

Computer-based Tutorials and Explorations in Hong Kong

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Abstract

This project adopts a student-centred approach to learning. It aims to facilitate students' conceptual understanding of social science, especially Sociology. Rejecting classical 'lecture and readings' approaches, it focuses on building a self-learning series of programmed units based on visual and textual images. The programme is driven by HYPERTEXT on a Macintosh platform and enables students to move at their own pace through a self-learning process. In the programme, students confront two sorts of materials identified as 'Tutorial Format' and 'Image Format'. These materials work in different ways. In the Tutorial Format, the units seek to explain and illustrate concepts by providing terms, definitions, illustrations and examples which link abstract ideas to the everyday experience of students and/or force them to recognise cultural practices outside the Asian environment which have theoretical links to practices found in Hong Kong. In the Image Format, the units start with images, which students are invited to explore in a way that enables them to comprehend the way in which 'social reality' is interpreted. The units incorporate a number of 'buttons' which enable the students to obtain 'pop-up' definitions of key sociological terms. These terms are defined in English and Chinese, with the English version including a soundtrack to aid students' pronunciation. The final form of the units has emerged, and in some cases is emerging, from a series of discussions with students that incorporates ideas which students have offered in their evaluation of the programme. The future aim of the group is both to increase the range of units available and to explore their use in a tutorial situation using multi-media projection.

Background

In our initial discussions we focused upon techniques of student learning, reflecting both our own experience with students and with more formal theories regarding the learning process. It became clear to us that the current generation of students was accustomed to learning with a combination of audio and visual stimuli and was not always comfortable with textual material alone.

Furthermore, many of these students had restricted knowledge of societal processes, both within and outside Hong Kong. This limited knowledge hindered their ability to link theoretical ideas to real life situations. Such handicaps posed problems for in depth learning.

As a way to bridge these problems, the team developed visual (pictorial and diagrammatic) material in sequence with textual material to illuminate concepts and arguments. The team experimented with two alternative formats:

Visual image as *illumination and elaboration* of tutorial material - we refer to this as **Tutorial Format**.

Pictorial image/visual stimuli as a *starting point* for exploration of concepts and relationships. We refer to this as **Images Format**.

Developing the Tutorial Format.

Starting from material which had been designed for other purposes, such as lectures or tutorials, team members considered how this material could be re-ordered in such a way that students could explore the material at their own pace and in their own way. An early decision was reached to adopt a HYPERTEXT format with standardized screen design, icons and colours, which conveyed similar messages for each card in the stack/stacks.

Details of the Programme Developed

A programme was set up which opened with a main menu (**Main Topic Stack**) from which students could select units in the discipline of their interest. Students were then able to interactively explore these units.

The main topic stack contains a **Main Topic Outline Card** which provides entry to separate **Topic Stacks**. These Topic Stacks contain **Topic Outline Cards** linked to specific **Sub-Topic Cards**. (see diagram 1 below)

