

EVALUATING DIGITAL DISTANCE LEARNING (DDL)

Studies, practices and recommendations for evaluating Distance Learning Activities and Programs

Martin M. Valcke

**Educational Research and Expertise Center,
Netherlands Open University**

&

Frans L. Leeuw

**Department of Humanities & Social Sciences,
Netherlands Open University & University of Utrecht,
Department of Sociology, Netherlands.**

with the collaboration of Albert Kamperman, Department of Humanities & Social Sciences, Netherlands Open University¹.

This project was sponsored by the World Bank/Economic Development Institute. We thank Ray C.Rist , John Ox, Anna Stahmer and Mark...[///] for comments on an earlier version.

©1998

¹ Albert Kamperman is responsible for the section on Computer Mediated Communication.

About the Open University of the Netherlands

The Open University of the Netherlands is an independent government-funded institution for open higher distance education, established by law in 1985. Today, about 22,000 students are involved in courses and/or programmes in the field of law, economics, business and public administration, engineering, environmental science, cultural studies or social sciences/psychology.

The Open University charter identifies two main aims:

1. to create a more cost-effective form of higher education,
2. to encourage innovation in higher education, in terms of both the curriculum and the teaching methods.

In relation to the latter structural collaboration with higher education institutes has been established and Open University products are developed in view of the needs and demands of education partners. At the content level innovative R&D and educational activities focus especially upon the integrated use of advanced information and communication technologies.

More information about the Open University of the Netherlands can be obtained from: www.ou.nl

Executive summary

The goal of this report is to present a state-of-the-art on evaluations of distance education and learning activities and in particular digitized activities. The focus is primarily on developing countries. Some 120 recent evaluations have been brought together in which the use of information and communication technologies (ICT) often plays a role. This we call Digital Distance Learning (DDL) or Digital Distance Education (DDE). The DDE/DDL-examples represent mainly experiences with credit-courses. We hardly have encountered evaluation studies involving (digital) non-credit courses, short seminars and workshops that were focused at developing countries.

The overall picture indicates that a vast body of experiences, expertise and examples is available in the field of evaluations, which make it possible to put forward recommendations. But there are also a number of important shortcomings and blind spots. This brings the authors to the conclusion that without the construction of an *evaluation infrastructure*, DDE/DDL (in developing countries) will continue to suffer not only from inadequate evaluation approaches and designs but also from relevant findings.

The report starts with a description of the field of DDE/DDL. We elaborated a frame of reference that helped to screen the literature. This frame of reference represents five dimensions. Review, analysis, conclusions and recommendations are presented following these dimensions.

The first dimension focuses on internal evaluation studies based on the *analysis of performance*. Performance indicators assessing distance education are developed and available. It is important to note that performance indicators can be culturally 'incorrect' and that most performance indicators do not specifically focus on digitized DE. We *recommend* to develop specific performance indicators when ICT is a central characteristic and to assess what in practice has been done with information resulting from performance indicators.

The second dimension focuses on internal studies that *monitor student/client attitudes and perceptions as well as staff (quality)*. There is abundant research on perceptions, opinions and cognitions of students/clients regarding (D)DE. It appears that when digitization is not part of a more integral, holistic approach to Distance Education, the attitudes are not very positive. We *recommend* that DDE/DDL-initiatives should monitor the knowledge students /clients have about particular provisions and monitor the level of integration of the different delivery media used. At the same time the relative importance students / clients attach to different delivery media should be checked.

As to the quality of the staff, both qualitative and quantitative evaluation studies are found. Also the ways in which staff is trained are evaluated. Following the results, we recommend to follow a multitude of paths to develop the skills required in staff development and to focus both upon projects at the short and long term.

A *third dimension* presents external evaluation studies that focus on the *socio-cultural environment, cost-benefit studies, feasibility studies and networks and network analysis*. As to the socio-cultural environment, both the local as the national level should be taken into account when doing evaluations. This is also true for the embeddedness of distance learning initiatives into the workplace, regional centers and community centers. We recommend to check:

- whether the environment of a DDE/DDL-project offers opportunities to share resources;
- to look for partners that help to strengthen DDE/DDL-initiatives;
- to analyze what communication channels and approaches are available to spread interest in digitized initiatives;
- to set up research to define “appropriate technologies” for developing countries; and to check whether capacity building is also necessary in the environment of the project.

With regard to *cost-benefit analysis (CBA)*, our assumption that relatively large numbers of CBA with a focus on DDE/DDL were available, did not come true. There even appears to be a certain reluctance in carrying out this type of evaluations. However, CBA’s that have looked into Digitized DE are in general positive about this approach. Recommendations with regard to *cost-benefit analysis* ask to define non-financial costs and benefits to be incorporated in the analysis, next to value driven benefits and societal or value-added benefits (e.g. reduce pollution). A second recommendation asks to have an answer ready to the question to what extent the variables in a cost-benefit analysis are derived from the specific DDE/DDL-setting in a developing country? Next, the question arises whether the analysis is based on data from a sufficiently long period? A fourth recommendation focuses on the perspective of different stake holders when calculating costs and benefits.

With regard to *feasibility evaluations*, we found some examples making use of a multi-method approach.

As to networks and *network studies*, we found that partnerships are important for developing DDE/DDL; in several evaluations they were investigated. It also turned out that importing digitized distance education-models from developed countries into developing countries is critically received.

The *fourth dimension* concerns the *stakeholder approach*. With regard to data-collection it is important to pay attention to the possibility that stakeholders hold opinions, attitudes and cognitions about ICT while they themselves did not have *hands-on-experience*. Although Hypothetical Question Methodology is useful in interviewing stakeholders, this artefact must be looked after.

Recommendations include suggestions to identify the stakeholders at a variety of levels (target audience, institution, institutional network, national and international) and along a variety of dimensions (educational, economic, societal/cultural). It also seems wise to identify the congruencies and/or conflicts in the interests of the stakeholders and discuss them beforehand. We also recommended to check the level of flexibility in the project to deal with the differing interests of stake holders/partners.

The *fifth dimension* is not exactly a 'dimension' but more of a group of interesting topics that are being evaluated in the context of distance education. *media selection and media usage* in (D)DE; *Total Quality Management* and *ISO-certification*; and *studies focusing on Computer Mediated Communication (CMC)*.

The analysis indicates the importance of media selection when doing distance education and evaluations. The analysis also reveals that Total Quality Management of (D)DE indeed is possible: there are cases in which an overall Quality Management / Control program has been evaluated; the same is true for ISO-certification. But it is recommended to check the validity and reliability of data used in a TQM process. As to studies focusing on CMC, they show that a straightforward transfer of knowledge about face-to-face communication to computer mediated communication settings is not possible. Nevertheless, several studies show that CMC can be an effective way of knowledge transfer.

The report ends with bringing together 'blind spots', 'forgotten variables' and 'promising directions', when evaluating (digital) distance education. Some of them are:

- Hardly any attention is paid to the underlying '*program logic*' of distance education activities and digitized ones in particular, while the same can be said about (underlying) *pedagogical transfer mechanisms* and *scenarios*. McNeil (1998) who summarized attitudes of leading educators regarding the Internet as a tool of (distance) education mentioned both positive aspects as well as negative ones. Given these differences in values attached to Internet, articulating and evaluating social, cognitive and behavioral assumptions underlying the Internet as an education tool, is strongly recommended.
- Information on the *impact* (D)DE evaluations have had on decision-makers, teachers and trainers is hard to find. *Utilization of evaluation findings* is not often addressed.
- Though ICT opens up new ways for *data-collection*, we did not come across many studies making use of these possibilities.
- Acknowledging the importance attached to *networking and 'partnering'*, the attention paid to these variables still is limited. In the evaluations we referred to, a *traditional* approach to networks is used which focuses on institutional collaboration. We did not run into studies in which networks were empirically charted (over time), nor did we find studies which answer the question how networks can be 'managed'.
- There are only a few evaluations of *short term teaching and training programs*; most of the evaluations looked into programs with a focus on credits and (academic) degrees. Given the focus of the World Bank /EDI on primarily these types of DDE/DDL, this also is an important blind spot.

However, we believe that the following activities are *promising*.

- Performance monitoring using the extra facilities that are offered by digital developments to data-collection & analysis.
- Enhancing knowledge about the impacts of computer-mediated communication (CMC). The potential of CMC opens new ways to involve a large and varying number of stakeholders in the evaluation process. Next to building upon the information one might obtain through direct interaction, there are extra possibilities, such as background monitoring and logging of data-usage and interaction patterns. CMC-systems can document who got in touch with who, what kind of data were consulted by whom, what kind of data are never consulted, at what time is interaction high and/or low, which individuals/groups are always involved in the

activities (creaming) or hardly ever (social marginalization), to what extent is the performance of the infrastructure optimal (peak usage, system failures) etc.

- The development of a 'systems level type of evaluation'.

Content

1. INTRODUCTION, QUESTIONS ASKED AND APPROACH FOLLOWED	9
1.1 INTRODUCTION.....	9
1.2 QUESTIONS ASKED	11
1.3 APPROACH ADOPTED.....	11
2. WHAT IS “DIGITAL” DISTANCE LEARNING (DDL)?.....	14
3. A FRAME OF REFERENCE FOR EVALUATING (DIGITAL) DISTANCE EDUCATION: APPROACHES AND METHODOLOGY USED IN THE (RESEARCH) LITERATURE	18
3.1 INTERNAL EVALUATION STUDIES BASED ON THE ANALYSIS OF PERFORMANCE DATA	20
3.1.1 <i>Methodological considerations</i>	20
3.1.2 <i>Performance indicators</i>	21
3.1.3 <i>Findings on performance</i>	22
3.1.4 <i>Conclusions</i>	24
3.1.5 <i>Recommendations</i>	24
3.1.6 <i>Monitoring attitudes and perceptions</i>	25
3.1.7 <i>Monitoring staff (quality)</i>	26
3.1.8 <i>Conclusions</i>	27
3.1.9 <i>Recommendations</i>	28
3.2 EXTERNAL EVALUATION STUDIES	29
3.2.1 <i>The socio-cultural environment</i>	29
3.2.2 <i>Cost-benefit analysis</i>	31
3.2.3 <i>Feasibility studies</i>	34
3.2.4 <i>Networks and networks analysis</i>	35
3.2.5 <i>Conclusions</i>	38
3.2.6 <i>Recommendations</i>	39
3.3 EVALUATION STUDIES IN WHICH A STAKEHOLDER APPROACH IS USED	41
3.3.1 <i>Conclusions</i>	43
3.3.2 <i>Recommendations</i>	43
3.4 OTHER APPROACHES AND METHODS.....	44
3.4.1 <i>Evaluating media selection and media usage</i>	44
3.4.2 <i>Total quality management and iso-certification</i>	45
3.4.3 <i>Computer mediated communication (CMC) and virtual teams: some psychological studies</i>	47
3.4.4 <i>Conclusions</i>	51
3.4.5 <i>Recommendations</i>	51
4. BLIND SPOTS, FORGOTTEN VARIABLES, THE IMPORTANCE OF AN EVALUATION INFRASTRUCTURE AND PROMISING DIRECTIONS	52
4.1 BLIND SPOTS & FORGOTTEN VARIABLES	52
4.2 EVALUATION INFRASTRUCTURE/EVALUATION CAPACITY BUILDING.....	53
4.3 PROMISING DIRECTIONS	55
5. PUTTING THINGS TOGETHER: FINAL CONCLUSIONS	57
6. REFERENCES.....	62
7. APPENDIX 1: CALCULATION MODEL.....	73
8. APPENDIX 2: TECHNOLOGY DECISION INSTRUMENT	74
9. APPENDIX 3: CENTERS OF EXCELLENCE.....	75
9.1 UNIVERSITY OF BRITISH COLUMBIA - CENTRE FOR DISTANCE EDUCATION, & TECHNOLOGY CONTINUING STUDIES	75
9.2 CENTRE FOR RESEARCH AND DEVELOPMENT IN TEACHER EDUCATION, SCHOOL OF EDUCATION, THE OPEN UNIVERSITY, UK	75

