SESSION 3

SYMPOSIUM: TEACHING

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Computers in psychology teaching in the U.K.

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This paper describes the first year of operation of the CTI Centre for Psychology, which promotes the use of computers in psychology teaching in the U.K. We outline current use of computers in teaching and some of the obstacles to the effective development of computer-supported courses. In particular, we focus on the need for closer integration of innovative forms of teaching into courses. We describe the Centre's strategy for supporting both conventional and innovative computer-supported teaching, and argue that effective use of software depends on both the instructional situation and the educational context.

In April 1989, funds from the U.K. government were made available, through the Computers in Teaching Initiative (CTI), to set up 21 centers to promote the use of computers for teaching in the U.K. university sector. Each center takes responsibility for a single discipline or group of related disciplines and provides support services to teaching staff within that discipline; the centers do not themselves develop software or conduct research.

The CTI Centre for Psychology, located at the University of York, started operation in July 1989. The Centre employs one full-time staff member and one part-time secretary, and receives support from the teaching faculty in the Department of Psychology. The CTI Centres were set up in a political climate that is placing increasing emphasis on the efficiency and effectiveness of teaching and on the evaluation of teaching performance. While the conditions of the award reflected this emphasis, it is important to resist simple assumptions about the relationship between computer use and efficiency; as with other teaching artifacts, computers' success depends on the wider educational context of use. This paper gives an overview of the state of computer-supported teaching of psychology in the U.K. and of the CTI Centre for Psychology: our aims, strategies, and activities.

Issues in Psychology Teaching in the U.K.

Within the university and polytechnic sector in the U.K., psychology is taught in 83 institutions by some

1,200 teachers. We have surveyed psychology departments both by questionnaire and through a series of informal workshops, and some preliminary results from this survey are presented below.

All institutions have access to a mainframe with E-mail and networking services; virtually all have some in-house microcomputer (or minicomputer) facilities. In most cases, microcomputers are used extensively by staff for word processing and other general applications as well as for more specific research purposes. The history of research use of computers has resulted in a higher level of computing skills among staff than is the case in many other disciplines. A range of hardware is in use. About 5 years ago, the dominant micro in British education was the Acorn BBC B (a machine of the same generation as the Apple II), and many of these are still in use in psychology departments, along with a smaller number of Apple IIs. Departments now favor IBM PC-compatible or Apple Macintosh machines, usually configured in networks (either for staff use or in teaching laboratories). Currently, PCs outnumber Macs for teaching by about two to one.

Of concern in this paper are the issues and trends that influence computer use in teaching. These can be divided into three classes: those related to teaching itself, those relating to departmental issues, and those concerning wider institutional and political concerns.

Teaching issues. The predominant use of computers to support teaching activities is as a tool. Many departments have set up computerized laboratory classes for practicals, which, in theory, may permit better use of the lecturer's time by requiring students to follow a cookbook approach. However, if the practicals are poorly integrated

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into the course as a whole and without clear pedagogical objectives, then this may well result in poor learning. This raises the more general issue of when computers can be effectively used as substitutes for the teacher and when they should serve as artifacts to support better communication between teacher and student or among students themselves.

All departments of psychology in the U.K. use computers to support the teaching of statistics, in most cases using conventional statistical analysis packages. Although there is some software that has a tutorial function, this is generally unknown and unused; this is an area where we hope to see increasing tutorial applications. A number of more specialized areas require the use of computer-based techniques, such as automated testing, AI, expert systems, neurocomputation, and HCI. In general, there is a considerable amount of expertise in these areas, which therefore require less direct support from the CTI Centre.

Despite considerable tool-based use of computers in teaching, applications for delivering course materials—whether through conventional CAL, demonstrations and simulations, or hypermedia-type approaches—are relatively rare. For instance, at the time of our survey, only 4% of departments reported using computer-based demonstrations. However, such usage is increasing, partly through information provided by the CTI Centre. Use of these more innovative forms of software raise questions about the optimal strategy for integrating computer use into courses and, indeed, for blurring the traditional boundaries between topic areas. Psychology is well placed to exploit the tutorial uses of computers, not only through its subject matter (which is, for example, well suited to demonstrations of phenomena and representation of dynamic processes), but also because, as psychologists, we should be well placed to apply the findings of our own discipline to the design of teaching materials and to the best educational use of computers in particular.

