What are the factors that influence the development of open and distance teaching?

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An answer to this question requires a distinction between several aspects:
(a) The new technologies, but at the same time the relativising of their "novelty" aspect;
(b) The transformation of information technologies into training technologies;
(c) The development of teaching methods;
(d) The corporate culture.

And, finally, we could briefly present a picture of the situation obtaining in Switzerland.

The new technologies: variety of objects, variety of uses

Let us first of all point out the diversity of designations - new communication and information technologies (NCIT), new training technologies, etc. - which are applied to a host of technical objects with, in fact, very different functions; DBS television and high definition television, interactive teleconferences (picture and sound); telematics, videodisc, the digital service integration network (DSIN), the different forms of teleloading, of distance consultation and transaction; in the image field, the digitizable magnetic-medium camera, the videodisc, the CD-ROM, the CD-Worm, the CD-I and DVI, virtual worlds, etc. Each of these involves specific aspects: telecommunications (broadcasting, circulation and reception); digitization, storage and modification of the image; creation of enactsments, etc. We are in the midst of a situation which the sociologist A. Moles has called "communication opulence". The supply of technology is apparently far greater than the needs, which means that the user needs to be more selective and adopt adequate strategies.

The transformation of information technologies into training technologies.

The means of communication and broadcasting have always occupied a core role in this training mode; the post, of course, which was its first vector, and later, the telephone or radio and television. In this respect, it should not be forgotten that the traditional distance education institutions - the public services' correspondence teaching institutions - have sometimes been described as the "conjunction of a school and a post office". We should not be astonished then that Distance Training should be enjoying a marked renewal now that telecommunications are booming and remote-access computing has produced a radical upheaval in our way of exploiting, broadcasting and circulating information.

Yet even if these technologies do permit a wide distribution of training and information material, it is not enough just to inform and broadcast. The main danger is to think that by distributing information or course manuals, we are training. There are two problems facing us: the need, on the one hand, to organise a learning environment and, on the other, to take into account the methodological aspects involved in the specificities of the technologies employed.

The evolution of teaching methods: teaching vs learning

A new vision has developed during the past 15-20 years, drawn from the social and cognitive sciences. The educational system and practice now focus on on learning more than on teaching. New developments in the theories of learning have changed the nature of learning and learner. On the one hand, knowledge is considered as "socially constructed through action, communication and reflection involving learners." (Pea, 1992: 77). On the other hand, the classical view of teaching as telling or delivering curricula has turned into a new view of "modelling expert practice and promoting learning conversations that negotiate meaning to promote change in learner concepts and strategies toward proficient performances." (ibid). Distance education, as is normal, has been involved in this general stream. For instance, teachers will gradually become advisers, managers and facilitators of
learning rather than providers of information (Bates, 1993).

The trail left by this general trend can be clearly seen in the terminology. In French, for instance, we used to speak about "enseignement à distance", that is, "distance teaching", but now we speak about "formation à distance", "distance training", or "apprentissage à distance", "distance learning". The same changes can be found in English; "distance learning" has replaced "distance education". European terminology, too, reflects the same change. The title of EEC report SEC (91) 897 is "Open and distance higher education in the European Community", whereas the title of the famous memorandum is "Memorandum on open and distance learning in the European Community". We can say, then, that the official European stream has taken note of this major development.

Where do we stand?

(a) Results
(b) Distance Learning & the Production and Use of Resources

Results in the Swiss universities

A study was carried out on behalf of the OFES (Federal Office for Education and Science) in 1990-91 (it should be updated in 95). It enabled us to identify a certain number of projects falling within three major categories: engineering, self-training and distance training (DL).

- Engineering: there are many technological projects in telecommunications departments and in computer laboratories. The common characteristic of their products is first of all the solution of technical problems; the improvement of videotext graphic capacities, the software architecture of an electronic book, the creation of interfaces, of image digitization or compression techniques, etc.
- Self-training presents a large number of projects for the production of self-teaching material. These are information documents or self-training information freely accessible in resource and pedagogical material centres (media-libraries or computer rooms); sound-trackd slide presentations and video tapes, computer-assisted learning software (for example in the Computer Assisted Teaching Laboratory of the Lausanne Federal Polytechnic School), interactive videodiscs, hypermedia (Neocortex, Bale Projects) and the multimedia courses (Chair of Didactics; EPFL).