9.3 TECHNIKON - SOUTH AFRICA.....	77
9.4 THE COMMONWEALTH OF LEARNING - COL.....	79
9.5 LAURENTIAN UNIVERSITY, INTERNATIONAL PROGRAMS AND PROJECTS.....	79
10. LIST OF TABLES.....	80
11. LIST OF FIGURES.....	80
12. LIST OF ABBREVIATIONS.....	81
13. LIST OF EXPERTS CONTACTED.....	82

1. Introduction, questions asked and approach followed

1.1 Introduction

For the World Bank and EDI in particular, distance education focuses on courses for development of professionals, often without (official) credits or degrees. Policy seminars need to be mentioned too. As it is one of EDI's goals to 'deliver usable knowledge to those who need it when they can best put it to use' (Thomas, 1996:9), the focus is on the 'power of learning'. Given the geographical distances that have to be bridged by the World Bank/EDI, the question is relevant how *distance education and training*, and in particular *digitization*, can be evaluated.

We can illustrate the importance of (digital) distance education for the World Bank in two ways. The first concerns the *WORLD BANK LEARNING NETWORK [WBLN]*, the second concerns several types of (face-to-face) *workshops and seminars facilitated by EDI*.

Recently the *World Bank Learning Network [WBLN]* (www-site) has been launched, which pays attention to digital and other forms of distance education. "In order to fulfill its role as a Knowledge Bank, the Bank has established a Distance Learning Unit, housed within the Economic Development Institute (EDI). The mandate of EDIDL is to help the World Bank expand the reach and impact of its knowledge through training and learning services using distance learning approaches and technologies. EDIDL will function as the focal point for Bank efforts to use Information Communications Technologies (ICTs) to help meet client learning needs. Distance learning will encourage the broadest possible access to EDI services and will include print, videoconferencing, interactive television, Internet and other electronic formats. In addition to its ability to leverage the knowledge available within the Bank, EDIDL will act as a broker on behalf of clients, offering them access to knowledge sources and resources from other organizations and networks.

EDIDL focus is two-fold. Firstly, it works with Task Managers to develop core and other courses for distance learning. This initiative will also include Point/Multipoint events and special events. Secondly, it will provide an infrastructure that will allow clients to access distance learning services and technologies throughout the World Bank Network".

It is also stressed that "EDIDL believes that effective distance learning depends on an integrated mix of technologies and media and, in particular, providing learners with appropriate support services".

In its activities on distance education, the Bank stresses the importance of *underlying pedagogical scenario's* and their evaluation. "WBLN supports an integrated, multiple media approach which can be described as instructor-directed and learner-centered. One of the key elements in the successful delivery of core courses by distance learning will be the support provided to course participants through the Learning Centers. Core courses will use synchronous delivery methods, videoconferencing and interactive television, as well as asynchronous media and methods such as print, Internet/WWW and CD-ROM. LearningSpace is the software package that will allow course developers and deliverers to more efficiently integrate both synchronous and asynchronous learning activities. All of these approaches are designed to foster an

interactive process between subject matter experts, instructors and participating learners, the learner and the learning materials and among the participating learners themselves.

These delivery mechanisms and methods will be integrated based on what are called Pedagogical Scenarios. Pedagogical scenarios are developed and modified in response to the course subject matter, the needs and requirements of the learner, the relative emphasis of synchronous versus asynchronous interactivity and the capabilities and capacities available at Learning Center sites”.

The over 400 courses that EDI/World Bank possesses together form a large ‘knowledge base’ for distance education. However, distance education and training is much more than mailing or taping course-ware. The Bank stresses that an instructional or pedagogical model is needed to realize an efficient and effective transfer, while using state of the art ICT (information and communication technology).

The World Bank underlines that evaluation is a central aspect of the (digitized) learning network. Within the realm of such an evaluation, topics to be studied are:

- participant reaction to the usefulness and effectiveness of distance delivery modes for learning;
- the reactions of the participants to the course subject matter and process, e.g., topics selected, breadth and depth of treatment, usefulness of learning activities;
- the appropriateness of the course materials developed;
- the extent to which new skills and competencies have been acquired by participants;
- other client's, partner's and stakeholder's reactions and observations of the effectiveness of distance learning delivery;
- cost effectiveness of distance learning versus conventional approaches.

Secondly, EDI-facilitated seminars for policymakers, practitioners and others also show the growing importance of distance education and learning. This can be illustrated by referring to EDI’s report “*Learning together with partners: private sector development training and consulting in economies in transition*”. In this study the author (Petkoski, 1998) describes more than 100 training activities, ranging from training of training programs to self-standing seminars for policymakers, parliamentarians, opinionmakers and practitioners. The subject matter of these courses concerned privatization and post-privatization restructuring, development and implementation. A similar development concerns the workshops, facilitated by EDI that focus on *curbing corruption*. In EDI’s anticorruption program that is established in over 15 countries, *workshops, knowledge transfer, development of competences* (for example: to learn journalists to carry out investigations and how to help establish a free press) and *collaborative learning* (judiciary, civil society, parliament, public sector) are important. In the two countries where recently a mid-term evaluation of the anticorruption program has taken place (Uganda and Tanzania), between 30 and 40 workshops over the last 4 years were

organized (Leeuw & Van Gils, 1998). Knowledge transfer, attitude formation and development of competences² were on the agendas during these sessions. If, due to geographic or other reasons, EDI might decide to have distance education and training play a more prominent role here, then knowledge about how to evaluate such an approach is relevant.

1.2 Questions asked

Summarizing: *distance learning and training* in terms of knowledge transfer, collaborative learning and developing competences through state of the art ICT, is the subject matter we will look into. We will do so from the *perspective of recent evaluations*. Although the focus clearly is on *developing countries*, due to lack of data we will also use findings from other parts of the world (Eastern Europe for example).

We will answer the following questions:

- which types of evaluations have recently been carried out, how can they be categorized and what are some of the major results? (Section 3);
- are there 'blind spots' and 'forgotten variables' when evaluating (digitized) distance education? (Section 4.1);
- how important is an evaluation infrastructure ('evaluation capability') if (digitized) distance education is to be developed, implemented and improved and what are the central characteristics of such an infrastructure? (section 4.2);
- which recommendations can be derived when summarizing our study concerning evaluating (D)DE (section 5)?

1.3 Approach adopted

Given the objectives put forward, the following activities were carried out:

- Elaboration of a frame of reference to describe the broad range of evaluation approaches that are relevant for (D)DE and categorize them;
- analysis of available data and new data obtained from recent project reports, publications, conference proceedings in the field of Distance Education (\pm 2000 documents). Priority was given to the analysis of recent information;
- consultation of experts in the field to trace exemplary projects/initiatives (\pm 50 persons contacted) and centers of excellence (see section 9 & 13) and
- documenting the frame of reference with as actual/recent examples as possible.

1.4 Restrictions under which this study was carried out

First, the evaluation studies referred to in this report not always focus primarily on *digitized* distance education. In many cases the perspective is primarily on *other* forms of distance education and training, sometimes only including innovations in the

² Interesting is a recent EDI manual: 'Evaluating the impact of training and institutional development programs; a collaborative approach', Washington DC, 1998 that Suzanne Taschereau authored.

field of digitization. The reason is simple: digital distance education is still in its infancy.

Secondly, we stress that the larger part of this report is based upon evaluations of forms and types of (digitized) distance education that deal with education and training leading to *credited courses and degrees*. The reason is that the number of evaluations in the field of distance training and education related to *short-term courses and training, to policy seminars and to experts' workshops*, in general is limited and with regard to developing countries extremely limited. However, as more and more attention is paid to collaborative learning, development of competencies, transfer of practitioner's knowledge and ICT, *both in distance education programs focused on credits and degrees as well as in short term (non-degree) training*, we are confident that our overview is relevant for the World Bank and EDI/LLC in particular. To stress this point, the next section summarizes what we found when searching for evaluations of non-credited courses in Europe and the USA.

In *Europe* the *Association of European Correspondence Schools* (AECS) represents 65 private institutes/companies that are involved in non-degree courses³. Analysis of information obtained from AECS (<http://www.xmlink.nl/aecs/index.htm>) does not reveal an explicit policy and/or approach focused on evaluation. Interesting is that AECS has developed a quality guide to safeguard the standards and maintain quality to ensure the credibility of non-credit distance education.

In the *USA* the *American Association for Training and Development* we refer to. In a recent study the following topics are discussed⁴. First it was shown that “industries that deliver training via the Internet or intranets doubled their activity between 1996 and the first quarter of 1997”. Several examples were given, like CBT Systems that markets to large companies training courses delivered over their intranets, Logical Operations Interactive and Microsoft Online Learning Institute. The report also states that “although the use of the Internet and intranets to deliver training is not yet widespread, it's expected to jump dramatically in the next three years. Eighty-one percent of the companies that are members of ASTD's (American Society for Training and Development-www site) Benchmarking Forum anticipate an increase in using the Internet for internal training”. The ASTD study goes on to say that “ a critical question concerning learning technologies is their *cost-effectiveness* compared with traditional training approaches. Unfortunately, there's little solid research comparing the cost-effectiveness of traditional versus electronic approaches. Nevertheless, here is some evidence that electronic learning technologies can be highly cost-effective.

