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On the Potential of Distance Education in the Age of Information Technology

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Abstract: *In any distance-education situation students and tutors are at a distance from each other at least in the sense that they are not in the same room while learning and teaching. This means that distance education relies on media. It has two constituent elements, on the one hand the presentation of learning matter, which can be described as one-way traffic, on the other hand interaction between students and tutors, which represents two-way traffic. Both are brought about by media. This was so a hundred years ago, when print, the written word and, occasionally, phonograph recordings exhausted the media repertoire, and does so now that a wealth of more and less sophisticated media are available. What, equipped with media of various kinds, distance education is capable of is the theme of this essay.*

Keywords*:* *K3* Computers and Education - *K3.1* Computer Uses in Education; *H5* Information Interfaces and Presentation - *H5.1* Multimedia Information Systems

1. Requirements

Any mode of education, instruction or training is expected to cater for reproductive learning, i.e. the learning of facts and the reproduction of what has been presented. The effectiveness of distance education in this respect has been shown to be outstanding [see Childs 1965 and Granholm 1971]. This is of very limited importance, however, as it is evident that students need more than such instructions as make them capable of providing the correct answers to factual questions asked. Students must acquire the capacity to abstract meaning from various more or less complicated presentations, they must learn to analyse and interpret phenomena, bring together relevant information from different sources, combine and synthesise what they learn in varying contexts.

In the so-called psychomotor domain little is usually expected of distance education. In a number of cases manual skills nevertheless have to be catered for (handling instruments, typewriting etc.). To what extent distance education should endeavour to identify and meet objectives in the affective domain, i.e. such as concern emotions and attitudes, is a contentious issue. The socialisation that is

usually expected of education seems much less important in adult education, the prime field of distance education, than in the education of youngsters as it is usually brought about in job situations and other parts of adult life. What is acquired is a kind of academic socialisation concerned with such things as the use of research sources, the conventions of intellectual discussions, presentations of investigations and similar matters. A moral upbringing, which can never be ignored in education, should probably be primarily focused on intellectual honesty, unbiased presentations of work done, proper references to sources used, the rejections of "cooked" data, etc.

2. Means and Media

To meet these requirements distance educators use the two constituent elements of their mode of teaching, a presentation of matter to be learnt, thought about, used and assimilated with the learner's intellect (and, often enough, emotions) as well as mediated interaction with students. Discussion must and can be catered for, not only in the sense that students are caused to mull things over individually but also as a real exchange of questions, ideas and arguments with a tutor.

This is by no means a new approach. It has been practised by responsible correspondence schools for at least a century. Nevertheless, there are new ways to bring it about. While a printed course (still by far the most common mode of presentation) and postal communication used to be the only really important media, students can now draw on computerised data bases for relevant items of information. There are possibilities for each student to find his/her own way through a subject area by means of so-called hypertext approaches, audio and video recordings can be used, interaction between students and tutors need not be delayed by assignments being sent by post but can benefit from telefax and/or electronic mail and, in the cases when students wish to work together with fellow-students, interaction between them can be brought about by teleconference or computer conferencing. Teleseminars are a reality of significance.

To meet limited psychomotor aims experimental kits and construction models combined with detailed written instructions have proved useful. TV and video recordings have been shown highly effective means for influencing attitudes [see Sparkes 1982, page 7]. On attitude change by means of distance learning see further Rogers 1986.

If student autonomy is seen as a desirable objective the possibility for each student to select information and find his/her own way through an area of study by means of hypertext systems is highly relevant, although free navigation may not suit learners with poor prior knowledge. The importance of this possibility is illuminated by the fact that many distance-teaching organisations consciously endeavour to promote a high degree of autonomy [see Weingartz 1990]. Experience shows that in „courses aimed at making students more independent as learners a degree of control is placed in their hands; students learn control by practising control“ [see Isaacs

1990, page 86]. For student autonomy personal tutoring and counselling are evidently essential.

3. Student-Tutor Interaction

Helping students to apply deep-level processing of what they read usually requires personal interaction with a tutor. This is by no means a controversial statement, but nevertheless it includes a bone of contention. It is sometimes taken to be an argument in favour of face-to-face sessions while it is evident to anyone aware of the potential of distance education that the interaction can, is and in many cases must be brought about by non-contigous means. Assignments for submission can, if developed in a way encouraging students to analyse, summarise, draw conclusions etc., be effective educational means which challenge them to think and judge independently. Assignments of this kind are no mini-examinations; they do not ask for information contained in the course materials but require students to use the subject matter presented for operations of the kinds indicated, i.e. to practice cognitive skills such as producing new forms of knowledge out of existing knowledge [see Chang et al. 1983, page 15].

