



## Viewpoint

# Flash back: Some Reflections on Postwar Distance Education

## A personal view on global developments

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### **Abstract**

The development of distance education reached its final stage as a particular model of teaching and learning when the Corona crisis spread distance educational technologies to the entire global educational sector. Looking back to past development, some unsolved remaining issues are discussed as well as new evolving options.

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## Introduction

The postwar years were accompanied by an extension of educational opportunities in a world with relatively permeable national and international borders. Distance education was one of the means to overcome the earlier restrictions. I want to share some reflections on the dynamic history of an innovative system, which laid the foundations for the digitalization of the current education system and discuss some future tendencies. My first contact with distance education was the German University via Distance Learning ('FernUniversität') in the city of Hagen, German State of North Rhine Westphalia).

The 'FernUniversität' was established 1974 as an autonomous university, following in many ways the model of the Open University in Great Britain, founded in 1969. The aim was to offer a complete academic program – comparable to the courses of conventional universities – without the obligation to attend classroom lectures. I, the author of these memories, joined this university to work in an institute that represented a central unit to support the faculty members in the development of their courses, the *Center for Development of Distance Learning (Zentrum für Fernstudienentwicklung, ZFE)*. I shall use my lifelong experience at the ZFE to illustrate the steady progress throughout the decades. The institute had three sections (Table 1): pedagogical advice, media development/production, and evaluation of teaching materials, all-together system innovation: Didactic advice and ongoing evaluation of the system did not exist in the conventional university.

**Table 1.** ZFE Organizational Chart (Source composed by author)

<p>Counselling and pedagogical support of faculty</p> <ul style="list-style-type: none"> <li>- Economics</li> <li>- Social sciences</li> <li>- Law</li> <li>- Mathematics</li> <li>- Computer Science</li> </ul>	<p>Production</p> <ul style="list-style-type: none"> <li>Print</li> <li>Audio</li> <li>Video</li> <li>Videoconferencing</li> </ul>	<p>Quality assessment of teaching material and of the study system</p>
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The medium to deliver the content was by study modules designed for self-study at home. Students had the opportunity to submit assignments, which were forwarded back to them with corrections. The dates for the submission of assignments and the dispatch of material on certain dates during the year gave a certain rhythm to the study. Pacing is very important to keep students within the system. The study at the FernUniversität, as in other similar institutions, was not completely remote because there were face-to-face tutorials in the regional centers and some face-to-face seminars and exams.

## Stages of development



In the 1980s, other means were introduced to complete the teaching units, such as radio, audiocassette, video and television. Radio broadcasts had the disadvantage of not being storable and requiring a fixed schedule. For this reason, it was thought that an Audio recorded on cassette would be more suitable to provide content closely related to the didactic units. Up to date, the medium has not gained the expected attention and when it later reappeared in a digital format as a "podcast" in general could not attract much interest from most of the teachers. Similar characteristics apply to the differences between educational television and video.

Digitization had its moment in the late eighties with the use of the Personal Computer that served not only for administrative, and calculation matters but also was explored as a new tool to create simulations and animations with formal models. An important step was the digitization of multimedia products on Compact Discs (CD) and later on Digital Video Disc (DVD). The data carrier allowed the integration of different media on a single disk. CD and DVD (Figure 1) paved the way to present complex teaching problems using a wide range of media (1).



**Figure 1.** Multimedia DVD Cover (Source: FernUniversität: 2022)





The complexity of such productions is obvious when we look at characteristics and objectives of the CD-ROM ('Compact Disc Read-Only Memory') legal regulations in urban planning:

- Target Population: Students, Architects, Engineers, Administrators
- Objective: Confront students with the application in real life practice
- Didactic reflections:
  - Construction of the menu according to stages in the planning process
  - Original documents of local procedures in specific cases
  - Selection of a non-traditional lay-out for legal texts
  - Presentation of the text in short chunks
  - Direct links to access the corresponding laws
  - Cartoons related to the context to relax during study hours
  - Exercises to apply the laws and procedures correctly

Unfortunately, the development of such complete projects later showed a certain vulnerability of the content produced when the software service was not updated by the companies that dominate the respective markets; for example, Asymetrix (Toolbook) and Macromedia (Flash).