- A consortium [Government Alliance for Training and Education] reports that training time and costs have been reduced significantly by distance learning at the U.S. Department of Energy and Federal Aviation Administration;
- The U.S. Coast Guard has used multimedia for several training initiatives, resulting in significant annual savings due to less need for instructors⁵;
- At the AT&T Center for Excellence in Distance Learning, videoconferencing and other distance learning resulted in significant cost savings⁶;
- A 1992 study by Pennsylvania State University⁷ suggests that employee retention during training via distance learning is equal or superior to classroom instruction. Another study shows that interactive video-based instruction achieved a 25 to 50 percent higher retention rate than classroom instruction. More evidence shows that the quality of learning is higher with either interactive CBT training or other self-directed, computer-based training than traditional instruction;
- The speedy rate of training delivery is a clear advantage of most electronic learning technologies. Case studies show that self-paced, multimedia training can take 20 to 80 percent less time than instructor-led training, due to a tighter instructional design and learners' option to bypass content already mastered⁸. A survey of more than 100

³ Nearly all members of the European Community are represented in the Association of European Correspondence Schools (AECS). But the AECS has also members in Iceland, Norway, Russia, Switzerland and Turkey. With 4,000 different courses the members of the AECS work with more than one million students all over Europe.

⁴ THE WEB TEAM (Laurie J. Bassi, Scott Cheney, and Mark Van Buren), Training Industry Trends 1997, in: F E A T U R E, N O V E M B E R 1 9 9 7 (<http://www.astd.org/>).

⁵ (Training, February 1997).

⁶ ("It's Time To Change the Way We Train!" by A. Chute, H. Starin, and D. Thompson, 1996, <http://www.lucent.com/cedl/dlnews1t.html>).

⁷ (Multimedia and Videodisc Monitor, March 1992).

⁸ (Training & Development, February 1996)

companies shows that multimedia training can reduce learning time by 50 percent, compared with classroom training.

- Companies such as Apple Computer, Andersen Worldwide, and Storage Technology report less training time with multimedia. Storage Technology technicians who were once required to travel to a central location for four to 10 days of training now receive training through a localized multimedia system, saving \$1.5 million over a three-year period⁹;
- Some studies suggest no significant difference between new and traditional training approaches in terms of learning and employee satisfaction (<http://www.usdla.org/dl.html>, 1997).

2. What is “Digital” Distance learning (DDL)?

The field of distance education is moving from a second generation approach towards a third generation approach that heavily relies on the use of information and communication technologies (ICT). These new media incorporate the use of TV, satellite, radio, internet, CD-ROM, CD-I, CD-V, DVD etc. In the context of this state of the art- report we call this new approach *Digital Distance Learning (DDL)* or *Digital Distance Education (DDE/DDL)*.

The earlier second generation¹⁰ approach reflected an industrial design, production and exploitation model that heavily relied on ready-made comprehensive (mainly print-based) packages. This second generation approach is still a pre-dominant model in many distance education institutions and projects. It represents a supply-driven mode of education, in clear contrast with the current trend to present *demand-driven education* (Valcke & Kirschner, 1995).

⁹ (Journal of Interactive Instruction Development, Winter 1996).

¹⁰ The second generation approach builds upon the experiences from the first generation model, that also has been called the correspondence model of education.

DDE/DDL is presented as a revolutionizing solution to distribute learning opportunities, to enlarge access to education, to deliver more effective/efficient education and to realize demand-driven education. But as will be analyzed in the context of this report, evaluations also show that the “revolutionizing” impact of DDE/DDL is not always that clear and/or depends on different conditions in the actual DDE/DDL-setting or its context.

The *third generation approach* towards Distance Education builds strongly upon the potential of information and communication technologies (ICT). ICT is expected to facilitate and support basic characteristics of a specific educational approach underpinning this DDE/DDL-model. **Fout! Onbekende schakeloptie-instructie.** shows how these characteristics are related to the second generation of distance education. These characteristics explain why the third generation is interested in realizing “contact at a distance”.

Table Fout! Onbekende schakeloptie-instructie.: Comparison of second and third generation distance education approaches

Second generation	Third generation
pre-dominance of individual learning approaches	collaborative learning activities high emphasis on interaction and communication
print-based materials	multi-media based materials
all materials equal for all students	adaptation of materials to student needs and/or characteristics (flexibility)
high investment in a priori design and development of learning materials	higher investment in the exploitation phase

The variety of ICT-components in a DDE/DDL-environment is wide. Considering the state of the art and the rapid changes in the available technologies, DDE/DDL can be based on combinations of the following ‘technologies’ (cf. comparable overviews of Bates, 1995 & Fulzele, 1997):

- face-to-face human contact
- printed text (with graphics)
- audio cassettes
- video cassettes
- telephone support and teaching
- computer-based learning (computer assisted learning, computer-managed learning)
- cable TV
- satellite TV
- computer-based audio-graphics (combining telephone conference and computer data exchange to exchange e.g., texts, tasks, graphics, etc.)
- view-data
- tele-text
- video-discs
- computer controlled interactive video

- video conferencing

- electronics mail
- computer conferencing
- Internet
- computer-based multi-media
- remote interactive data-bases
- virtual reality

In most DDE/DDL-initiatives a mixture of technologies is used. Mixing technologies is in line with the different educational/didactic functions the technologies help to support. Bates (1995) gives a projection of such a possible relationship between media, technology and distance education applications of the technology in **Fout! Onbekende schakeloptie-instructie..**

*Table **Fout! Onbekende schakeloptie-instructie.**: Interrelation between media and educational potential*

media	technologies	distance education applications
text	<ul style="list-style-type: none"> • print • computers 	<ul style="list-style-type: none"> • course units; supplementary materials; correspondence tutoring • databases; electronic publishing
audio	<ul style="list-style-type: none"> • cassettes; radio • telephone 	<ul style="list-style-type: none"> • programs • telephone tutoring; audio-conferencing
television	<ul style="list-style-type: none"> • broadcasting; video cassettes; video discs; cable; satellite; fiber-optics; microwave; video conferencing 	<ul style="list-style-type: none"> • programs; lectures; video-conferences
computing	<ul style="list-style-type: none"> • computers; telephone; satellite; fiber -optics; ISDN; CD-ROM; CD-I; CD-V 	<ul style="list-style-type: none"> • computer-aided learning; e-mail; computer conferences; audio-graphics; databases; multimedia

Nevertheless the wide variety of technologies that have a potential to be used in distance education, some of them are more commonly used than others. Bates (1995) indicates that in distance education the five most important media still are (in order of importance):

- direct human contact (face-to-face),
- text (including still graphics),
- audio,
- television and
- computing.

The former overview indicates that the 'level of interaction' of specific technologies defines their educational potential in the DDE/DDL-setting. **Fout! Onbekende schakeloptie-instructie.** shows how the two-way interactivity allows the realization of the very specific characteristics of the third generation of distance education

(based on Bates, 1995).

Table Four! Onbekende schakeloptie-instructie.: One-way and two-way technology applications in distance education

media	one-way technology applications	two-way technology applications
text	course units; supplementary materials	correspondence tutoring
audio	cassette programs; radio programs	telephone tutoring; audio conferencing
television	broadcast programs; cassette programs	interactive TV (TV out and telephone in); video conferencing
computing	computer assisted learning; computer-managed learning; computer-based training; databases; multimedia	e-mail; interactive databases; computer-conferencing

Particular attention must be drawn to the *Internet* as an emerging 'digital' tool for distance education. Mason (1998): "What is so remarkable about the Web, and undoubtedly accounting for its popularity with such a diversity of users, is its capacity to bring together a range of otherwise disparate technologies, opportunities for designing courses, and competing providers of resources for learning. Its versatility can be summed up in the notion that anyone can publish and broadcast on the Web and thus reach large numbers of intended and unintended receivers. Users can choose to access learning materials, to communicate with fellow learners or to prepare their own personal pages. It supports real time personal interaction with its high tele-presence through visual and auditory connection, yet it also provides outstanding facilities for asynchronous resource sharing and communication." In *EDI-s Forum* (1998, 9-12) McNeil (1998) cited leading educators [who] gave their views of the Internet and its usefulness as an educational goal. They did so during the Second International Conference on the Internet and Society, hosted by Harvard University (May 1998). "Almost all predicted the Internet would change the teaching profession in some way. Many discussed the value of virtual classrooms for older, part-time students and the flexibility the Internet provided them. Others cautioned against the 'butterfly defect', caused by the Internet, through which students bombarded by a mass of disjointed information are unable to construct it in a usable way' (McNeil, 1998: 10).

Further in this report we will look more in depth into Internet as a tool of DE.

However, considering the high potential of the Internet, there appear to be a number of issues that inhibit the direct use of the Internet in DE-settings in developing countries. This is not only related to availability of technology, but even to a larger extent to the necessity to guarantee cultural embeddedness of the DDE/DDL-approach in the national, regional or local setting. We will come to that point later.

3. A frame of reference for evaluating (digital) distance education: approaches and methodology used in the (research) literature

According to Thorpe (1988) “evaluation is the collection, analysis and interpretation of information about any aspect of a program of education and training, as part of a recognized process of judging its effectiveness, its efficiency and any other outcomes it may have.”

This approach to the concept of evaluation implies that monitoring activities, total quality management approaches (TQM), and defining and using performance indicators are considered examples or cases of evaluation.

As the literature in this field is abundant (Calder, 1994; Flagg, 1990; Thorpe, 1988, Mason, 1992 & 1995; Kess & Pyykönen, 1998; Kemmis, 1980; Lee, 1994), we decided to focus on the following *types of evaluations*:

Table Fout! Onbekende schakeloptie-instructie. Overview of evaluation dimensions

Evaluation dimension	section in this report	number of studies
evaluation studies carried out internally in which the analysis of performance data is central	section 3.1	13
evaluation studies, carried out internally in which attitudes and perceptions of students/clients are monitored as well as staff (quality)	section 3.2.	11
evaluation studies carried out externally with a focus on the socio-cultural environment, visibility, feasibility, cost-effectiveness and networking	section 3.3	25
evaluation studies in which a stake-holder approach is used	section 3.4	5
other approaches/methods	section 3.5	26

The third column shows the *number of studies* we have traced to document this report.¹¹

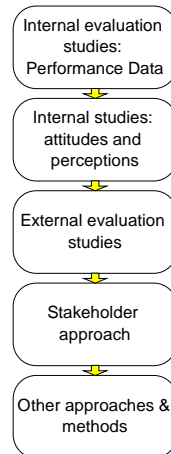
The *first* rationale underlying this selection is that all the studies we refer to have to be *empirical*. We excluded studies in which reflections were central. Neither did we include studies that focus on sorting out the ‘future of distant education and training’ without a solid empirical basis.

Secondly, we thought it wise to look for and use internal as well as external evaluations. Internal evaluations are carried out by or under the supervision of the distance education institute/organization itself, external evaluations are carried out by outside experts. We refer to Sonnichsen (1994) for more information on the importance of this differentiation.

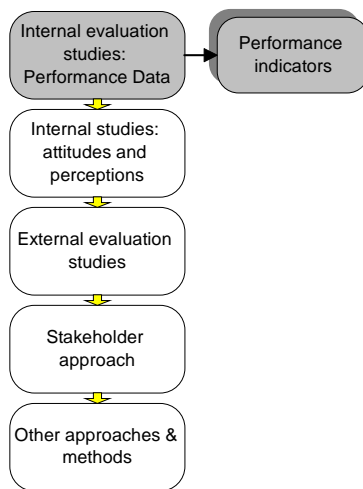
¹¹ Studies that are referred to in section 9 when presenting and discussing five centers of excellence can be added.

