

# Distance education – a response to social needs or technology in search of application?

BY ERLING LJOSÅ

One of the Norwegian painter Edvard Munch's pictures, 'The Plough Team', shows a man who is out ploughing. He has two sturdy horses drawing his plough, one is black, the other white. They are harnessed together, but in the picture it appears as though each is pulling in slightly different directions.

The development of technology is indeed a part of the development of a society, but even so we can sometimes feel that technology is an uncontrollable member of our 'ploughing team'. It is therefore a relevant question to ask: is it society's real need which is decisive in the type of distance learning that is on offer? Or is distance learning to some extent a technology driven invention in search of relevant application?

This question of the relationship between technological and general social development in connection with distance learning is indeed tightly knitted. There are few, if any, social researchers who have been interested in this subject, so there are few research or literary sources available to lean on. I shall try to open up the topic in a few different ways – by looking at historical trends, some typical examples and a few personal reflections.

## The first technological stage – education by post

Bernhard R. Tynes started a furniture factory in 1927 in Sykkylven in Sunnmøre, when he was 20 years old. In 1930 he expanded and built a new factory. When he was only 13 he had begun to make wooden buttons, and at 16, ski poles. He was one of the founders of the 'industrial fairytale' in Sunnmøre.

In 1934 Tynes took a correspondence course in technical drawing, freehand design and business accounting. His first technical education was from a carpentry college in Molde, but he gradually became aware of a need for further education in design as part of his job as manager of an expanding furniture factory ... Tynes himself designed the furniture which was to be put into production, and the factory in Sykkylven became a model company. [2]

More than sixty years ago we can already see that correspondence courses were used to increase competitiveness in small Norwegian companies. Indeed, corre-



spondence courses have been in use in such connection for over eighty years now, in Norway. Distance education, in other words, is not a recent phenomenon based on new technology. It has been in widespread use over large parts of the globe for the last century or more. Even so, from the very beginning, distance education has been affected by general technological developments. Pitman, the oldest correspondence college in Europe, was started in England as soon as the national postal system had been established. Indeed, the Post Office communication system was a prerequisite for the growth of correspondence colleges. This system still works extremely well, at any rate in Norway. It is cheap, effective and reasonably fast, and covers as near 100 % of the population as possible.

When Ernst G. Mortensen ventured to start NKS (the Norwegian Correspondence College) in 1914, the basis for his success was not new technology. He himself had no more education than a 6 months business course after a basic education, but he was desperate to start his own business. He took the initiative in a previously neglected area in Norwegian education, namely business education. The two first courses – 'Double entry bookkeeping' and 'Business correspondence' – filled a need for practical skills in a rich variety of establishments in many small local communities. He was lucky with his timing, for work was plentiful during the First World War. Mortensen

wrote in his advertisements and school timetable, "We live in restless times. Never before has work pressure been so intense as now, and never before has demand for skills been so high", and indeed he was correct. The need for working skills and education was acknowledged to an increasing degree, and the public at large was thirsty for knowledge.

The Norwegian school system was in no position to meet this need. Certainly, there were public schools and business schools in the larger cities, but very few people had either the resources or possibility of travelling from home to attend these courses. Loss of earnings, dear maintenance and school fees made it difficult for most. At the same time knowledge was an important prerequisite for higher paid work and social advancement. The two course offerings from NKS cost the dizzy sum of 40 kroner, at a time when a normal skilled workman's wage was about 0.50 kroner per hour. Even if that was expensive, school support costs were much higher.

At that time business education was the poor relation in the Norwegian school system. The industrialisation and development of business at the turn of the century created a large demand for training. Business education gradually came to consist of a range of short courses, from three months and upwards. At first it was mainly private, without state or local

authority support. In 1907, for the first time, there was a demand for some level of education or experience to gain a business certificate, and gradually there also developed a public demand for specific course contents. The Central Bureau for Statistics wrote, after reviewing the statistics for 1909:

“The available information shows that the overwhelming majority of businessmen have no specialist education, and that on the whole they are recruited from the lower ranks of society.”

