideas and conceptual frameworks that were used and were significant for the subjects. Analyses of specific webs of conceptual schemas through which subjects collectively constructed their social settings and activities in a time and place, can be highlighted and modelled (Lakoff and Johnson, 1980). Students can then apply these approaches to fields and evidence of their own choice in the open-access database, or in their own libraries.

The ease with which the new technologies deliver access to large amounts of pictorial data opens up rich possibilities for exploring the inter-relations between language and perceptions; between conceiving and perceiving; between right and left hemispheres of the minds of the subjects, and of the inquirers (Sternberg and Smith, 1982). What were the frames - ideational and visual - through which those people made sense of, interacted, and together constructed their settings, activities and experiences? How did vocabulary relate to image-making?

The design of "Timescopes" seeks to capitalise on productive tensions between two fundamental and long-standing paradigms in Western epistemology. A posture of knowledge as "real" and "objective" (i.e. shared by a community of scholars / observers) is juxtaposed with one of knowledge as socially and culturally constructed. Metaphors of directness, embeddedness, and outside-in objectivity are confronted with those of construction, of meaning-making via shared schemas, and inside-out actor-centredness. Strategies for engaging students have been guided by the insights of contemporary cognitive science and by research in visual perception which indicates how perceiving and understanding is a constantly varying interaction between top-down frame and concept-guided interpretations and meaning-making, and bottom-up, empirical taking-in of observable actualities and evidence (Zubov, 1988; Sless, 1981). "Timescopes" aims to help students achieve richer social and historical understandings through engaging and extending their own active processes of conceptual and perceptual assimilation-accomodation.

The epistemological bases sketched above inform the design of the range of approaches and questions built into the structured inquiry pathways for applications to the database resources. The flexibility of interactive technology allows the programme to be used either in an individual mode, or on a small-group basis, and enables students to work through the pathways that best suit their own learning styles.

A valuable feature of the TSP software through which "Timescopes" has been programmed is its plain language base. The software offers control over the delivery of text, image and sound, allowing tailoring of resources, programs and teaching / learning strategies to the requirements of a particular group and situation. Given time, a teacher could develop his or her own programmes to suit the needs of her own students. Alternatively, she could modify and extend a core package.

## 4. Conclusion

In sum, the flexibilities and interactivity of CD-ROM and interactive information technologies offer exciting prospects for social education - for supporting journeying in the vital and multi-dimensional fields of social inquiring, analysing and understandings.

Students can set their own pace, and control their own investigations. They can interact with evidence and information and build their own understandings and explanations. Examine what was thought and written; what was seen and pictured; what was heard and recorded. They can explore interactions between people in a range of situations and circumstances. They can study how actions were related to ideas and perceptions shared by the wider society. They can build their own explanations of how people thought, perceived, and acted in that time and place. In so doing they will be enriching their understandings of how individual selves - including themselves - are always participants in wider social settings, communities, and networks of shared ideas, perceptions and cultures. By learning more about others, they will learn more about themselves. By studying past experiences, they will learn to see their own experiences and situations in new ways. As the Japanese say, "visit the past to know the present".

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