The 90s can be characterized as an era of web applications. The representation of the university on the Web required a more homogeneous and structured appearance ("look and feel"). Administration and faculties had to streamline their web pages by use of the upcoming content management systems. Thus, web design became a new field of activity for the ZFE at Hagen University. At the beginning, it focused on generating a common platform for the university.

Almost at the same time, in the late nineties, the forms of interaction between and with students changed. Initially, the system disposed of communication by telephone, letters, fax and later also by email. Later, text chat and news groups have been introduced. Interactive audiovisual communication began with the first tests using Integrated Services Digital Network (ISDN) lines for conferencing. Many national and international conferences showed that audiovisual communication across the globe is possible. Today videoconferencing tools form a standard element in learning environments.

At this point, the interest of face-to-face universities in the advances and achievements of distance education grew. Instead of considering the distance teaching university as a "second best" alternative, they had to acknowledge that many of the autonomous distance universities became huge "Mega Universities". This can be seen in the following list, which is only a selection to appreciate the important size of the autonomous distance universities considering their approximate enrolments according to websites.



**Table 2.** Enrolments in selected distance education universities 2021/2022  
(Source: Authors' elaboration based on university websites)

<b>The</b>	National Universities of Distance Education (UNED, Spain)	200.000
	Open University (Great Britain)	170.000
	Fernuniversität Hagen (Germany)	70.000
	Indira Gandhi National Open University (IGNOU, India)	3.000.000
	China Open University (PR China)	3.000.000
	Anadolu Open University (Turkey)	2.000.000
	Athabasca Open University (Canada)	40.000

### Impact of Distance Education

One of the great advantages of Distance education was the modular format of the curricula which gave more options to combine different modules. Another asset was the contribution to applied media technologies. The importance of early innovations in the field of distance education can be appreciated by the fact that electronic word processing began at the Hagen Distance University in the 1970s, i.e., 50 years ago. Online seminars have been experimented with since 1997, 25 years ago. Thus, autonomous universities were pilots in the development of educational technology.

The methodologies and technologies of distance education spread rapidly and today no longer represent a particular feature of university education systems. Today we speak of hybrid or blended learning systems, that is, systems that provide part of the teaching through conventional classrooms and another part through media without the presence of the teacher in the same place. A general term for any combination of face-to-face teaching with elements of network-based learning outside the university is labelled 'Blended Learning'. 'Distance education' puts more emphasis on studying with materials specifically created for self-study but may also include some face-to-face elements. The development of digitalization facilitated communication between teacher and students in a way that allows the student to share a classroom at the headquarters or connect by conferencing tools from their home or workplace (hybrid learning). However, the terminologies are somewhat fuzzy, and each scenario would need a more detailed definition. One of these scenarios has been called "flipped classroom", in which recorded classrooms are distributed through a video to study at home while students have to return to university to solve exercises or tutoring. Although, this scheme could also be applied the opposite way, that is, to attend the classroom lecture live in the university or online and solve tasks at home. Today's features include a wide range of possible compositions.

A "hybrid" scenario already existed, for example, at the Spanish UNED already in 1984, with a common network. Feedback *during* the classroom lectures was possible via chat or email (2). On the other hand, Hybrid brings with it greater coordination problems for both students and teachers as they have to deal with different learning environments.





### *Organizational Changes*

The change caused by web developments also brought about new responsibilities and structural changes. At the FernUniversität, the design of the web pages was considered part of the administration and integrated therefore into the marketing section. In order to maintain a closer contact between the central institute (ZFE) and the faculties, a liaison post was created in each faculty. The conviction was that the chairs would be able to handle the tools of media design by themselves without significant support from didactic experts. It turned out, however, that the organizational change did not increase joint activities of media specialists and faculty while the liaison staff was occupied mainly with administrative tasks. Later on, the ZFE institute was dissolved and integrated with the computer center, which had characteristics more focused on maintaining the correct operation of the system and less motivated to modify and innovate current organizational processes (3).

A similar global trend of internal reorganization was observable at several distance teaching universities probably due to the fact that the development of teaching concepts and products included more and more computer-based components. It seems, however, that some of the reorganization measures have been misled because it is not expected of faculty to invest as much effort in improving their teaching compared to staff exclusively dedicated to this position. In my personal work, my formation training as an economist helped me a lot, both to understand and enrich our understanding of difficult tasks and to add those experiences that were not accessible by the printed modules.