Thirdly, we refrained from trying to categorize the studies we found under traditional headings like the types of designs used (sample survey, case study or different types of experiments) or the formative versus summative approach (GAO, 1991; Rossi & Freeman, 1993). Sometimes several designs were used simultaneously which makes categorization difficult. However, we also believe that our structuration is somewhat more in line with what distance educators are used to.

To orient the reader when reviewing the evaluation reports, we will (again and again) present a *graphical representation* depicting these five dimensions adopted to structure this report. We will indicate in *gray* what specific dimension is discussed.



3.1 Internal evaluation studies based on the analysis of performance data



3.1.1 Methodological considerations

There is a tradition in distance education to carry out surveys to gather client and student data for further analysis. In DDE/DDL comparable techniques are being adopted. With the availability of information and communication technologies, new possibilities arise. Schultz et al (1997) have criticized the traditional survey approaches and have presented a set of more innovative approaches in line with the potential of the information and communication technologies. Next to a strengths and weaknesses analysis of the traditional techniques (table 4), they put forward an approach based on the use of satellite broadcast TV (the OFEK-system).

Table Fout! Onbekende schakeloptie-instructie.: Critical analysis of classical survey techniques in DE (Schultz et al., 1997)

aspect of survey	mailed	telephone	face-to-face
Administrative, resource factors: <ul style="list-style-type: none"> • cost • length of data collection period • geographic distribution of sample 	<ul style="list-style-type: none"> • low • long • may be wide 	<ul style="list-style-type: none"> • low/medium • short • may be wide 	<ul style="list-style-type: none"> • high • medium/long • must be clustered
Questionnaire issues <ul style="list-style-type: none"> • length of quest. • complexity of questions • control of question order • use of open-ended questions • use of visual aids • use of personal records 	<ul style="list-style-type: none"> • short/medium • must be simple • poor • poor • good • very good 	<ul style="list-style-type: none"> • medium/long • short/simple • very good • fair • not possible • fair 	<ul style="list-style-type: none"> • long • may be complex • very good • good • very good • very good

<ul style="list-style-type: none"> • rapport • sensitive topics • non-threatening questions 	<ul style="list-style-type: none"> • fair • good • good 	<ul style="list-style-type: none"> • good • fair/good • good 	<ul style="list-style-type: none"> • very good • fair • good
Quality issues <ul style="list-style-type: none"> • sampling frame base • response rate • response bias • knowledge about refusals • control of response situation • quality of recorded response 	<ul style="list-style-type: none"> • usually low • 45-75% • medium/high • fair • poor • fair/good 	<ul style="list-style-type: none"> • low • 20-90% • low • poor • fair • very good 	<ul style="list-style-type: none"> • low • 65-95% • low • fair • good • very good

Next to lectures, the OFEK-system is used to present multiple-choice questions presented to students at all locations. This evaluation procedure takes place during a special intermission during class. Question and response-choices are presented on the screen. The students punch-in their choices on the phone-keypad. Data are stored for subsequent analyses. This survey method is a combination of face-to-face interviews and a group interview. It has some characteristics of a face-to-face interview mainly because the evaluator can ask complex questions and explain them on-line, use any visual aids. Experiences with this new approach indicate a *higher student involvement, higher response rates* and a *richer set of evaluative data*. In Australia Jegede (1997) developed an on-line evaluation system. The study also revealed positive reactions from staff and students.

When the Netherlands Open University introduced its new “Studienet” (an Internet-based working environment for all students), part of the baseline evaluation studies were carried out through the Internet. Students can answer on-line questionnaires, checklists, and/or become involved in evaluative discussion groups. This new approach is gradually replacing the traditional paper and pencil method for developmental testing and follow-up studies to monitor course quality.

3.1.2 Performance indicators

Developing baseline studies introduces a discussion about the performance indicators to be used. Landstrom et al (1997) give an overview of the ones that are used (**Fout! Onbekende schakeloptie-instructie.**).

Table Fout! Onbekende schakeloptie-instructie.: A list of performance indicators applicable to (D)DE-settings

INPUT	PROCESS	OUTPUT
student /client enrollment	withdrawal rates	number of graduates
faculty credentials	failure rates	completion rates
quality of facilities equipment/materials	faculty and staff development	total revenue generated
staff qualifications	number of grievances	number of participants
grants received	number of courses offered	number of people
advisory committee	clear goals/mission	academic accomplishments

internal funds allocated	policies developed/guidelines and procedures	student attainment
external funds raised	variety of courses offered	research projects
entry qualifications of clients/ students	ratios	
	response time to inquiries, petitions, counseling requests	papers written/published
quality of equipment	average turn around time for DE	revenue increases
awards	number of appeals	student achievement awards
recognition	faculty & staff satisfaction/testimonials	student performance grades student employment upon graduation

The authors conclude that performance indicators are mostly *institution-specific*. In the context of this report we ask the question to what extent this overview already reflects a specific *DDE/DDL-tradition*? Does it take into account the potential of ICT-use and its impact on performance? The answer is that neither in the literature nor in reports from practitioners we have traced a thorough rethinking of performance indicators in view of 'digital' possibilities.

Regarding evaluating (D)DE in the context of *developing* countries, Ramanujam(1997) questions the point that often the perspective of developed countries is used when performance indicators are developed. In stead of articulating performance indicators and their measurement, the debate in developing countries is more oriented towards the following type of questions:

- Can some sort of education reach the people?
- Can shrinking educational budgets meet the minimum infra-structural requirements of (new types of) (D)DE?
- Are there job opportunities for those who complete their studies through distance mode?
- Are there enough arrangements to provide education to those who want it, irrespective of its use value?

The performance indicators mentioned earlier reflect a feature that distinguishes distance education of the developed countries from that of the developing world: i.e. the final goal of the (D)DE program. In developed countries the final aim is to provide education to individuals. In developing countries the aim becomes more a collective one such as 'helping nation building', reducing illiteracy, rural development, health education, tribal education and education of the socially disadvantaged (next to the usual academic, technical and vocational program goals).

3.1.3 Findings on performance

In China, TV is heavily used to deliver education at a distance. Analyzing descriptive student parameters helped the Human TV and Radio University (Zhenfang, 1997) to detect the imbalance in the development of TV education between big cities and remote districts.

The analysis of descriptive data can be helpful to follow-up DDE/DDL-initiatives. Griffith (1997) describes a project in Costa Rica where satellite broadcasting of TV-programs has been used to link up rural areas with less than 2,500 inhabitants. The

project (Telesecundaria) has demonstrated success from 1968-1996, with an annual growth rate of 19.6% in student numbers, 15.1% in schools, and 19.8% in teachers' numbers. Costa Rica's Telesecundaria teacher training was held October 1996 and from 1997 on. Telesecundaria was launched as a three year pilot, serving as a model for other applications in the region. The project includes making available 3,600 TV programs, 15 minutes each, for a total of 900 production hours. Program themes include Mathematics, Spanish, Social Studies, Science, Art, and Technology. Analysis of data by Nhundu (1997) in Zimbabwe indicates the societal impact of distance education on participation of specific student audiences. When the national Center for Distance Education started in 1993, 30% of students on this program were female, compared with 20% who were on a parallel program offered conventionally. In 1996 54% of the students were female compared with 18% on the conventional program. Similarly, rural participation in university education has been greatly enhanced through distance education. 78% of the students came from predominantly rural areas.

Wu (1997) analysed the problem of aged students in Taiwan and how distance education (building upon TV broadcasting) could take into account the characteristics of elder learners. She listed the following methods for improving the aged learning process in the distance education-setting:

- Self-paced adjustment
- Organization of material
- The use of mediators
- Improvement of learning motivation
- The use of feed-back

Sungsri (1997) conducted comparable research involving more than 900 elderly people in Thailand. Some results were the following:

- preferred media were: television, the radio, video, audio tape and printed media;
- personal contact with experts, staff of related agencies and abbots or monks was important;
- the place for Distance Education could be the own home, a local temple, a village Reading Center or the local school;
- type of knowledge and information concerned (top 5): health and hygiene, religion and culture, environment.

Kumar and Madhumita (1997) evaluated the outcomes of a faculty development program based on the use of video teleteaching in local centers at Ahmedabad, Bangalore, Bhopal, Hyderabad, Jaipur, Madras and New Delhi. Analysis of pretests and posttests conducted in their respective centers showed that the participants gained significantly in terms of their learning outcomes. Structured feedback responses and reactions in the valedictory session reinforced the need for further video tele-teaching courses for faculty and other working professionals. This project was part of the AT & T Global Distance Learning Initiative.

With regard to evaluating the impact of (D)DE on *course level*, we observed a large variety of studies:

- At *course level* attention is focused at analysing intermediate results, student performance, and milestone products.

- *At the level of a set (or programme) of courses* the focus is on study speed, drop-out rates and number of certificates/diplomas awarded.
- *Repeated measures research* is also taking place, in which comparable sets of data are gathered annually. The yearly educational quality reviews (Jaarlijks Onderwijsonderzoek) of the Netherlands Open University are typical examples in this perspective. The same cohort of studies was followed year after year and trends analysis could be carried out to monitor the evolution of student performance.

Our review of the literature and the field in the context of developing countries did *not* result in finding many similar examples here. One example is research by Upreti, Youngblood and Rotem (1997) who studied the impact of learner interaction with tutors and fellow students on learning achievement in a DDE/DDL program for Continuing Nursing Education in Nepal. Their findings suggest that students studying in distance mode will benefit when:

- they have access to a well trained local tutor, when they require it and;
- they have a well organized mechanism for contacting their fellow students to get both moral support and content-specific help, again when they need it. This feedback-mechanism could be in the form of study groups, a study partner, or other structured ways of getting students interacting with each other, either in person, or using interactive communications technologies such as e- mail or Internet “chat rooms”.

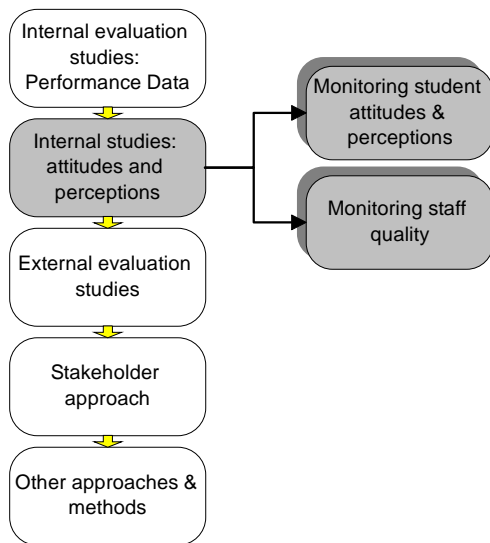
3.1.4 Conclusions

- In the evaluation literature on distance education, attention is paid to the opportunities information and communication technology can have for data-collection.
- Performance indicators assessing distance education activities are developed and available. They can reveal interesting findings (eg on the difference in coverage level of distance education between geographic areas).
- It is important to take notice that performance indicators can be culturally ‘incorrect’.
- Performance indicators specifically focused on digitized DE (distance education) we did not come across in the research literature.