A great variety of software is in use in departments, with few packages common across the majority of institutions. In many cases, in-house software has been developed for particular courses, either through lack of knowledge of what is available or because existing software is felt to be inflexible or inappropriate. It is rare for teachers to adopt a commercial package wholesale; they are more likely to extract sections relevant to their own courses and to link it to their own introductory documentation. For this reason, they may be reluctant to purchase commercial courseware. However, the consequences are that much effort is expended in re-creating software that already exists in similar form elsewhere and that, because of lack of resources or limited view, some of this software is of poor educational quality. There is a clear need (which we are starting to address) for supporting the dissemination of information about good in-house software and its development to a standard where it can be distributed.

Computer use in psychology teaching, then, is still seen as an aid to conventional teaching methods (laboratory classes can be conducted more efficiently, results analyzed more thoroughly, new skills taught) rather than as a basis for innovative teaching or as a way of radically changing the nature of teaching practice. There are, of course, exceptions, but the potential for developing novel methods is largely unrealized.

Departmental issues. While there may be a good deal of individual enthusiasm for and commitment to computer-based teaching, this is often not well supported at a departmental level. An individual who develops innovative computer-assisted courses or spends time creating new software—perhaps for use by other staff members—is unlikely to be given time off other duties or increased chance of promotion. This is because credit is traditionally awarded for research performance, although the current political climate is starting to bring about a shift of emphasis. Also required is an awareness of the need to allocate resources to support computer-based teaching and a strategy for tackling the inertia and staff resistance to innovative methods. This is often more a matter not so much of buying in technological solutions as of providing appropriate information (of available software and of pedagogical principles), of bolstering commitment to innovative teaching, and of building up a critical mass of computer usage by staff and students. Nevertheless, the resourcing required for setting up and running a computer teaching laboratory is considerable, not least in staffing.

Institutional issues. Few U.K. universities have a co-ordinated institutional strategy toward computer-based teaching. Some central infrastructure facilities (terminal rooms, electronic classrooms, etc.) and technical advisory services are provided, but there is little in the way of support for course development or advice on pedagogical issues. This is only to be expected, given that until recently the work of university computer centers has typically revolved around the provision and maintenance of mainframe-based services. This picture is, however, changing, with a number of institutions setting up computer-based learning units with the brief of promoting innovative methods of teaching within the institution. In addition, the development of campus network facilities, either through specific “electronic campus” projects or through the increasing spread network nodes, is resulting in a range of innovative forms of communication, both for teaching and for other purposes.

The consequence of this general picture is that even when facilities do exist, they may not be well used if staff have insufficient time or motivation to develop novel teaching approaches or have insufficient educational or technical knowledge. Once the teacher deviates from the straight and narrow of conventional teaching methods, difficult questions about educational goals and criteria need to be tackled. The situation is not helped by the generally poor institutional rewards for work on innova-

tive teaching, especially when it is hard to publish the results of such work in research journals.

Strategies for Supporting Computer-Based Teaching

From the brief discussion above, it is clear that there is a wide range of factors that influence computer-based teaching in psychology. Certainly, there is a lack of information among lecturers, departments, and institutions, but more important may be changes of attitude toward teaching practice and policy.

Within the limited resources of the CTI Centre, we have adopted a strategy of helping lecturers to help themselves. The Centre aims to provide information to lecturers, departments, and decision makers, so as to have the greatest impact on the development of effective computer-based teaching. We specifically target activities at three levels of audience: (1) individual lecturers who are responsible for day-to-day teaching, (2) nominated departmental representatives who serve as advocates on our behalf, both to lecturers and to decision makers in their institutions, and (3) decision makers, such as heads of departments, policy makers, and relevant members of professional bodies.

Our two regular publications, *Psychology Software News* and *The CTI Directory of Psychology Software*, keep lecturers informed of current practice, of new ideas, and of software news. Information on forthcoming events is also provided on an electronic bulletin board. In addition,

we run specialist workshops to promote particular areas of development. Representatives in departments act as the focus of communication between the Centre and departments, and we have set up mechanisms for maximizing the exchange of information among departments through use of an E-mail bulletin board and a series of workshops for departmental representatives.

Other activities are aimed more specifically at promoting good practice and changing attitudes toward the use of computers in teaching. One means is to provide examples of recommended software and its innovative use with a disc-based "resource pack," which can be used by departments to introduce lecturers to the basics of CAL practice. Information for committees involved with curriculum definition or policy decisions within institutions can be highly effective in bringing about shifts in attitude. Other activities are directed at tackling particular problems. For example, a common difficulty is informing lecturers about software of potential interest. By keeping a list of where software is in use, we can put potential users in touch with current users. We also maintain an archive of software that visitors to the Centre can try for themselves.

In many ways, we are fortunate in serving a relatively small community of academic psychologists. We can forge personal and informal contacts with most departments, as well as build up a broader perspective on the directions that computer-based psychology teaching is taking in the U.K.