After several years with different arrangements, the Fernuniversität returned to a similar organization like the previous one, today having a "Center for Learning and Innovation" and a "Center for Digitalization and IT". The portfolio of the "Centre for Learning and Innovation" was extended to offer internal training to employees and teachers in the use of digital technologies (digital teaching certificates).

### *Future Students*

In the past, the changes caused by students' activities in social networks showed the relevance of an environment with educational discourses also outside the university. The university must not lose the link with its students but define its own role and consequently also the role of the student in an appropriate way.

Bates (4) mentions in his book 'Teaching in a digital world' the following competencies that will be needed in future years:

- The ability to find, evaluate, and apply knowledge





- Ease of interpersonal communication
- Ability to train continuously
- Creativity
- Problem solving
- Judgement and critical analysis
- Collaborative work.

These points are nothing new, but they indicate the necessary changes.

A research project in Germany investigated which ways research problems can be defined by the student himself and that are not predetermined by the curriculum or faculty. It is to expect that students will have greater autonomy and assume more responsibility to determine their learning needs.

It should be stressed that if the emphasis is more directed towards preparing the student for collaborative work, the present assessment systems must also be modified. The existing system of numerous individual tests is no longer useful for documenting student achievements. E-portfolios show a desired path. Concepts such as the idea of classifying contributions by means of buttons that indicate the role within a student group did not spread to the expected extent, as did peer evaluation. At that time, concepts such as "Do it yourself university" (5) were a stimulating idea but not suitable as a model for the university of the future. More important is to relate and integrate network activities in social groups with university objectives (3).

#### *Costs of technology supported education*

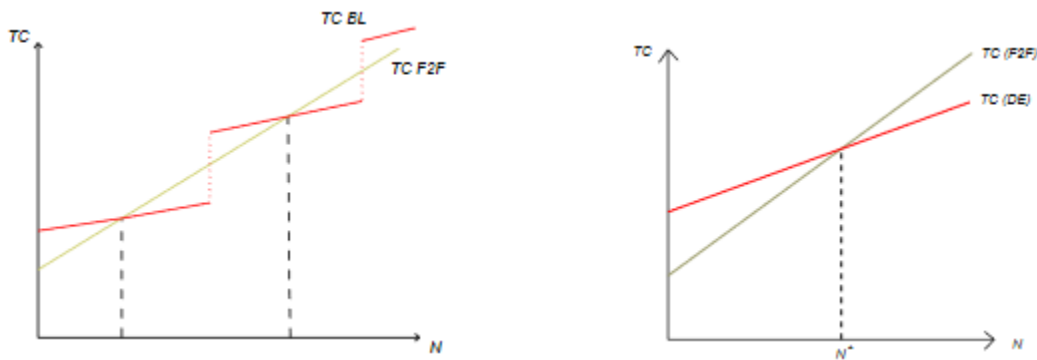
While the distance education model had historically been considered a cheaper system compared to face-to-face university due to the fact that its costs per student falls faster with higher number of enrolments. On the other hand, the hybrid university, with for example 50% face-to-face teaching and 50% distance programs, seems to be somewhat more expensive than the Classical teaching model.

Furthermore, the introduction of digital learning increased the cost of investing in equipment at the student's side, as well as on the teacher's and technical staff's side. The lifetime expectancy of teaching material now depends not only on the necessary updating of academic content but also on the current development of available and compatible technical services and tools.

#### **Figure 2.** Costs of different modalities

(Source: Authors' own creation, 2022)

TC total cost, TC(F2F) cost of face-to-face, TC (DE) distance education,  
TC (BL) combined scenario, N number of enrolments



The first comparative studies of the cost of distance education programs with face-to-face instruction were presented by Wagner in 1972 (6). The result was that from a high number of students, distance education turns out to be cheaper than face-to-face teaching. Even if the size of the fixed cost jumps every time the number of students exceeds a certain level, we no longer receive a single break-even point that equals the average cost per student of both modalities. For a more sensible analysis of hybrid teaching, a separate calculation should be made for each actor (student, teacher, administrator) and each phase of the scenario over time.