3.1.5 Recommendations

- When establishing DDE/DDL-initiatives, we recommend to develop specific indicators when information and communication is a central characteristic of distance education activities.
- We also recommend to assess what in practice has been done with information resulting from performance indicators. To what extent have distance education programmes indeed been modified, due to this type of information?

3.2 Internal evaluation monitoring attitudes and perceptions as well as staff (quality)



3.1.6 Monitoring attitudes and perceptions

Moving from traditional media-usage in DE to DDE/DDL brings about changes in the learner involved in the new setting. Calder (1997) reports on a (UK) study based on interviews to get an insight into these changes. Two sets of in-depth semi-structured interviews were carried out with 34 participants, with an interval of six months between each interview. The study identified four factors which were likely to inhibit people's demand for particular resources. These were:

- lack of awareness that the resource existed;
- restricted access to the resource;
- neither direct experience of using the resource nor knowledge of anyone in their networks with experience of using it, and
- lack of empathy with it.

Vunnam (1997) describes how the use of audio, radio and video was studied by its own Center for Evaluation in India. The follow-up studies helped to clarify strengths and weaknesses of the technologies, especially considering the student profiles. He discovered that a large number of technologies were hardly used, like the radio session, the video tapes and the audio-tapes. In part this is explained by the fact that clients were not *aware* of the existence of these provisions. He stressed that judgment about the adoption of new technologies should be made on the basis of educational and operational criteria and better not be dictated by the level of advancement of technology. He next gives a list of critical features of radio, video and audio.

A case study, again in India, tried to elicit student and counselor responses to the impact of technology (radio, audio, video) on their learning and support services (Rao, 1997). Based upon questionnaires sent to 6000 students and 800 academic

counselors the analysis revealed an entirely different *perception* of the students and counselors to various issues on utilization of technology at the study and training centers. The disparity between the expectations of the University authorities and the expectations of students on some important issues called for serious rethinking. Next to data about students not knowing about the technological provisions, Rao also puts forward the following: "In the Indian context, the ethos which is based on oral tradition and root learning is not conducive for instantaneous adaptation to high-tech gadgetry."

Uppalapati (1997) developed a comparable study involving 600 students affiliated to 3 rural study centers. Building on data from a questionnaire he found that when a question was posed about their *opinion* on print media and electronic media, about 89% of the students said that 100% of their needs were fulfilled through print media. 6% of them responded that the electronic media was marginally useful only and 5% of them said it had insignificant use. The general view of the students was that the so called *electronic media components* were prepared as *isolated parts* rather than as an *integrated whole*. They strongly advocated the need to integrate the printed, and electronic media components and to go for a more synthetic approach to the learning process. They also expressed that visiting the study centers in order to listen to audio cassettes or to view video tapes on days other than counseling dates, would involve relatively heavy expenditures for them.

In the evaluation carried out by Upreti et al (1997) it was found that students studying in distance mode will benefit most, when having a *well organized mechanism* for *contacting their fellow students* to get both moral support and content-specific help from peers. This mechanism could be in the form of study groups, a study partner, or other structured ways of getting students interacting with each other, either in person, or using interactive communications technologies such as e- mail or Internet "chat rooms".

Bahack (1997) (Israel) analyzed the expectations of students before moving from the traditional printed learning materials towards the use of TV and satellite meetings. In a first survey 300 teachers were interviewed by phone. 82% of the teachers preferred to enroll to a tele-course that offers written material as well as the televised program, and considered written material to be the most important component of the course.

A second survey included 151 students of the Open University of Israel attending four Mathematics courses which offered instructional meetings via satellite as part of the courses. The survey revealed that although the students were highly *satisfied* with the new technology, 75% of those questioned reported that they would *prefer* to enroll to a course that included frontal instruction meetings as well as meetings via satellite.

Within his own organization, Mohaiadin (1997) carried out a study in relation to Compressed Video Conferencing for Distance Learning, involving 47 teachers taking a Bachelors of Education at a distance. Next to information about technical problems, the study presented data on client's level of *satisfaction* with the educational set up, the time management, the perceived benefits and its efficacy.

3.1.7 Monitoring staff (quality)

Staff (quality) is a key variable in any (D)DE-initiative, whether it is an academic program or a short-term training activity. Important evaluation questions are:

- To what extent does staff development build upon partnerships and/or collaboration with other institutes / organizations?
- Does staff development follow a multitude of paths to develop the skills required for (D)DE at the short and long term or is it a single shot initiative?

In several internal evaluations attention is paid to the quality of staff. Aderinoye (1997) presents a historical analysis of the quality of the staff of DE-institutions in Nigeria. The inadequacies observed in the human resources have led the researcher to define ways and means of meeting the training needs of the distance education process in Nigeria. He also has proposed a staff development model. His model includes special training sessions, self study packages, professional qualification programs at a distance or on-site, fellowships, study tours, visitation programs, regional workshops with other DE-institutions and the encouragement of a national and regional professional organization of distance education.

Evaluations of staff quality are also carried out *externally*¹². Mayer & Roy (1997) for example describe a Canadian-Chinese collaborative project that helped to set up DE-programs in Western China, targeting upon remote and marginal populations. The project focused upon an external analysis of staff expertise and consequently the empowering of the local Chinese distance education-center. The approach adopted consisted of sending introductory packages, visits to China and Canada by the trainers and the training of trainers. The Canadians resisted the tendency to transfer a Canadian model. They helped the Chinese to build up their own model by pursuing the following aims:

- provide training in course design and development, including minority and gender-sensitive student support and tutoring;
- participate in the process of training Chinese personnel in the philosophy and methods of distance education;
- assist to train “trainers” who can then expand the Chinese base.

Staff expertise seems to be a key to start up DE-initiatives in developing countries. Chacon (1997) (Venezuela) presents an analysis of the growth of distance education in Latin America. He finds that there indeed are training programs for systematic development of staff, focusing on distance education and information and communication technologies and he also shows the importance of them.

In an international collaborative project, institutions in three countries (Brazil, UK, USA) designed in two phases a DDE/DDL package for teacher training in the field of environmental education; a topic of prime importance in developing countries (Faria et al, 1997). Although the project is currently under evaluation, the authors indicate a very positive impact of their World-Wide-Web-based course (internet-delivery and interaction, but fax and voice facilities may have to be used due to resource restrictions in remote regions).

¹² Although this section is oriented towards internal evaluations, in stead of drafting a new section focused only on external evaluations of staff (quality), we thought it wiser to add the few external evaluations of this variable here.

3.1.8 Conclusions

- Quality of the staff is being evaluated, both qualitatively and quantitatively.
- The ways in which staff is trained are also being evaluated.
- In the research literature there are many examples of empirical studies into perceptions, opinions and cognitions of students/clients regarding forms and cases of distance education.
- With regard to attitudes and perceptions of students/clients regarding digitized distance education, it appears that when digitization is not part of a more integral, holistic approach to Distance Education, the attitudes are not very positive.

3.1.9 Recommendations

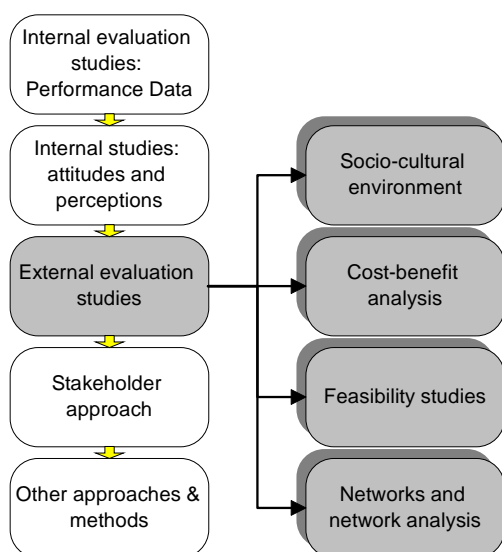
We recommend that DDE/DDL-initiatives should:

- monitor the knowledge students have about particular provisions in the new setting;
- monitor the level of integration of the different delivery media used in the setting;
- check the relative importance students attach to different delivery media.

With regard to the variable 'staff', the findings suggest:

- to follow a multitude of paths to develop the skills required in staff development;
- to focus both upon projects at the short and long term.

3.2 External evaluation studies¹³



We first look into evaluations that pay attention to the national and local (*socio-cultural*) *environment* in which (D) DE takes place. Given the emphasis on 'local ownership' of activities facilitated by the World Bank/EDI, we believe this is an important characteristic of both (D)DE and evaluations. Secondly, we bring together some *cost-benefit studies* while thirdly we will look into evaluations focusing on the *feasibility of (D)DE*. Finally, we pay attention to evaluations concerning *networks and partnerships in (D)DE*.

3.2.1 The socio-cultural environment

Analysis of the socio-cultural environment includes linking specific societal institutions to combine forces in a DDE/DDDL-context. Wang (1997) presents a critical analysis of community antenna television to reach adult learners in the community. Her analysis is that a more powerful system could emerge if the following happened: building 'learning communities' by combining this approach with schools, societal groups and professional organizations. This community antenna television here includes system owners, channel owners, and program's producers. Groups are different organizations for profit and non-profit purposes in the community. Social education institutes are government's departments that are partly responsible for adult's continuing learning in Taiwan like museums, cultural centers, libraries, and social education institutions. Community adult education

¹³ In our review of the literature and the field, we did not find:

- assessments of markets;
- evaluations dealing with the scalability of initiatives; and
- analysis of work flows.

institutes are the varied professional organizations that are waiting to be established to be the major provider of adult education.

Takwale (1997) (India) shows that (D)DE initiatives have to be embedded in a societal environment that combines the home, the workplace, regional resource centers and community learning centers. He describes how in India the national and state open universities and correspondence course institutions are being organized under the auspices of the Distance Education Council into an Open Educational Network (OPENET) by establishing:

1. A network of physical and intellectual resources through study centers (Resource Centers) spread all over the country.
2. Teleconferencing and broadcasting network of presentation/ teaching end rooms and receiving end rooms established at regional and study centers and ultimately made accessible to learners at home.
3. Information communication network (e-mail, nicnet, Inet, Internet etc.) for communicating information and academic services

The Components (2) and (3) may get integrated electronically. With a flexible and modular approach, the partnership of conventional and non-conventional providers of education, the OPENET offers a unique '*networked system*' of education.