Diagram 1 : Overview of Programme

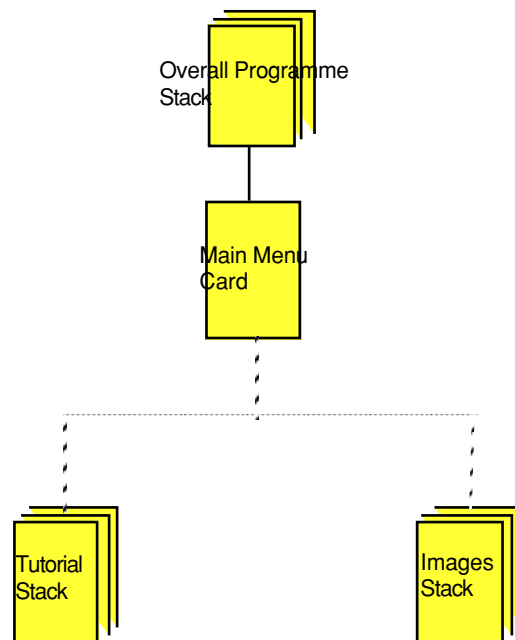


Diagram 2 : Elements in the Tutorial Programme

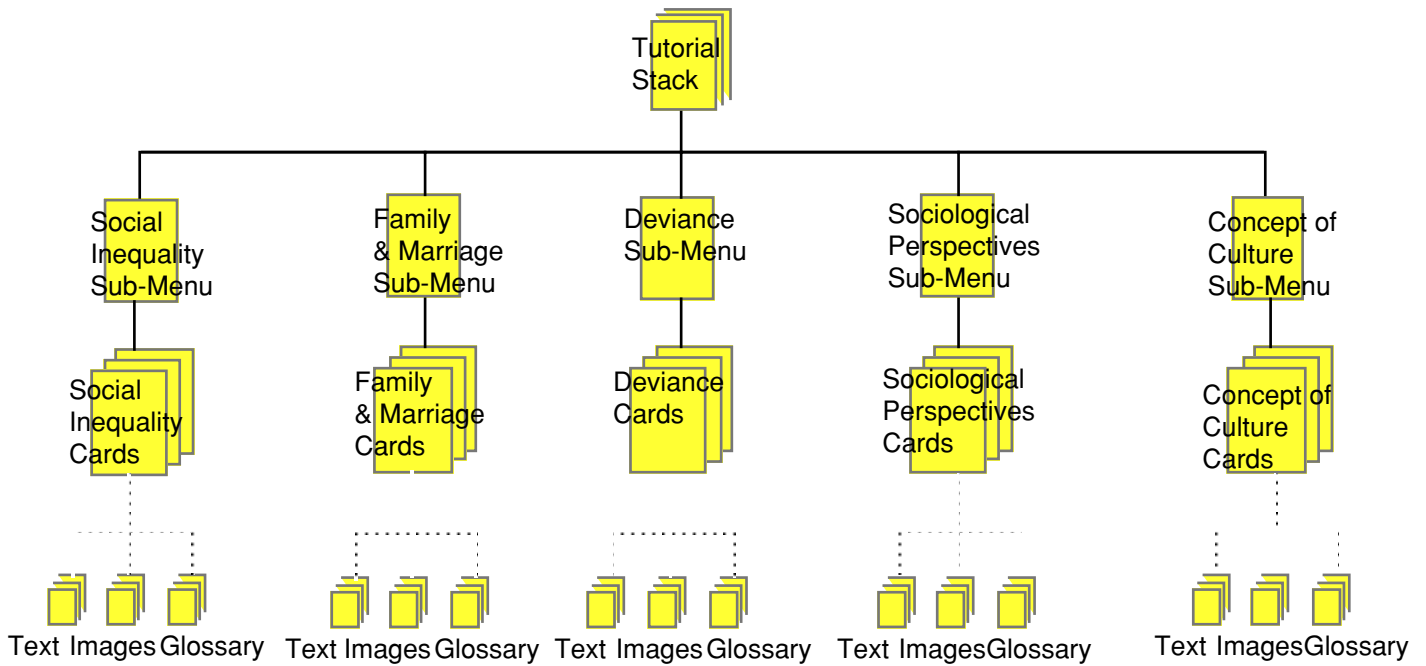
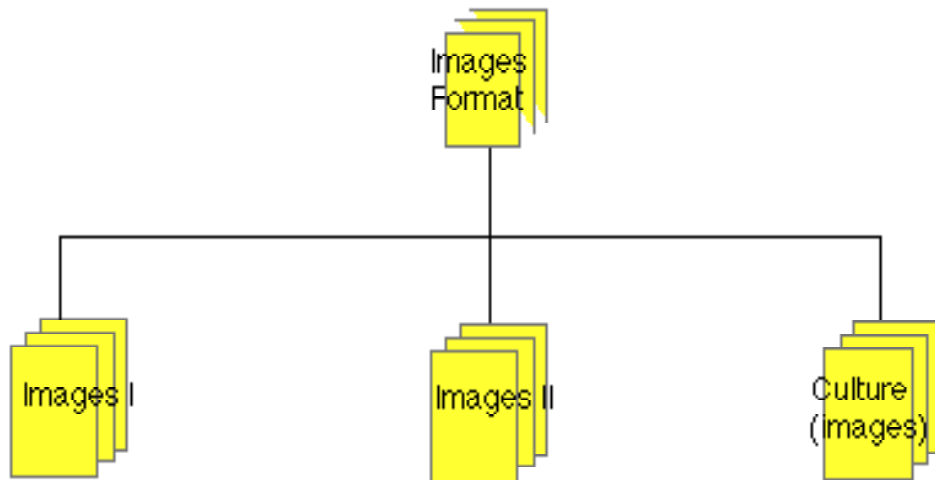