Ernst G. Mortensen was successful with business correspondence courses, and from 1917 the range of courses offered was greatly increased, including technical and agricultural courses. In 1920 the college offered different courses and combinations for businessmen, shop assistants, bookkeepers, secretaries, council treasurers, bricklayers, carpenters, electricians, machinists and civil servants in the customs, postal and telegraph services. In addition, a course was developed to help in preparation for the Lower Secondary School examination, for those interested in raising their general standard of education. These courses were very popular with teachers – so-called seminarists – who wished to gain qualifications to teach at a higher level in the school system.

Obviously, the correspondence courses Ernst G. Mortensen established in Norway were not technology inspired. They had their origin in a social need for education and knowledge development, closely connected to practical work and industry. The geographical aspect, which is often stressed, was only one aspect of this social adaptation.

Correspondence courses built on a well understood technology, but even so, represented a pedagogic development that was truly radical. They were received on the one hand with praise, but on the other in the educational establishment, with scepticism, even though the ‘seminarists’ seized the opportunity for further education. It took eight years from the foundation of NKS before this style of education was even mentioned in the current education press.

## Technology and distance education

The postage stamp and a coherent price mechanism for *post* was one of the historical prerequisites for the growth of modern distance education. Another technological connection was the *printing and book trades*. Rightly so, there were a number of correspondence colleges which grew from normal schools, and individual creative operations with stencil machines and similar apparatus. But very often we find a connection with a publishing house. In Germany, Gustav Langenscheidt (later a well-known publishing name!) worked on a self-study course with a Frenchman, Toussaint, as early as 1856, and a book dealer called Hachfeld produced a course in technical skills from 1895 [7]. One of the largest and best known American correspondence colleges, International Correspondence Schools, was founded around 1890 by a newspaper editor in Scranton, Pennsylvania, as a result of a series of articles on worker protection in the mine industry.

Newspapers have had only sporadic impact on distance education, but on the other hand, connection to a publishing house has been common and lasting. Development and production of correspondence training material has a technological relation to both book and magazine production. Ernst G. Mortensen is a good example of this. He was engaged in book publishing and printing, and established himself as one of the major magazine publishers in Norway in the 1930s.

New media and technologies gradually created new opportunities for offering education. *The gramophone record* made inroads in language courses at Langenscheidt at least as early as 1906 [7], and obviously was a great stride forward in improving the practising of correct pronunciation. Later, the record was naturally replaced by tape and then by cassettes. These are media which integrate easily with correspondence courses.

*Broadcasting* on the other hand is a considerably different medium. The first attempt at schools broadcasting by radio came in the 1920s. The radio lecture was a popular programme format, and was early used to supplement correspondence courses, e.g. in Germany, Canada and Australia. Broadcasting has often been concession controlled and consequently

reserved for larger, national players. This is particularly so with television, which began in the mid-1940s. Here again education was an important element. For example, Chicago TV College in around 1960, was an important forerunner of the Open University. Right up to present times, broadcasting has a particular position in distance education, either as schools broadcasting, or in combination with correspondence courses and study circles [4]. In Norway, we experienced the first co-operative project in language education between NRK radio and a correspondence college in 1949, and since 1960, adult education via radio and television has been a continuous offering. NFU, the State Institution of Distance Education, was founded especially to organise this type of co-operative approach, in 1979.

*The telephone* had been in existence long before it was used for distance education. The first attempts were made as early as 1939, but its use became more widespread from around 1960, especially in North America [9]. The most common use today is in telephone conferencing. Even though the telephone has a place in distance education, it has never really taken off in the sense of having a central position. Even though it can obviously function well in telephone conferencing, it has its limitation as an audio based medium.