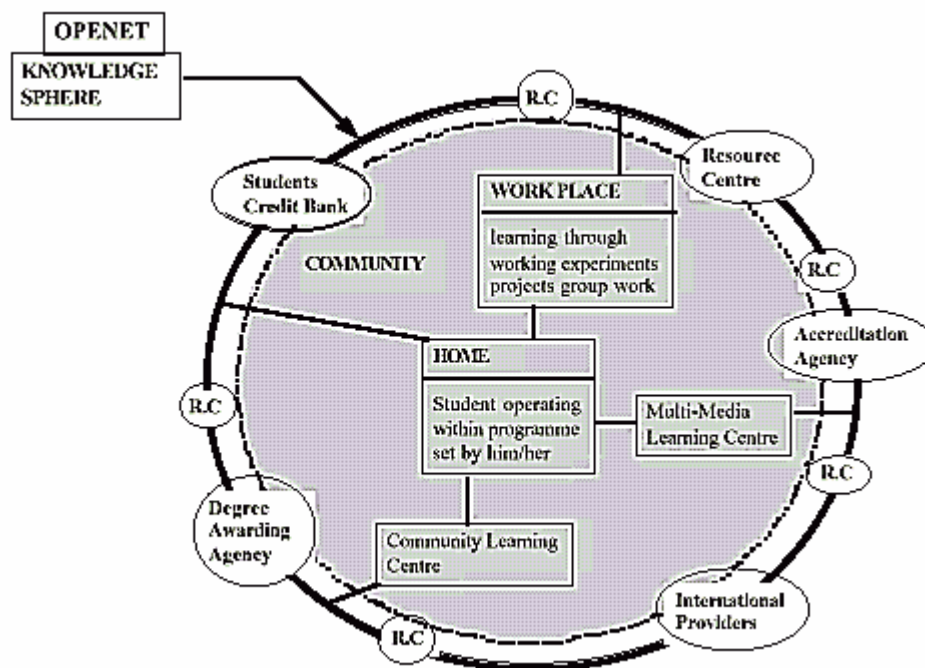


Figure Four! Onbekende schakeloptie-instructie.: Student - Centric Networked System of Education (OPENET - Open Education Network)

For the World Bank/ EDI, the above described developments are important because they can lay the groundwork on which local distance training activities (organized or facilitated by the Bank) can be added.

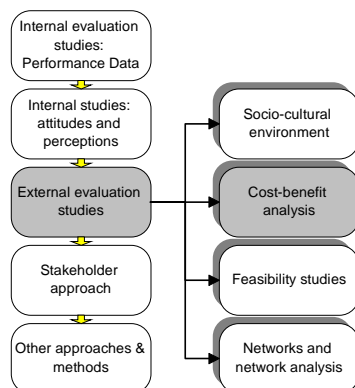
In order for (D)DE to be acceptable by the socio-cultural environment, including local communities, it is important to assess whether or not (D)DE-initiatives are linked to existing communication and interaction channels in a developing society. The following example is of particular relevance in this perspective. In describing the

approach adopted in Nigeria to use radio as a medium in distance education, Tahir & Umar (1998) stress the fact that evaluation was an *integral* part of the use of the open broadcasting strategy to attain objectives put forward by the National Commission for Nomadic education. Data were collected from interviews with the "Ardo's" - i.e. community leaders and listeners. Results indicate that there indeed was a positive *reception* and that children were more often sent to school as a result of listening to the broadcasts and community discussions.

A review of the literature conducted by the Commonwealth of Learning in 1997 to detect constraints or barriers for the effective diffusion and integration of educational technology in DE in developing countries resulted in the following list of topics (McWilliams & Khan, 1997):

- DDE/DDL-initiatives are faced with the dilemma of reacting and planning within a broader national context over which the education sector has little influence or control. Essentially, this means that although an educational institution may be aware of the advantages of incorporating technologies into their delivery and support services, the absence of an adequate national policy framework and infrastructure combats these intentions.
- The second factor is the 'human factor'. There are several aspects within the human factor which may impede or hinder the effective adoption and utilization of technologies in distance learning, including the level of awareness of the potential of technology, attitudes towards change generally and in particular towards technology, managerial capacity and level of skills related to the effective application of technology within the staff of educational institutions and related organizations. Communication is seen as an important factor by a number of authors.
- A further limiting factor is that of existing social, cultural and political climates and environments. Several references are made in the literature to these imperatives as significantly influencing decisions related to the adoption and diffusion of technology. The concept of 'appropriate' technology and the development of indigenous technologies are argued by several of the authors.
- In conclusion, the theme of *capacity building for (digitized) DE* is noticeable in the literature. The development of an *institutional capacity, a human capacity and a technical capacity* is an underlying requirement for the effective diffusion and integration of educational technologies.

3.2.2 Cost-benefit analysis



Cost-benefit analysis is related to the field of the “economics” of education and relies heavily on models taken from the business field:

- pay-back and break-even (PB)
- return-on-investment (ROI)
- net-present-value (amount of \$ to be invested in order to gain a certain return in the future, NPV)
- internal-rate-of-return (IRR)¹⁴.

Considering the fact that information and communication technologies used in DDE/DDL efforts often require rather large investments, we expected to have many cost benefit analyses available. Reality appeared to be different. Though we were able to find some studies dealing with non-credited (company-linked) learning and training activities (section 1.4), that many cost-benefit studies to be located in the research literature we did not ran into. While scanning the field, we were informed¹⁵ by researchers, auditors and financial controllers that their superiors often were not that interested in cost-benefit analyses; they hardly got approval to start project activities in this field. Concerns about return on investment did seem to be in conflict with positioning the own institutions with a new digitized distance education / learning product in a competitive market. In these cases the new product was considered as a future investment following a “pump-priming” approach: a way to market the product and institution. These examples clearly suggest that “evaluation” is to embedded in an ‘evaluation infrastructure’, which can prevent that these things happen. (cf. section 4).

In the field of distance education, a variety of cost-benefit-*models* are available. Keegan (1990) gives such an overview and refers to the well established model of Rumble. The costing of distance education is also well established and can be described as

$$T = F + aL + bD + gC + xS$$

where	T	=	total recurrent costs
	F	=	fixed recurrent costs
	L	=	number of local study centers
	D	=	number of courses in development
	C	=	number of courses in presentation
	S	=	number of students
and	a	=	average cost of a local centre
	b	=	average cost to produce a course
	g	=	average cost of presentation of a course
	x	=	average cost per student.

Bates (1995) presents a comparable formula that expresses costs as “dollar cost per student contact hour”. In his overview he discusses the costs-factor in relation to most of the technologies relevant for DDE/DDL. But there are two major problems with this at first hand useful overview:

1. only financial costs and benefits are considered;
2. the information is based on experiences in developed countries (especially the UK).

¹⁴ We also recommend the reader to consult the internal documentation of the World Bank on the issue of cost-benefit analysis. The authors did not incorporate the vast body of experience available within the World Bank in this report; this would have looked redundant.

¹⁵ Part of this information was passed on to one of us in a confidential way.

In developing countries, some evidence is available that (D)DE indeed is cost-effective. Jewett (1997) could - after studying the approach adopted by Renselaer Polytechnic, California State University and Old Dominion - conclude that:

- mediated instruction can generate benefits at least equivalent to classroom instruction;
- with sufficient enrollments, mediated instruction is less expensive;
- with sufficient enrollment, the same benefits can be realized at lower costs.

With support of the Asian Development Bank, an overview has been elaborated of studies in the area of cost-benefit-analysis (Dhanarajan et al, 1995). A large number of the studies presented focus upon emerging electronic universities, personal computing and TV universities.

For instance, the study of Yenbamrung (1995) compared on-line courses with a face-to-face alternative. His return-in-investment analysis helped to detect key student variables that influence student-cost-effectiveness (i.e. study loan & the use of interactive video instruction). The net-present-value analysis, taking into account time as a value, helped to reveal that the interactive video instruction resulted in a superior net-present-value. The internal-rate-of-return-analysis showed that the off-campus mode was superior since students could work, could avoid a study loan and could get reduced tuition and fees. Yenbamrung stresses the fact that the projects look promising but are snapshots and do not yet show a longitudinal picture.

Kirkwood & Ismail (1995) revealed that the use of DDE/DDI might transfer the cost of learning to the home-situation. This then results in a higher cost-effectiveness for the institution but not for the student or client. Although students could loan a computer from the institution (redistribution of the cost) there were still extra hidden costs.

Of interest may also be a project at the University of British Columbia ("Developing and Applying a Cost-Benefit Model for Assessing Tele-learning") (Bartolic, 1998). In this project, she applies a cost-benefit analysis to on-line courses (N=6, all set up from within Canada). An example is the analysis in relation to the course "Develop, design & delivery of technology based distributed learning (course code EDST 565f)". She compares the analysis results with a face-to-face setting that builds upon printed materials. Her analysis resulted in quantitative evidence to state that the on-line design was cheaper than a traditional design, production and delivery approach. Her study also revealed:

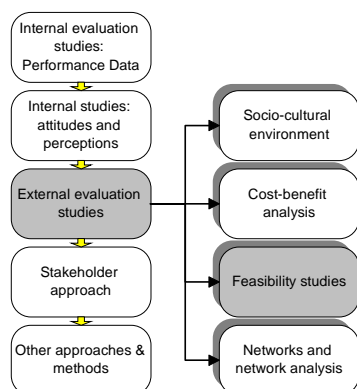
- different stake holders present different perspectives on costs and benefits. An example concerned the definition of cost for the staff. The university is of the opinion that professors cost more when they are involved in face-to-face teaching and training than when they are participating in the on-line variant;
- calculation models have to be checked. Institutions seem to be blind for certain hidden costs and benefits.

Appendix 1 in section 7 shows a calculation model as it was applied to the on-line course. Bartolic also pays attention to the types of benefits digitized distance education may reveal other than only reducing expenditures. She refers to:

- performance driven benefits (learning outcomes, satisfaction);
- value driven benefits (access, flexibility, ease of use);
- societal or value-added benefits (e.g. reduce pollution).

A number of studies indicate that in general the cost/per student is lower in (D)DE institutions as compared to conventional institutions. Considering higher education as an example this is clearly the case for India, China and Thailand (Ansari, 1994; Xingfu, 1994; Teswanitch, 1994). But the cost effectiveness in terms of cost per graduate or credit or much higher due to the low completion rate and the high average length of study.

3.2.3 Feasibility studies



Veena and Phalachandra (1997) (India) did develop a primary teacher training project based on interactive television in close collaboration with the Indira Gandhi National Open University (IGNOU) and the Indian Space Research Organization (ISRO). The project was set up to study the feasibility of using interactive video technology (one way video and two way audio) as an alternative to the cascade approach to train relatively large numbers of teachers, assembled in different centers with the help of few experts.