Diagram 3 : Elements in the Images Programme



For example, a student may choose a Main Topic Stack such as 'Marriage and Family' and then select from the Main Topic Outline Card the field which he/she wishes to explore, e.g., 'Family Composition'. There will then be a series of cards available for exploring that field.

Each card has information including 'pop-up' definitions of terms,⁽²⁾ and buttons⁽³⁾ allowing the student to move to **Pictorial Illustrations**, **Textual Quotations** or Sub-Topic Cards. An early attempt to provide a general glossary at the end of each Main Topic Stack was rejected in favour of 'pop-up' terms as students found this measure far more convenient to use. Also integrated into some of the tutorial units are **Student Interaction Cards** which provide limited self-testing exercises so that students can monitor their progress through the unit.

Future plans for **Audio Stimuli** (such as conversations and speech) and **Audio Visual Stimuli** (such as video clips) will also be linked to **Main Topic Outline Cards**. A file for **Student Notes**

may also be included. This file would provide the basis for students to keep their own records and develop material for term papers or project work.

Eventually, the team may develop a **Test Bank** which could include both multiple choice questions and more sophisticated stimuli such as video clips or texts to which students could be asked to respond.

The research team believes that this sort of support material will enable students working at their own pace to examine material and reinforce what they have absorbed from lectures and reading. Student evaluation of the intermediate development of the programme is included in the sections below. Improvements based on feedback from this evaluation have been included from the summer of 1996 and the whole programme has been further retesting during March and April 1997. (This element of the work is supported by a bridging grant from the HKBU Teaching Development Fund.)

Images Format

Preliminary work has taken place and a collection of around 600 photographic images have been transferred to CD ROM. These images have enabled sequences to be selected so that students can explore the sociological significance of social interaction in particular settings. By moving from familiar situations in Hong Kong, and emphasizing the process of interpretation, students have been encouraged to explore the ways in which they understand social situations. They have then been confronted with unfamiliar images from Hong Kong and elsewhere, and invited to interpret what they see. Clues have been provided and students have been encouraged to 'dialogue' with the computer until conclusions are reached. The significance of visible social indicators has been made clear and the importance of locating action in particular social contexts has been emphasized.

Difficulties and Problems

In interim reports, mention was made of problems relating to hardware and software. These problems have now been solved by acquisition of a PowerMac 7100/66AV for team use; HKBU's establishment of a PowerMac 8100/AV based Multi-media Laboratory for class use; and by the acquisition of HYPERCARD 2.2, Omnipage 5.0, Photoshop 3.0. and Authorware. The need to avoid infringement of copyright meant that initial manipulation of data was only possible on the project computer, a situation which created difficulties for some team members. This problem has now been solved by the acquisition of additional copies of needed software.

Initial difficulties were also experienced in obtaining suitable inexpensive and non-copyrighted images to illustrate units. Although suppliers offered a range of CD ROM images, it was not possible to identify suitable material for the project. The problem was partially solved by the decision to convert team members' slides and negatives to CD ROM format and by commissioning a series of cartoons to illustrate concepts, but further development of units depends upon the ability to obtain appropriate images.