*Video* was a new wonder-child, much discussed in the early 1970s. Special companies were set up to develop and market educational videos. Today, we find little trace of them. However, video cassettes have acquired a foothold in education. We find both programmes of broadcast quality for a large market, and simple productions with recordings of lectures or a short introduction as a basis for group work. As a rule video is integrated with a more comprehensive educational project. The length of time it has taken for video to take hold has obviously some connection with price levels and how widespread video players have become.

In the mid-1970s experiments began with use of *satellite-carried* distance education in Canada and the USA. In some cases it was combined with a reverse channel over the telephone network, and a new form of distance education had been born. In contrast to the normal television it was possible to ring in during the broadcast, ask questions, or join in

discussions. The media was more interactive, and this interactive use of broadcasting has become quite popular, especially in North America [6]. In other countries, including developing countries, satellite is most often used only to carry television programmes, without interaction. In Europe, trans-national educational broadcasting via satellite was initiated around 1990, with programme input from educational institutions and free transmission time. Although funding vanished, transmissions continued at a lower level, and a number of national systems also exist. We also have some commercial, quasi-educational channels. In Norway, NORNET represents an attempt to introduce the more interactive style of distance education.

In parallel with satellite use, the television companies began to send *pictures over the telephone network*. It is possible to send pictures both ways, and multiple sites can be connected in video conferences. For a long time this was fairly expensive, but with steadily improving compression technology this development has led to the video telephone, at the same time as the ISDN network has provided a higher transmission rate. This means that cost is no longer the chief problem with this technology, but even so, there are limits when it comes to organising many participants and many sites simultaneously [10], [11].

*Computers* represent a technology that, so to say, has revolutionised the whole of society since the Second World War. Obviously, it has also been adopted for the administration of distance education. It has taken a longer time before IT made inroads for educational purposes. We may distinguish between two main forms:

- CBL – Computer Based Learning
- CMC – Computer Mediated Communication.

Computer based learning has never had a large application in distance education, for many good reasons. These include cost, lack of standardisation, little flexibility, difficult access to equipment, etc. In the 1970s, NKS developed a programme for correction and commenting of student replies, which can perhaps be considered in this category. It has not been maintained.

Use of computer mediated communication appears to have a larger application.

The first conference systems began to be used 10–15 years ago. American institutions again were the first, but there has also been Norwegian activity and considerable development [8], [12]. NKI introduced its own system in 1987, and NKS launched its ‘Electronic College’ two years later. The Ministry of Education had its own ambitious project in this field, and several higher education institutions became involved. The current NITOL project, with the colleges at Trondheim, Stord and Agder as central partners, is in some respects an outcome of the initiative of the Ministry.

Over the last few years it has become clear that the Internet stands out as a sort of common highway for most of what happens in computer mediated communication. The World Wide Web is just a few years old, but today it is the standard domain in the Internet world. In this way, de facto standards make it easier to develop distance education as well. Already today, hundreds of distance courses have found their way onto the international market through Internet. Also Norwegian institutions, among them NKS, prepare new and exciting initiatives in this area.

What we are now seeing is that many of the technologies I have discussed here are in the process of blending together. Databases, telephony, broadcasting, printing technology, etc. – they will all come to be based more and more on the same digital technology. Multimedia replaces the individual media we know today. That will have considerable and important consequences for distance education.

## Which training is suitable for social development?

What do we really mean when we say that education and training should be suited to the development of a society? Can we say that distance education as a form fills this need, and in particular, that distance education in Norway is suited to the social developments we see? It is easier to ask than to answer, but even so, I will try.

Just before Christmas 1995, the EU commission issued a so-called *White book on Education* [5]. That document pointed to many important challenges and aims which are relevant to education in a modern society. Generally, we can say that

education and training should serve three main aims: personal development, social integration and enablement for work and social life. How can we relate this to the current social developments?