In a 1996-run of the project, 847 teachers in 20 centers participated in a 7 day program, supported by local on-site facilitators. The evaluation made use of questionnaires, observations and posttest analysis. The results were very positive:

- the methodology used in the experiment was found to be better than the conventional method;
- telephone communication proved to be very useful;
- answers given by the experts were found to be satisfactory, relevant and useful;
- the conduct of the program by the panelists and moderator was considered to be of a good standard;
- better understanding of child-centered and activity-based teaching could be shown, while also the significance of minimum levels of learning was underlined;
- the teachers reported that the program was "effective", "created interest", pepped up their "enthusiasm", "improved our capabilities" and even felt "superb".

The project shows the impact of inter-institutional collaboration, shows the importance of local facilitators and local ownership and the relevance of *"interactivity"* in the DE-design.

Not fully to be considered a feasibility study, is a project carried out in Slovenia, when this country adopted for the first time a (D)DE study program. Zagmajster and Bregar (1997) were concerned to assure high quality of the (D)DE program and to foster the reputation of the DE-format in the eye of other educational institutions. The University

of Ljubljana therefore developed - *before the actually start of the project* - a large scale *evaluation program along with the introduction* of the first ten courses. The learning materials comprised next to written materials also audio tapes and computer programs (cf. Bregar & Zagmaister, 1996).

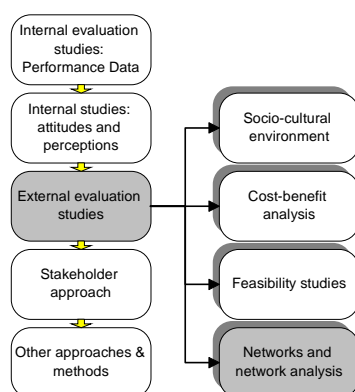
The main variables studied were the following:

- the DE course in general;
- study materials;
- the tutors' work;
- the professors' work;
- the administrative staff' s work;
- students (demographic and other general data, study habits, conditions for study, social background etc.);
- assessment procedures;
- financial matters;
- DDE/DDL information system and facilities and
- the organizational structure of DDE/DDL.

The methods of collecting the information were the following:

- students filled in questionnaires on enrollment and after completing each course;
- meetings and discussions with students, management and counselors; ,
- a workshop with professors and tutors;
- an expertise report/review written by an expert on DE-study materials;
- a peer review by two foreign well-known DE-experts;
- discussions with computer specialists and other staff and a
- data base of students' exam scores.

3.2.4 Networks and networks analysis



Earlier in this report we stressed the importance of *collaboration* and *partnering*. What do evaluations say about these topics?

Shahabudin (1997) describes an effort to pool a variety of resources to set up a DE-postgraduate program in Family Medicine. The attempts made by a university in Malaysia forge linkages with the Ministry of Health in this country and a number of other organizations:

- a policy-making body concerned with the academic program and accreditation;
- the Commonwealth of Learning which assisted in the development of distance education technology;

- the World Health Organization which assisted with program development and evaluation
- “Telecoms Malaysia”, which assisted with the network installation and special tariffs.

The collaboration focused upon several issues:

- setting rules and identifying roles;
- organizational support and linkages for program implementation;
- learner support system;
- training of supervisors;
- supervision, tutoring, tutoring and counseling;
- assessment; and
- program evaluation.

In relation to the latter, especially the World Health Organization (WHO) and the Ministry of Health Malaysia played a key role. The following variables are periodically investigated in the evaluation:

- recruitment and selection of students;
- quality of the Family Medicine Curriculum;
- supervision and on-site activities in Regional Training Centers;
- inter-sectoral collaboration;
- quality of supervisors / academic staff;
- impact of the Family Medicine Training Program;
- quality and development of the graduates; and
- network of centers of excellence.

Pérez (1996) concludes - after analyzing strengths/weaknesses of the Virtual University for Mexico - that the use of this DDE/DDL mode proved to be *successful*, considering the increase in student enrollment, because of building up a new *model of education* that grounds in the local culture. He calls this model “*Network education*” to stress the fact that networks are inter-linked. The 26 campuses that are coordinated have satellite reception facilities for the two transmission sites located in Monterrey City and the state of Mexico sites. Reception centers are classrooms equipped with large monitors and/or projection screens, as well as computers directly connected to the Remote Interaction System based on the internet-protocol.

Nti (1997) presents an overview of things to consider when setting up (international) collaborative DDE/DDL projects. She indicates that challenges facing educators developing and delivering programs to international audiences arise mainly out of:

- cultural differences like language differences and its reflection in terms of perceptions, attitudes, and beliefs;
- economic differences (cost differentials for tuition payment and for acquiring the technology for distance education);
- pedagogical and instructional differences (teaching styles and styles how learners process information);
- administrative differences (registration of learners, accreditation, enrollment and regulations) and
- technological differences (level and use of technology, learners responses to various technologies).

She presents strategies to cope with these differences like performing audience analysis, course development that also take into account differences in terms of language, pictures and copyright), media selection, teaching strategies and, what the World Bank would call, 'pedagogical approaches or scenarios'. The Bank stresses that delivery mechanisms and methods of distance education "will be integrated based on what are called Pedagogical Scenarios. These Scenarios are developed and modified in response to the course subject matter, the needs and requirements of the learner, the relative emphasis of synchronous versus asynchronous interactivity and the capabilities and capacities available at Learning Center sites"¹⁶

¹⁶ .Pedagogical Scenarios are described as four course types:

- Course A is predominately delivered by videoconferencing/interactive TV.
- Course B is predominately delivered by videoconferencing and/or interactive TV but also incorporates asynchronous activities in print, Internet/WWW or CD-ROM.
- Course C is typified by more asynchronous activities and only periodic sessions convened by videoconferencing and interactive TV.
- Course D comprises almost exclusively asynchronous learning activities.

The World Bank's Interactive Classroom is the originating site for delivery of videoconferences and interactive Television. EDI internet/intranet computer servers, also located in Washington, will act as the technological hub around which asynchronous programs are managed. LearningSpace is the integrated course development/delivery package that will be used as the primary means by which asynchronous course delivery is managed and facilitated. LearningSpace also has the capability to facilitate interactivity for videoconferences and interactive television events and can facilitate computer based synchronous communications through its discussion forum and chat room features.

Setting up *international* networks to support the *local* development of DDE/DDL can be a disguised way to introduce 'neo-colonialism' in developing countries. Roy (1997) indicates how Malaysia has been reluctant to set up partnerships with international organizations. She gives a set of small scale examples involving, like the British Open University, in which the empowering of local institutions and the building up of local expertise is the *predominant* approach to collaboration and not the "*import*" of products of developed countries. She also refers to the importance of building upon international agencies acting as *neutral bodies* that may help and she refers to the Commonwealth of Learning.

Ramanujam (1997) presents material that is linked to this problem of 'import' in a review of models to set up (digitized) distance education in developing countries. His analysis of attempts and programs in Latin America, Africa (Ethiopia, Zambia, Kenya) and Asia (Indonesia) brings him to the following statements:

- Indigenous models for distance education (e.g. based on oral culture), though very difficult to evolve, once created will have greater relevance and strength than the copied or adapted models;
- The future of distance education in the developing countries would depend more on this ability of distance teaching institutions to respond to the specific needs of learners at different levels and less on their success to catch up with their counterparts in the developed world.

A report of an UNESCO and ICDE evaluation team of the Indonesian Open University confirms these statements. Ramanujam (1997) next presents a list of exemplary projects that especially build upon this needs analysis model and indigenous models of distance education: Costa Rica and Venezuela. The success of the concept rested in part on the use of communications technologies which already existed in the region and in part on the decision by the planners to adopt an essentially conservative approach to academic policies.

The critique of Ramanujam is in line with the conclusions of Ross (1997), when analyzing 15 years of worldwide distance education experiences: "Prominence is too often given to technological issues without first making explicit the kind of university needed for the new millennium -- its mission, mandate and primary goals. Instead, especially among those for whom "high tech" applications are the new panacea for all the ills of our current educational system, ideological models of a university are assumed or there is too little recognition of the implicit culture changes that these new technologies will require." (Cf. Mason, 1998).

3.2.5 Conclusions

- The socio-cultural environment, both on the local as on the national level should be taken into account when performing evaluations;
- that is also true for the embeddedness of DDE/DDL initiatives into the workplace, regional centers, community centers and the home;
- with regard to cost-benefit analysis, the assumption that relatively large numbers of CBA with focus on DDE/DDL were available, did not come true;
- there appears to be a certain reluctance in carrying out this type of evaluations, because stakeholders consider digitization a specific asset in competing other

organizations, which may make it difficult to have 'objective' data on costs and benefits of digitization available;

- however, cost-benefit analyses that have looked into Digitized DE are in general positive about this approach;
- with regard to feasibility evaluations, we found some examples making use of a multi-method approach;
- networks and partnerships are important for developing DDE/DDL and they are looked into in several evaluations;
- in some studies the importance of 'pedagogical scenarios' or 'learning models' are mentioned, but they are not yet evaluated properly and in depth;
- again it turns out that the 'import' of DDE/DDL models from developed countries into developing countries is critically received.

3.2.6 Recommendations

Recommendations with regard to the variable 'environment':

- Check whether the environment of a DDE/DDL-project offers opportunities to share resources; such as libraries, community centers, the workplace;
- look for partners that help to strengthen initiatives;
- analyze what (existing) communication channels and approaches are available to spread interest in the DDE/DDL-initiative;
- set up research to define "appropriate technologies" for developing countries;
- check whether capacity building is also necessary in the environment of the project (e.g., at institutional level, community level).

Recommendations with regard to cost-benefit analysis

- Define non-financial costs and benefits to be incorporated in the analysis (performance driven benefits, like learning outcomes, level of satisfaction), value driven benefits (access, flexibility, ease of use) and societal or value-added benefits (e. g. reduce pollution);
- have an answer ready to the question to what extent the variables in a cost-benefit analysis are derived from the specific digitized distance education-setting in a developing country?
- Is the analysis based on data from a sufficiently long period?
- Focus on the perspective of different stake holders when calculating costs and benefits (e.g., the institution but also the client).
- Has there been an objective check on the calculation models used?

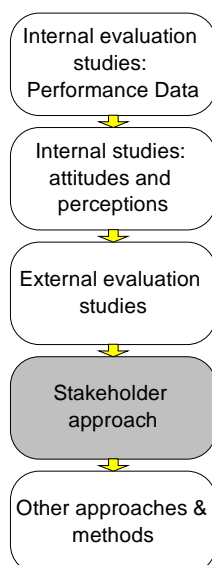
Recommendations with regard to network /network analysis

The list of studies reviewed helps us to extract the following recommendations/guidelines:

- Delineate for what parts of a DDE-initiative partnership is to be preferred; e.g., for design and development of a program but not for the actual exploitation;
- Involve specific partners with specific expertise (e.g., telecommunication partner for setting up the communication provisions);
- Consider differences between (national and international) partners in a partnership; e.g. cultural, economic, pedagogical, administrative and technological differences;

- Be aware of project features which might be interpreted as neo-colonialism.