The original Research Assistant was not readily able to handle the technical aspects of the project, but eventually after some delay, a new Research Assistant with qualifications in Computer Science was appointed and his work has enabled the project to progress very effectively. His resignation in September 1996 was related to uncertainty over funding of the project, but he has now been replaced by a third Research Assistant also with a background in Information Technology. (funded by HKBU).

All but one of the original team members have produced materials which were demonstrated to visitors at the University Open Day in October 1995 and to selected students in tutorials during the autumn term in 1995. Further major evaluations (involving some 144 and 850 student/unit assessments) were conducted in April 1996 and March/April 1997.

Currently evaluated units include:

Tutorials Format: Culture, Deviance, Family and Marriage, Social Inequality and Sociological Perspectives.

Images Format: Two sets of material known as 'Images I' and 'Images II'. The former includes a substantial amount of Hong Kong/China related material, while the latter involves images from a range of non-Chinese societies.

Morale among team members remains high and it is believed that useful research is being conducted. Three members of the existing team, Linda Lee (Sociology), Janet Scott (Anthropology) and Brian Ranson (Sociology), will be continuing in the second phase of the research and will be joined by Cheng Yew Meng and Leung Hon Chu from the Sociology Department.

Student Evaluation of Materials April 1996

Although various units were at different stages of completion, the team felt that it would be helpful to have a comprehensive evaluation of materials by different groups of potential student users. Testing was scheduled during a break in the semester that was provided to allow other students to participate in the Government Bi-Census.

Students invited to evaluate the units included all Year 2 Sociology majors who had studied 'Social Stratification' or 'Marriage and Family' and were not involved in the Bi-Census, together with all Year 1 Sociology majors and a selection of two tutorials of non-major students taking 'Introductory Sociology'.⁽⁴⁾ The possibility for bias in the characteristics of students completing the test exists, and is being checked by follow-up testing of those who 'missed' the first opportunity to evaluate the programme.

Although considerable care was taken to introduce the programme to evaluators as a potential benefit to students studying sociology, and to encourage students to treat the task seriously and conscientiously, it is clear from observations of the TAs and the RA that not all students were willing participants. Regrettably, some students did not take the exercise very seriously (e.g., they were not carefully reading the screen or concentrating on the tasks.) On the other hand, the non-majors who evaluated the material (in what would have been a normal tutorial time slot) were generally more positive about the activity.

This observation does limit the value of the data collected, but as all Sociology major students were interviewed by the TAs before leaving the lab, some of the qualitative data collected indicates their negative attitudes. This experience indicates that future testing will need to be incorporated into formal tutorial sessions rather than utilizing alternative opportunities for student participation.

Overall Evaluation

Technical and Physical

Testing was carried out in the new HKBU Multi-media Laboratory using PowerMac 8100/AV computers. Most students seemed able to follow the programmes, but a few 'got lost', or had

trouble getting back to the 'Main Menu' from subsidiary stacks. Some students who got lost did so because they impatiently clicked the mouse several times without waiting for an image to appear.

The team therefore needs to prepare clearer instructions (either on-line or as hard copy, or both, including HELP instructions) to provide guidance to the tasks and assistance when users get lost.

A number of students indicated difficulty in reading the screen text. Several commented about tired eyes or eye strain. Such difficulties may be actual, due either to choice of text size, font characteristics or background colour, or they may result from existing conditions of poor eyesight.

* The reasons may also be offered as a psychological excuse for low task concentration.

The team thus needs to further review the format for presentation of materials to see if improvements are possible. It may also be sensible to undertake some random evaluation of students' existing eyesight.