One comment. We find it useful to maintain the important distinction between the two types of material; information and training. The first is essentially intended for information in its various forms; popularisation, motivation, illustration, sensitization, realization, etc. The second is characterised by the development of a coherent, interactive learning strategy based traditionally on the following stages: presentation of the information, assignment, assessment, feed-back. This type of strategy in concrete terms implies a gradual learning process, the making of support and synthesis files, exercises, self-assessment procedures, etc. All these projects end in the
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creation of pedagogical material which can be integrated into the framework of a distance training system. In fact, this material has many didactic and methodological aspects in common with DL since it, too, has self-teaching in mind. It is, then, an important source of learning aids for DL, even if it often has to be adapted.

### Distance Learning Projects

It has not been possible to identify many projects deriving from DL stricuo sensu. In each case these are one-off experiments. Let us mention the retransmitting of courses in the form of interactive video-conferences experimented in the teaching resources centres of the Medical Faculties of Basle, Lausanne and Zurich, in the Federal Polytechnic Schools or in the Faculty of Economic and Social Sciences of the University of Geneva. For secondary education schools, we should mention the multimedia prototype commissioned in Geneva by the Tele-teaching Commission, or the numerous initiatives in the scholastic telematic field of the CIP in Geneva.

#### The production and use of resources

There are several problems which I would like to raise:

- we should first make a distinction between (1) the broadcasting and bulletin-board technologies (this concerns the production-transmission-broadcasting technical level), (2) the representation mode specific to didactic messages (their visual, graphic, sound form), (in other words the different languages or symbolic forms used to convey the messages), (3) the mental representations and the cognitive processing of the information. Each of these levels has its questions, its problems but also its specific fields and disciplines; technique, semiotics and psychology. A coherent structuring of these levels is essential if the problem is to be correctly presented. Among them, the choice of technology but also of representation mode according to contextual criteria (economic, institutional constraints, literacy and so on) but also according to pedagogical criteria (objectives, audience, assignment, etc.).

- a second important problem is the still high cost of the technologies. If the cost of the materials tends to decrease, that of the human resources remains high when we bear in mind the number-of-working-hours-invested/number-of-hours-produced ratio, whatever the media chosen...

- the third problem, finally, is that of the market for distance training pedagogical products; a market which is still far from being established. It should not be forgotten that distance training and self-training have much in common. In other words, the realisation that self-training material can be used for DL, for resource centres, could open up a wider market. Finally, the compatibility of computer systems is one of the conditions for the creation of this market; this is true of the traditional educational software and it is true of the multimedia productions whose potential is becoming apparent today.

- another problem, the balance between the methodological, technical and content aspects... not often fully achieved... The quality of the material produced depends on the balance between the different roles and functions of a necessarily pluri-disciplinary team. The survey mentioned above in the Swiss universities confirms these difficulties.

### Prospects

(a) Impact of distance training on face-to-face training
(b) Multimedia
(c) Societal problems
(d) Social uses

### Integration of the new technologies in face-to-face training.

Face-to-face training and distance training are always contrasted, but we tend to forget that even in face-to-face training, learners often have distance working periods when they are spatially and temporarily isolated. The home assignment is an excellent case in point. In fact, one of the important criteria in defining the type of system with which one is confronted is how much work is done at a distance and how much is done face-to-face. We can then see what is the degree of integration of the technologies according to this “distance vs face-to-face” axis and
analyze at the same time what their own peculiar functions are. The Machina Carnis multimedia software used in Geneva in the second year of medicine for the teaching of physiology is an interesting example of the integration of a technology within the framework of a multitechnical teaching environment, that is, alongside the overhead-projector, the TV, etc. But it is wholly integrated into a classic scenario of teaching by lecturing; using this programme, the teacher can integrate demonstration, explanatory and simulation sequences. We can see the potential of the technology but in a quite traditional pedagogical use. Moreover, this software is used for practical work in assisted self-training (tutorials) and is available in self-service in a resources centre. Finally, it will doubtlessly soon be available experimentally on the university network.

There are several other comparisons to be made between these two modes of training. The rigour of the mediatisation of the contents of the teaching and of the production of material for distance learning often has a positive impact on those who teach "face to face". In fact it is often the same persons who, as part-time lecturers, write distance training material. They learn a new methodological rigour and return to "face to face" teaching with an additional methodological experience.