The White book points to the multiplicity of factors that affect education’s place in social developments, and there are three chief factors that drive more in-depth changes than most. These are:

- Future growth of the information society
- Internationalisation of the economy
- The effects from scientific and technological inventions.

The social changes connected with IT are often compared with the effects of the Industrial Revolution. I am certain this can be disputed, but I am also certain that the effects are considerable. First and foremost, IT has changed work processes and the way we organise production of goods and services. Mass production is giving way to smaller, tailored runs. Work is being organised more flexibly, with teamwork and companies in a network. Job contents are more varied and demanding, at the same time as people become more dependent on each other in a complex system of functions. Much routine work is disappearing, and in its place more skill intensive work and workplaces are growing up.

If we see this in relation to education, it means obviously that the content of education should be re-focused, so that it covers the new skills needs. In addition, a technological convergence is taking place between education and the workplace. That will be meaningless if education continues to use a classroom and blackboard with a teacher at a lectern and students with desks in a row – if education should prepare us for life in a modern society. Computer tools and communications media ought to be natural aids, and training work ought to adopt project work, independent responsibility and cooperation on how to utilise the information resources available in our information society.

The second important factor the White book points to, is the internationalisation of the economy. We saw a clear illustration of that during the recent workshop strike in Norway. When the media talked about the problems of a long strike, it was not the national consequences that

were emphasised, but those for the car industry in Germany and Sweden, and the erosion of confidence in Norwegian industry internationally. We are all aware of the increasing difficulties we have in driving a national economic policy in a market which is more and more open to international competition. In addition, we should remember the cultural effects of the globalisation of society.

Again this development has considerable consequences for the education sector. It is not only the contents that are important, even more important is the considerable emphasis now being made – in all countries – that the education sector must contribute to enhance a nation's or region's competitive strength. Most economists believe that one of the most important competitive factors is a population's skill level. It is therefore believed that effort in education can also contribute to reducing employment problems, which has become a bugbear for our society. It is not enough in this connection to strengthen basic education in the normal education system, access to training and skills development must be available to all age groups.

The third factor mentioned, is current scientific and technological inventions. Here we meet a paradox, fifty to a hundred years ago most people regarded scientific progress as positive and promising. Today, we gain new knowledge at an increasing tempo, but at the same time it is increasingly regarded as a threat. Look at the environmental problems and the discussions on genetics. Much points to science and technology being split off from cultural development and basic ethical thinking. If we are to get everything in the right proportions before the next millennium, it is clear that the education sector has an important role to play. Above all, it cannot just offer more and more knowledge. It must contribute more than previously to creation of understanding for relationships, perspective and duties, across the traditional disciplines and cultures.

From these three factors we can formulate some general requirements for an educational and training system which is suitable for social development:

- Adopt available technology and available information resources
- Use workstyles which promote communication and co-operation

- Contribute to the fulfilment of skill needs in working life
- Provide access for all to a system of lifelong learning
- Link knowledge in working life and social conditions
- Give cross-disciplinary and cross-cultural understanding
- Strengthen a whole, social and ethical perspective.

### Does distance education satisfy these demands?

When asking if distance education satisfies these needs, I have to reply, in parts yes, in parts no, and partly that 'it depends ...'. If we start with the last two demands, there is no conclusive answer. I am afraid that distance education has not taken up the challenge, any more than ordinary education, of providing a complete understanding and perspective. What we positively can say, is that distance education is often used by people who wish to gain a greater breadth in their education. An engineer will study management, a secretary marketing, a social worker reads a little law, etc. In this way, we contribute to a strengthening of cross-disciplinary breadth of knowledge among the participants. An effective system for mature and further education must not only provide updating of skills from basic education. It is equally important to develop breadth and combine skills from various skills areas.

The great advantage that distance education has, lies in the middle of the needs list. Distance education was created exactly for the purpose of opening access to knowledge and education for new groups. It is considerably ahead in being an established system for lifelong training and updating and renewal of work related competence. As a system it is flexible, efficient and reasonably low in demands on resources. An example: Since 1989 between five and six thousand nursery assistants have completed a basic training for their work through NKS, without a single classroom being built, or a new full-time teaching position being created. That would obviously not have been possible with a traditional training organisation.