It is evident that assignment tasks of these kinds cannot be developed as an add-on routine matter; they require much thought and creative imagination. It is equally obvious that the distant tutor's work is important, indeed, and thus must be allowed to be relatively costly. We do have experience of excellent assignment quality, first-class tutoring and other kinds of effective student support, but I am afraid we must recognise the sad fact that the opposite is equally well known. We need not look far to find types of distance education that represent little more than one of its constituent components, viz. one-way traffic through course development. Here the course „package“ conveying information is practically all, whereas the two-way traffic through which student-tutor interaction is brought about is reduced to a checking instrument which requires the services of correctors rather than tutors. This deplorable practice seems mainly to cater for knowledge transfer "from one vessel to another" and largely neglects focusing "attention on the intellectual and emotional development" of the distance student [see Fox 1983, p. 151].

Dispensing with really educational non-contiguous student-tutor interaction seems to reflect lack of belief in distance education. It invariably causes insistence on supplementary face-to-face sessions also in cases when neither skill training, nor social considerations demand the physical presence of tutors and students on the same premises. High-quality distance education without any doubt requires stimulating non-contiguous student-tutor interaction. It is brought about by postal correspondence, by telefax and/or electronic mail, on the telephone etc. What is always important in this communication - independently of medium/media used - is that tutors use a friendly and personal tone making students feel that they are

accepted partners. Mediated student-tutor interaction has proved a valuable means to support students' learning and develop their cognitive skills. This is of decisive importance for the potential of distance education.

A new dimension has been added during the last couple of decades through the introduction of teleconferences- and a-synchronous computer conferencing. They open new possibilities for non-contiguous group interaction. The former has proved particularly useful for seminars, the latter also for informal contacts between fellow-students [Mason & Kaye 1989]. However, what in the context of student-tutor interaction is above all typical of the potential of distance education is its almost unique one-to-one relationship between one student and one tutor (along the lines of Oxbridge tutorials).

4. One-way Traffic - Presentation of Learning Matter

Naturally also the other constituent element, the presentation of learning matter, is crucial for the potential of distance education. The quality of this one-way traffic is in most cases superior to that of the communication component. Here several of the distance-teaching universities excel (which may be rightly said also about the student-tutor interaction and other student support emanating from, for instance, the Open University of Israel and the United Kingdom Open University).

The question arises, however, if the all-embracing, self-contained, printed (and, possibly, recorded) courses are the ideal forms for presentating subject matter in distance education. While their effectiveness has been shown to be great, their suitability for engaging students in examining conflicting approaches has been queried. A self-contained course usually covers everything the student has to learn and practice and does not cause him/her to consult other sources. It can easily become autocratic, telling students not only what to do but also what conclusions are the proper ones, and deprive them of the exercise of criticism and personal judgement. Course writers have to be particularly careful here and make sure they engage their students in scrutiny of arguments and/or other activities that develop thinking and skills.

An alternative approach that can be regarded as a step on the way towards more academic study implies developing courses that function as study-guides to set texts. These may consist of articles and extracts from books through which students get into direct contact with authoritative specialist writings. Such texts are often reproduced in so-called readers. Sometimes photocopies of recent contributions to learned journals are also distributed to students. The study-guide approach is likely to promote plurality and can be used to support students' independence, but it is not intrinsically superior to traditional course development. If only one textbook is used there is merely a technical difference between the study-guide course and the self-contained variety. The study-guide approach is particularly useful in cases when

conflicting theories and arguments are to be studied. Then extracts from original texts are usually better than reports written by course writers who may be tempted to summarise the different views and then tell students what to accept and what to reject instead of underlining arguments pro et contra and causing students to consider and come to conclusions on their own. This approach illuminates how the intrinsic potential of distance education can be applied to academic skills and socialisation.

In the age of information technology study guides helping students to use data bases may serve academic ends by causing them to search for, compile and evaluate information, to analyse and use it in its proper contexts.