Multimedia

My first question will be, "Is multimedia a new media?" That is, is multimedia a media and is it a new one? Perhaps the answer could be found by putting the question differently, by asking, "What is multimedia?" A first answer could be, "Multimedia is the integrated use of sounds, images, music and so on." Can we define multimedia in these terms? Of course not. These are not sufficient elements to compose a new media. If they were, movies which include sounds, music, voices, spoken language and, of course, images, would be multimedia products... perhaps they are!

Multimedia is one of the most useful and powerful aspects of communication practices which uses images, graphics, representations and so on. But multimedia is a powerful means to achieve different goals and aims. In other words, it is my belief that multimedia cannot be considered as such, for by itself it does not constitute a field or a scientific domain. We have to analyze it in connection with its fields of application. The technology per se is not the central issue. It is the specific kinds of activities which involve the technology which will be likely to pay off.

What has not changed with the widespread availability of these tools is the need to apply both:
- basic pedagogical consideration when creating a learning environment using sounds and images;
- basic design considerations when creating visual and sound aids.

Why do students learn? What do they want? In the university context, for instance, we can discern two main trends related to two kinds of (re)training needs. Some students are interested in a complete curriculum to obtain a new degree, a new diploma, others want to acquire new knowledge, a new qualification related to their professional career. In the field of distance education, with these two kinds of needs we can draw a dividing line between two types of learning projects that can be developed by two particular types of institution and organisation.

Societal problems

- Is the role and social function of technology in a development perspective, a step toward democracy?
- How can we organise an equitable appropriation of technologies according to the different social, professional and cultural strata of society? (Capecchi, Pesce and Schiray, 1988)
- Power and transformation of the social and relational tissue - what is at stake.
- "Communication machines" - the symbolic stake.

If we concentrate more particularly on these last two functions, we will further note that "they (the communication machines) are intended to regulate the imbalances of society and act as reassuring and tranquilizing machines. Since the inventors endow them with a role which extends beyond the technical field into society overall, these machines, like magic wands, work for its well-being." (J. Perriault). And among the telecommunications technologies, the network phenomenon gives a clear illustration of this analysis; it...
has, moreover, given birth to an exemplary mythical configuration. The networks are part of the idea that technology has a decisive role to play in social change; they are considered as a place where social issues are recompensed (which presupposes a state of deliquescence or disintegration) and where social relations of a new type are forged. They permit and even encourage new forms of social networking based, for example, on interactivity and de-territorialisation. The Swiss French-language newspaper Le Nouveau Quotidien a short while ago published an article on this topic. The fact that it was a popularization or a mass-circulation article in no way diminishes the relevance of the example. Quite the contrary, such articles provide the mass public with the echo of a scientific conception and clearly support the mythical idea that progress and, hence, technologies, are revolutionary and not evolutionary.

Social uses

As for social relations, they would be radically transformed. The communication systems should eliminate the power relationships between public services and the citizen. Since citizens will no longer be obliged to go themselves to the various offices in town to collect the documents necessary, for example, for a marriage, it would be the registrar's job to get the documents himself without leaving his office and without turning citizens into couriers before performing the marriage. In all these cases, it is mainly the existence of the chiefs and the little chiefs which would be threatened by professional changes and distance work; where there is no physical presence, there are no more power relationships.

If social relations in the workplace will certainly be changed by the possibilities of distance communication, and hence by teleworking, it is not sure that the power relationships will disappear. Studies have shown that the introduction in France of the minitel, the home terminal of the telecommunications system, has helped to reinforce power relationships, the distribution of family roles and sexual discrimination within the family tissue, the first ecological niche of remote communication. During the early development stages of the Teletel at Veïzy, for example, the mastery and appropriation of the tool was the stake of widespread competition between the members of the family.

What will become of professional practices and of family sociality when the home really becomes the workplace? No-one can yet say, but there is the risk of seeing a further reinforcing of family discrimination relationships on a professional basis. The point is that technologies may well promise utopias but we also know the fate reserved to these latter by the social system. Moreover, we also know that the advocates of horizontal communication and net-work-development linked democratization believe paradoxically that technologies can lead to greater social control. There is nothing astonishing in that, since the technicisation of our environment leads inevitably to its politicisation.
Contextualized viewpoints on Learning Technology