The General Features of the Programmes - What Worked and What Did Not

The combination of visual with textual material was well received by most students. Comments such as 'colourful and attractive' or 'more interesting than a textbook' reflect this conclusion. Equally important to many students was the 'systematic - clear - understandable' nature of the units and the fact that they included more information than lectures. The 'pop-up' (in context) definitions of terms was widely appreciated by students; as one commented '(one) can use button to call for material'. This method was seen to be more efficient than guessing at the meanings of words or using a standard dictionary. Students also appreciated the large number of examples in the text.

On the negative side, a number of students found difficulty in reading the text. For example, one student commented that 'too many materials makes one dizzy'. A number of students also indicated that they would have preferred a soundtrack in addition to the written text. (This point will be discussed in greater detail on pages to follow.) As a result, a soundtrack for English 'pop-ups' was produced.

The team must therefore further explore the links between reading skills, listening skills and levels of comprehension. Consequently, it is also important to understand the extent to which students feel that materials in the units are to be learned, rather than just being available to provide insight and understanding.

This issue is particularly significant with regard to the Images units, which were intended to help unravel the process by which members of a society make sense of the everyday world. This understanding was appreciated by some students who commented that the purpose of the unit it was to 'guide students in thinking' or to 'train students how to observe'. More specifically, the purpose of the unit was viewed as 'the application of sociological methodology to analysis (of images)'. On the other hand, some students were not so sensitive to the purpose of the unit, and commented that it was 'boring and unclear because there was no answer' or that it is 'difficult to find some words to describe the figures because the pictures are not clear'. A direct reference by a few students to 'alienation' from scenes from Africa or the Pacific and a request for more Hong Kong-based material misses the point of the exercise - which is not to get a description *right* but *to understand the processes by which the description is created*.

Much of this comment about the purpose of the units is also related to language and level of understanding of sociological ideas. Whilst some students were clearly very happy about what they found and felt that the units 'inspired one to think', others were confronted with learning

experiences which made the units difficult for them, e.g., one student commented that '(my) poor English makes learning difficult'. Some students also felt they needed more help; e.g., a student commented that 'more instructions should be given'. Other students seemed to possess a mentality that was not helpful to the task, e.g., one student felt that it was a 'bore to work with computers', while another commented that 'it is very boring, just like reading a textbook'.

Trying to organise these comments into a series of issues that can be addressed is not easy, but nonetheless several aspects emerged from students' comments which need follow-up action — the need for tutors to be available to provide guidance (which will occur in the next stage of the project using multi-media projectors in tutorial sessions); the desirability of having some Chinese material in the text; and the concern with learning and being tested.

The need for guidance, both to clarify the 'expected task' and to check on the interpretation of elements in the units, reflects some students' personal anxieties about what is required of them.

It may therefore prove to be worthwhile to run the first of the tutorials with a tutor present just to relieve anxiety (about getting it right) and to stimulate discussion and reflection (about what it is all about). However, ultimately the material is intended to be a 'stand alone' self-access package, so the team will have to give further thought to 'rescue' buttons for students who get lost. In any event, the team will need to further examine how tutors, computers and students can best be aligned.

The language of instruction also poses a great question — both in terms of objectives and in the technical provision of alternatives to English. Several students, when invited to respond to the question 'How could the unit be made better?' ('probe' use of Chinese text), replied that '... use of Chinese text is better/may be better/is best' or that '... use of Chinese text is better for understanding'.

Taken at face value, this response would seem to suggest that the team should relinquish English and switch to a software which could easily accommodate Chinese script. The problem with this response is that it ignores that the great bulk of material which students need to read is in English, and that a major part of the motivation for developing self-access tutorials has been to provide an environment in which self-paced learning in English could be undertaken.

Reflecting on the problem, the team felt that they should experiment with bilingual 'pop-up' definitions to see to what extent student concerns could be addressed. This experiment is now underway, and the strengthening of the team by the inclusion of two more Cantonese speakers has made this task much more practical. Initial reports from selective students indicate that these 'pop-up' definitions are likely to prove very popular, as Chinese language 'pop-ups' were highly rated by most students.