5. Overarching Aspects

High quality can be attained by exploiting the potential of distance education as far as possible. This primarily means giving would-be students a wide choice of possibilities. These can include permission to start, interrupt and finish study at any time that suits the individual, which needs must lead to flexible arrangements for examinations, i.e. several examination periods per year. It also means that students are allowed to study at their own pace and that individualised study is welcomed as well as peer-group interaction to the extents that individual students prefer. Computer conferencing paves the way for this.

Modern technology offers valuable approaches today and promises a series of new possibilities. Tony Bates, a leading distance educator specialising in modern media, forsees that within the next ten years the following developments will apply to everday life in developed countries:

- integration of television, telecommunications and computers, through digitisation and compression techniques;
- reduced costs and more flexible uses/applications of telecommunications, through developments such as ISDN/fibre-optics/cellular radio;
- miniaturisation (tiny cameras, microphones, small high-resolution display screens);
- increased portability, through use of radio communications and miniaturisation;
- increased processing power, through new micro-chip development and advanced software-techniques;
- more powerful and user-friendly command and software-tools, making it much easier for users to create and communicate their own materials.

[Bates 1995]

Multimedia networks are expected to lead to or facilitate educational innovations.

Various methodologies promote the exploitation of the possibilities inherent in distance education. Instructional design may indicate useful procedures and suitable choice of media [see Parer 1988]. However, what is useful and practical always depends on the prevailing circumstances, on the students, subjects, levels, study conditions and various frame factors. Apart from what has been said above I wish to point out two lines of thought which may be fruitful.

The first is the realisation that students learn different things from the same course. We all interact with what is presented to us in different manners. This is really nothing remarkable. When we read or in other ways come across information, theories or arguments we automatically relate them to what we already know, think or believe. When we learn something new we include it in the cognitive structures we have already developed. These are widened by new knowledge. Present-day psychologists often stress that each learner constructs his/her own knowledge by individual interaction with subject matter, but there is also a social dimension as human beings influence one another [see Educational Technology XXXI, a special issue on the implications of constructivism for educational technology]. One consequence of this contructivist view is that teaching, which really means facilitation of learning, must be characterised less by control and authoritarian intervention than by the creation of conditions conducive to learning, which, following Jonassen's definition of knowing, we may regard as „a process of actively interpreting and constructing individual knowledge representations“ [see Jonassen 1991, page 5]. These conditions, which can influence results strongly, have practical, administrative as well as ideational elements. Here belong on the one hand such things as suitable learning materials, easy communication, practical media and helpful administration, on the other hand a spirit of intellectual search and pleasure, friendly interaction and cooperation.

The second line of thought I wish to call attention to is closely related to the first. It is what I have called the empathy approach. In agreement with common sense and everyday observations I assume that feelings of personal relations between student and teacher promote motivation, study pleasure and effectiveness. Such relations can be fostered not only by personal interaction, i.e. *real communication*, but also by a kind of *simulated communication* which can be brought about by a personal style of presentation that attempts to involve the student emotionally in the study and by a conversational manner of writing which consistently addresses the individual student and asks for his/her reactions, views and experiences. The gist of this thinking is that empathy between on the one hand the student, on the other hand the writer, the tutors and others in the supporting organisation should be developed and made visible. A theory to this effect with an operalisation of the concept I have called simulated didactic conversation has been developed and empirically tested [see Holmberg, Schuemer & Obermeier 1982, Holmberg 1989 a, page 44 ff., and 1991]. This theory primarily bears on course development; another study, Rekkedal 1985, indirectly testifies to the relevance of the empathy approach to student-tutor

interaction. There can be no doubt about its value for both constituent components of distance education. It thus contributes to our estimate of the potential of distance education.

6. Conclusion

The potential of distance education can be described in terms of
- flexibility and student autonomy
- academic quest, use of sources, analysis, interpretation and synthesis
- methods and media.

It basically depends on the communicative character of distance education, which can be said to include both real and simulated communication. Communication in both its forms serves intellectual development, deep-level processing, the activation of cognitive skills and other truly educational purposes.

The potential of distance education is enhanced by the use of information technology and modern media. It is exploited to varying degrees. Flexibility as to pacing etc., hypertext approaches, suitable media, courses functioning as guides to selected texts, discourse and empathy, assignments training cognitive skills, undelayed student-tutor interaction (by fax or e-mail, for example), teleconferences and computer conferencing, aspects of conventional instructional design and constructivist approaches encouraging students to build their own knowledge representations contribute to the full exploitation of the potential of distance education.

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