Currently we can observe, similar to what happened during the introduction of computers in schools, that governments are concerned with the acquisition of hardware and software to provide virtual classrooms but leave aside the training of actors in the use and maintenance. Training to benefit from virtual teaching is often exhausted in the teaching of software programs without considering how to apply them in specific subjects. Due to this shortage, many teachers during the epidemic distributed homework texts in the form of PDF files, without taking advantage of the other tools available for the design of materials and for online communication. A good help for teachers is web portals that show examples of good practices according to different subjects. It is also important that the examples can be modified by other stakeholders. However, such a website needs quite a bit of administrative capacity to operate and update these applications.

### *Globalization*

A new stage began with the introduction of MOOCs (Massive Open Online Courses) that represent an economic model to extend the focus of a course to a global community with very high numbers of participants. Although the concept of MOOCs was not completely revolutionary, it nevertheless showed the options of serving a global market by sending out teaching material worldwide.

Globalization means greater flexibility of people and resources and includes real and virtual mobility. Students enroll in other countries; professors teach online from other countries. The national education sector opens up. However, this does not mean that the cultural context does not



matter as the saying suggests: ‘The world is flat?’ The antithesis would be that the world is ‘rounded’ with varied cultural contexts.

The cultural context influences all aspects of communication and the design of technical tools. For example, menus in Arabic are located on the right side, in Europe on the left side according to reading direction. Colours have a different meaning, for example, students in China may associate yellow as an erotic signal, while in Europe the same goes for the color red.

We can observe, for example, that many large companies offer training to their managers in cultural aspects as well. However, there are opinions that understanding the correct language (English) and the automatic translation of texts are sufficient for the direct transfer of knowledge (7). However, though access to educational content at the international level has been opened up, it is still limited by its different cultural contexts and different national regulations. Nor does today's globalization coincide with the slogan ‘Let a thousand flowers blossom’ which pretends equal possibilities for all those who wish to offer a course at a global level. Large companies like Coursera can offer their courses at a very low cost and become big global players in an oligopolistic educational market.

Universities for the elites will most likely be left with more emphasis on face-to-face teaching with low enrolments, while the masses will frequent institutions focused on offline learning at home. However, the Covid-19 crisis showed that learning from home is less attractive to students due to a lack of social contacts.

### *Learning Analytics and Artificial Intelligence*

The options of collecting and processing large amounts of data from the learning process and the possibility of making individualized recommendations to support decisions of university actors have been considered as promising concepts for the university of the future.

Looking back, until today there has not been much impact on the practice of teaching. For example, virtual tutoring, an application of artificial intelligence due to the fact that the teaching/learning process is extremely complex, did not offer simple and applicable solutions in daily teaching (Han, 2015; Oliveira et al., 2012).

In recent years, there has been reflection on whether methods outlined in this paper, generate a profile that follows the objectives of the institution rather than the preferences of those who are evaluated or advised. Other critical issues refer to the reliability of information and the sources data are collected. Nevertheless ‘Learning Analytics’ and ‘Artificial Intelligence’ will change our environment and currently are subject of many investigations We will have automatic personal learning assistants to organize the personal agenda, make recommendations about the curriculum, follow up careers, propose an individualized curriculum, and other applications. Mainly, the



applications that are most apt to benefit from artificial intelligence are repetitive routines and those that do not change quickly.

The lack of trained teachers is not reduced by artificial intelligence. The shortage of teachers rather is aggravated by the time needed to train the use of hardware and software. One can easily get lost in the jungle of data. More important is the integration of learning within the university with practice outside the university ('Praxiserfahrungen').

In addition, the accumulation of data in the hands of large companies or totalitarian governments makes hidden control possible and the introduction of access restrictions. Data becomes marketable products. In this context, we speak of 'digital capitalism' Saura, E. et al. (2022). Today we are witnessing a new confrontation of the East and West systems. Putin, for example, proposes for Russia a return to previous values and cultures. We see that artificial intelligence can be used for political purposes and for the manipulation of society.

### **Conclusions**

Distance education has changed the role of the teacher as the role of the student. Each stage of technological development was quickly implemented into the teaching/learning system of distance education. The reflection of the problems and advances of distance education are important to understand the future aera with integration of applications based on artificial intelligence.

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