The two needs at the top of the list bring us back again to our main problem: distance education, technology and society. I would like to look at each of them in turn.

### Adopt available technology and available information resources

In my opinion, education that is to be in step with social development, must use available technology and information resources. This does not mean, at any rate in a negative sense, that it should be controlled by technological development. This negative feeling in the expression is connected to two dangers. The first is that people can be tempted to adopt technology too early, i.e. that technology can be available but not to the actual users of an educational offering. This leads to the possibility that choice of technology does not help to provide good education, but can be a new barrier that prevents users from participating in education. You can easily confirm that by looking at the historical progression. Many technologies have been adopted, but it has often taken a long time from the first adoption before they reached widespread use and were useful in connection with education.

NKS has over the last ten to fifteen years had a systematic, running evaluation and testing of new technological possibilities. In the course of this process we have, amongst other things, made a strategic choice – to invest in visual media, primarily television and video. There are many reasons for that choice, but one of the most important is that these two media are available to all Norwegians – and not only available – people also know for the most part how to work the equipment.

The second strategic choice we have made, is to invest in data communication. This is much more problematic as regards availability. Most people have indeed met and used a computer at work, and many also at home. But it is still a minority that has free access to communication. The most recent figures I know for connections to the Internet, are 21 %, of which 7 % are home users [1]. Even so, this is several hundred thousand people, and the numbers are increasing rapidly. We have chosen data communication as an investment area, because we are convinced that shortly, this form of communication will be normal in most workplaces, and it is gradually appearing to be easy and user friendly.

The second danger which causes technology to be viewed with suspicion, is that we use a technology which is inappropriate to our goal, or we use it in an unsatisfactory manner. There is nothing unusual

in this, and it is not always the fault of the technology. There are times when the technology can be the prime mover, and sometimes the driving force, because it is easier to get money for a technically sophisticated experiment than for one that is less exciting, so to say. Perhaps it is technologists and people who are especially fascinated by technology who both develop and evaluate projects. It is unfortunately harder to pull in sceptics and the less capable, and projects can therefore easily be biased towards technology.

But even the non-technical and pedagogues can make wrong evaluations of what technology is best for. When it is new, indeed there is no-one who can accurately judge, and so there must be a proportion of trial and error before we reach firm conclusions. There is reason for stronger criticism when we sometimes see that we have not learned from our errors, but continue on the wrong tracks. This can be blamed on being in a rut, the financial position or organisational inertia.

One of the best known experts on technology and distance education, Tony Bates at the University of British Columbia in Vancouver, writes that there are two main patterns in today's distance education. Representatives of one stream maintain that the ideal method of education is group teaching in a classroom or lecture theatre, and that the nearer distance education can come to that ideal the better, and so technology should be used that best imitates that ideal. The other tradition is based on development of a teaching tool, preferably in the shape of printed texts and/or television programmes, which can be supplemented with different forms of communication between pupil and teacher. New technology can often be used as a supplement to this basic model [3].

It is not difficult to recognise these two traditions in Norwegian distance education. Tony Bates says – and I believe he is right – that both these methods of using technology are inappropriate and mis-directed. Technological development has reached a point where we should begin to develop new educational models. The problem is not that we are controlled by technology, but that we let our past experience come in the way of good use of the technology that exists.

### Adopt work styles that build up to communication and co-operation

The second demand in connection with development of the information society, is for workstyles that reflect the way in which we have begun to organise ourselves at the workplace. Organisation of projects, building of networks, co-operation and communication are some of the buzzwords. I believe that it is right to say that distance education has not come so far, it is still largely characterised by one-way communication and communication between teacher and the individual student. The picture has been influenced somewhat by extended use of combined education styles, where groupwork and class teaching are regular elements. Even so, I do not feel we have come far enough.