On the thorny matter of testing what is being learned, there seems to be two elements involved. One element relates to 'getting it right', i.e., correctly identifying and interpreting the elements in an image set. The use of 'buttons' to check this has been incorporated into some units, and the practice can be extended if advantages are perceived. The other element refers to the 'learning facts' for the test/evaluation approach'. At its worst, this approach can be related to the views of certain students that it is a waste of time to undertake any academic activities which are not directly related to graded work. In a milder form the learning facts for the test/evaluation approach relates to a concern for digestible chunks of knowledge which can be mastered and 'passed'.

How far this second approach should be encouraged is a moot point, but the frequency of requests for 'questions and answers' in students' comments does show that some indicator of progress might be desirable. Whilst such 'tests' might not be appropriate in all circumstances, they would clearly be helpful in some situations, which the team will need to explore further.

Student requests for sound effects with the text were interesting. At one level this request can be related to the total learning environment—one that includes instructional videos, documentary films, computer games and so forth. Students were simply indicating that by comparison with such multi-media encounters, the self-access Tutorials and Images were ‘boring’.

At another level this request was a plea for clarification and efficiency. Some students did have genuine difficulty in reading in English from the screen. Therefore, for these students the combination of text and commentary makes the task of comprehension easier. One of the team members noted in the lecture environment that due to students’ frequent mispronunciation of English when they read (or talk among themselves), ideas mentioned in English by the lecturer are not automatically linked to the written or spoken forms of the same ideas. In this sense, the request for the units to include both reading and listening can be seen not as a form of student laziness, but as a genuine attempt to maximize the benefits from ‘doing the unit’.

Progress has thus been made in introducing sound clips in association with the English ‘pop-up’ text, which has been greatly welcomed by the students testing the new material. However, two problems have emerged. The first relates to technical quality of sound, which was only marginally acceptable, while the second is the boredom of hearing one speaker. Over the next few months the team will be working with better quality sound equipment and will be recording clips from a series of different speakers.

This notion of maximizing study time is gathered from the frequent references to the ‘pop-ups’ as ‘convenient’ or more explicitly to the comment on the computer-aided form of instruction as one which ‘saves study time’.

Conclusions

The action learning project has been a valuable learning experience for team members as well as students. Considerable success has been achieved in developing and testing units. Moreover, areas for future development have been identified. New members have expressed an interest in joining the group and the whole project has served as an important focus for discussion of teaching and learning techniques.

Postscript

HKBU has provided further bridging grants (under its Teaching Development Grant Programme) to enable work on the project to continue until 30 June 1997. These grants have enabled further additions to be made to the programme of sound with English pop-up text and Chinese text as an alternative to the English pop-up text.

1. Evangelos Affendras (August 1995), Beatrice Chau (May 1996), Michael DeGolyer (August 1996) have now left the project. They contributed to the original material, but have been replaced by Cheng Yew Meng and Leung Hon Chu who recently joined the project (July 1996). Yiu Lee Man (Lam) has worked as Research Assistant from September 1994 to April 1995, Alex Ng from April 1995 to September 1996 and Felix Lee from September 1996 to March 1997.
2. Pop-up definitions are definitions of words or phrases in context. The text is highlighted (as a button) and definitions appear in a subsidiary box on screen when the students click on the term.
3. Buttons are small boxes included on the card. When the operator clicks them, entry is given to a sub-set of material. This sub-set may be textual information, pop-up definitions or images. Buttons also allow movement through the cards comprising the unit.

4. Details of students participation in the evaluation is given in the table below.

	Target Students N=	Students Completed Evaluation N=	Students in Follow-up N=	Missing Students N=
Sociology Major Year 1 Students*	38	31	3	4
Sociology Major Year 2 Students*	27	17	10	0
and Taken Family & Marriage	14	9	5	0
and Taken Social Inequality	21	14	7	0
Non-major Students Studying SOC1110	46	46	0	0

* not involved in Bi-census