What is of interest, is that changes in the organisation of work processes are closely connected with technological frameworks and tools of different kinds. This also means that the compulsion to be in the same location falls to pieces. The extent of home working increases, and companies and projects are held together independently of geography. This ought to mean that the same technology and tools that enable a workstyle, should be able to be used in a similar way in distance education. In this way, we will have a style of distance education that mirrors real life, and contributes to building up co-operative skills. In this sense, technology can be a bridge-builder between the training system and the workplace.

This thought pattern has been the basis for NKS investing in data communication since 1989, especially in the use of computer conferencing systems. Even so, we have only been partially successful. This autumn, therefore, we are trying something new, in a different style. Firstly, we begin with the Internet, using standard tools. Secondly, we develop a new series, partly in a new style, of course offerings, which are closely connected to central training needs in the workplace, both public and private. We offer subjects such as practical project management, systematic improvement management and strategic competence planning. Thirdly, we try to build in more real-life examples, exercises and projects, that require participants to co-operate on tasks as a part of learning. As far as we are concerned that will be a new

style of distance education, and we will certainly gain much experience in the process that will help us to improve.

### Conclusion

Finally, I want to remind you of the picture of the 'Plough Team' of social and technological development. Distance education should be a plough that opens up for new life and encourages growth in the furrows of development. It is obviously pulled by strong forces. Therefore, it also requires strong hands to steer the plough if it is not to deviate.

### References

- 1 39 prosent av norske husstander har PC. Oslo, *Aftenposten*, 29.10.96.
- 2 Amdam, R P, Bjarnar, O. *NKS : en bedrift i norsk skole*. Oslo, NKS-Forlaget, 1989.
- 3 Bates, A W. *Technology, open learning and distance education*. London, Routledge, 1995.
- 4 Cain, J. Mass media : educational television and radio. In: *The system of distance education. Papers to the 10th ICCE International Conference*. Ljoså, E (ed.). Malmö, ICCE/Hermods, 1975.
- 5 Commission of the European Communities. *White paper on education and training : teaching and learning : towards the learning society*. Brussels, 1995.
- 6 Daniel, J S. Satellites in distance education : Canadian experiments on the Hermes satellite. In: *Correspondence education : dynamic and diversified, vol. 1 : The Advance Papers, 11th World Conference*. Wentworth, R B (ed.). London, ICCE/RRC, 1978.
- 7 DIFF. *Zur Geschichte des Fernstudiums. Eine Ausstellung des Deutschen Instituts für Fernstudien an der Universität Tübingen*. Tübingen 15. Juni bis 11. Juli 1992. Tübingen, DIFF, 1992.
- 8 Feenberg, A. CMC in executive education : the WBSI experience. In: *Proceedings. Nordisk konferanse om fjernundervisning, opplæring og dataformidlet kommunikasjon*. Fjuk,

A Jensen, A E (eds.). Oslo, NKS/  
USIT, 1991.

- 9 Flinck, R. *The telephone as an instructional aid in distance education. A survey of the literature.* Lund, Department of Education, University of Lund, 1975. (Pedagogical reports, 1975, 1.)
- 10 Kristiansen, T (ed.). *A window to the future : the videophone experience in Norway.* Kjeller, Norwegian Telecom Research Department, 1991.
- 11 Kristiansen, T. *Five years of research into the use of telecommunications in distance education.* Kjeller, Norwegian Telecom Research Department, 1993. (TF report R 29/93.)
- 12 Rekkedal, T, Søyby, M. Fjernundervisningsmodeller, datakonferanser og nordiske utviklingstrekk. In: *Proceedings. Nordisk konferanse om fjernundervisning, opplæring og dataformidlet kommunikasjon.* Fjuk, A, Jensen, A E (eds.). Oslo, NKS/USIT, 1991.