3.3 Evaluation studies in which a stakeholder approach is used



A list of potential stakeholders can be viewed in two ways:

1. as a list of potential target audiences to be involved in a (D)DE-evaluation activity or
2. as a list of perspectives that define the orientation that is to be taken into account within an evaluation.

The next scheme presents important stakeholders that can be found in evaluations of (digitized) distance education.

External	<ul style="list-style-type: none"> • funding agency (governmental, private) • policy and decision makers (local authorities - national authorities, religious authorities,...) (civic society) • employers (specific or sector) • partners in a partnership • representatives of other DDE-projects/initiatives • alumni
Internal	<ul style="list-style-type: none"> • student/client • student client peer group(s) • content specialist • tutor • counselor • teacher/professor • section/faculty decision level • institution decision level • administrators

Silong (1998) explains how in a partnership approach between the Center for Extension and Continuing Education of the Universiti Pertanian Malaysia and a number of commercial partners, the *terms of the partnership* were monitored and had to be reconsidered after the first stage of the program was finished.

Farnes et al (1994) carried out a study related to a new collaborative DE program in Hungary "The Effective Manager" (printed materials, video- and audiocassettes). The study focused upon performance indicators at the level of the individual client, at the level of the organization and at societal level (i.e. as job changes and the number of course topics applied in the job (like change management, conflict management, time and stress management.). In this way the developers and researchers focused also upon diffusion effects (transition towards a market economy) of the DE-program. The results of the study refer primarily to the role played by the *employer as a stakeholder* in the program (ibid, p.116). It was found that to maximize the adoption and application of what is learnt from the courses, employers had to sponsor:

- those from senior levels;
- ensure that they are in frequent contact with each other;
- enable them to work together to implement changes;
- encourage the transfer of what is learnt to other employees and
- promote those who have taken the course.

Klimowicz (1998) of the National Center for Distance Education in Poland gives an example of a needs-analysis investigation in which - in the context of developing a complete new distance education system for Poland - an analysis was carried out to detect specific needs of *specific social groups*. He also compared this to the way the traditional educational system, which is said not to be able to meet their demands. The Polish study focused upon the following social groups: people in rural areas, disabled persons, the unemployed and teachers. The study build upon data gathered with survey interviews and questionnaires and helped to clarify the needs in terms of:

- what competencies have to be developed for these audiences;
- what is the readiness/willingness to adopt a distance education format of learning;
- which course-topics have to be covered for specific audiences;
- what are the preferred didactic methods and requirements;
- what are the constraints for implementing a distance education system from the perspective of the user (money, motivation, technical background).

In a comparable way, Georgiev et al (1998) examined the educational needs of 6 identified groups of potential customers to be involved in DDE/DDL: (1) school-leavers, (2) students from outside, (3) part-time employed / unemployed, (4) private and state sponsored learners, (5) professionals that look for regular updates, (6) adults seeking training for career changes or personal development. Universities and community based organizations were involved in the study that indicated that especially the group 2,3 and 4 should be focused upon.

Bottomley and Calvert (1995) carried out a study to estimate a stake-holders' (students and administrators) appreciation of potential services, among them e-mail, computer conferencing, on-line library access. In the case of the public policy perspective, the "digital" features got high ratings. But students valued other services, such as telephone services providing group and individual access. The multiple perspectives, revealed in this study question a too fast government or institutional

investment in a computer network. The researchers however also show problems with this kind of data-gathering: “[The] survey design was a challenge as it was not certain that respondents would have any direct experience of the full range of technologies”.

Put in more general terms: it may be questionable to carry out *hypothetical question surveys* under stakeholders who themselves did not have (any) real contact with new media’ in distance education.

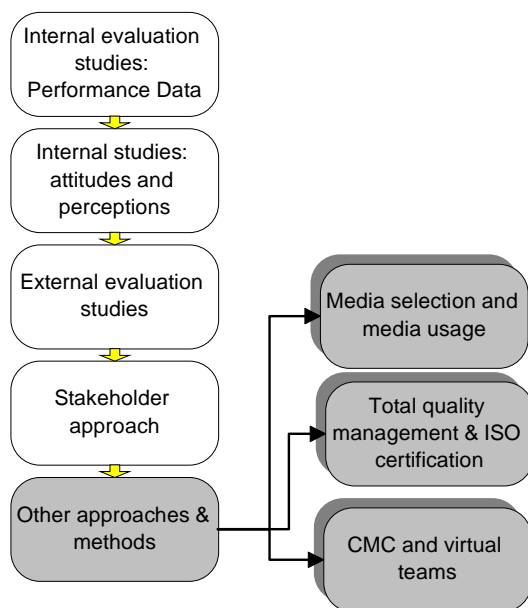
3.3.1 Conclusions

- The stakeholder perspective is important, as was shown in the Hungarian study related to employers’ impact on the success of DDE/DDL;
- with regard to datacollection it is important to pay attention to the possibility that stakeholders hold opinions, attitudes and cognitions about ICT while they themselves did not have any *hands-on-experience*. Although the Hypothetical Question Methodology is useful in interviewing stakeholders, this artefact must be looked after.

3.3.2 Recommendations

- Identify the stakeholders at a variety of levels (target audience, institution, institutional network, national and international) and along a variety of dimensions (educational, economical, societal/cultural);
- Identify the congruencies and/or conflicts in the interests of the stakeholders and discuss them beforehand. Check the level of flexibility in the project to deal with the differing interests of stake holders/partners.
- Monitor the involvement of stakeholders. Consider this as a research/evaluation question in the DDE/DDL-initiative.
- Assuming the availability of a list of stakeholders, importance issues to check are:
 - to determine who the primary audience should be for a DDE/DDL-initiative
 - to determine what the specific needs are of the target groups identified
 - to identify didactic methods and pedagogical scenario’s that are in line with the target groups
 - to detect expectations of the target group about the services that will be provided
 - to know expectations of the target group about the technologies that will be used.

3.4 Other approaches and methods



We will focus on three other approaches:

- evaluating media selection and media usage in (D)DE;
- total quality management and ISO-certification as an approach to evaluation;
- social-psychological studies focusing on computer mediated communication.

3.4.1 Evaluating media selection and media usage

In developed countries a number of initiatives can be observed to develop decision models that support evaluations looking into *media selection decisions*. An example can be found in the work of the Open Learning Technology Corporation Limited (1997). They elaborated an instrument for basing technology decisions in the provision of open and flexible learning and taking into account technology decisions. An elaboration of this model can be found in the reference section. The decision model is to be enriched with a cost-benefit analysis by attaching values to dimensions and variables in terms of dollars or social/cultural terms.

Appendix 2 in section 8 gives a more detailed *media selection decision model* as it has been developed by the same Open Learning Technology Corporation Limited (1997), based upon empirical data and an analysis of the literature.

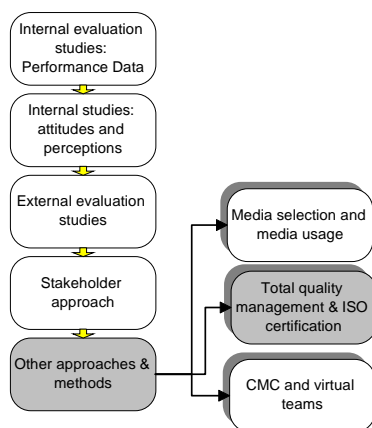
As to media selection, the Education Network Australia presented an annotated bibliography classification that is helpful in the context of our report here. Their materials focus on information gathered in developed countries and contains references in relation to the following topics (Education.AU, 1997):

- models for Evaluating Audio, Audiographics and Teleconferencing;
- models for Evaluating Computer Based Learning Technologies;
- models for Evaluating Multimedia Learning Provision;
- models for Evaluating Interactive Video and Videoconferencing;
- models for Evaluating Television, Radio and Interactive TV;
- general models for Evaluating Educational Technologies.

As earlier indicated when discussing ‘needs analysis’, the choices have to be in line with the cultural and societal setting. Kamau (1997) presents an interesting case in this context when she looked for ‘*culturally adequate media*’ to support literacy distance education programs in Kenya. She proposes the following options:

1. newspapers, wall-newspapers and magazines;
2. libraries for new readers, mobile exhibitions and museums;
3. programs and other non-formal courses of a vocational and general character for out-of-school youth;
4. distance education courses for local study action groups and individuals;
5. traditional folk media;
6. sports, games and physical culture; and
7. radio, TV, video and movies.

3.4.2 Total quality management and iso-certification



Kishor and Saxena (1997) have developed a model of *self evaluation* at the *institutional level* and tried to apply it to their own institution in view of overall *quality control*. Their DE systems incorporates certain features of DDE/DDL (TV, radio and teleconferencing, computers). They especially focus upon the following aspects:

Table Four! Onbekende schakeloptie-instructie.: Quality control at IGNOU

evaluation aspect	elaboration
Access	It refers not only to resource availability but to provide equality of educational opportunities so that education becomes a liberating and democratizing force.
Programs and Courses	<ul style="list-style-type: none"> • Logic of the Courses: To what are the courses offered logical, relevant and meet the needs of distant learners, such as areas where the demand of technically and professionally skilled work force outnumber supply. • Self instructional materials (appreciation and success in other institutions) • Face Value of the Course Materials: This refers to the technical quality of print and • audio-video materials. • Delivery of Products: quality of study centers (buildings and mobile centers). Also the use of interactive technologies, such as teleconferencing are to be considered in this context.
Learners' outcomes	This refers to exit standards at learner level (scores, completion rate and drop-out) and at the employers level
Effectiveness and Efficiency	Price of programs
Impact on other Institutions and Individuals	

Madan (1997) (Indira Gandhi National Open University (IGNOU)) indicates that systematic research into total quality management within open and distance learning systems has been lacking till now: "Despite the willingness of the distance education researchers to put their work to scrutiny, the debate over the agenda of quality assessment of research in the ODLS has been quite conservative." Madan believes that a part of the problem is related to a lack of systematic interest in setting up this research.

Part of TQM sometimes is obtaining an *ISO-certification*. There are examples of distance education institutions that adopted this ISO-certification approach. One of them is SZAMALK , [Számítógépes Távoktatási =Computer-based Distance Education] in Hungary. Zárda (1998) gives an overview of the activities carried out, during a two year process, to acquire the certificate in 1997. Interesting is the observation of Zárda that the following 5 activities were the most critical activities in the ISO-certification process:

- 26.Regulate Curriculum & Teaching Material Development Process
- 27.Curriculum & Teaching Material Approval System
- 29.Process of Recording External Trainers
- 32.Qualify Suppliers of Materials & Services
- 38.Qualify Internal Trainers

Also in Hungary, by the National Council on Distance Education and with the support of the European Commission development program PHARE (94-05), a qualification process was elaborated for distance education (Moson, 1998).

In the context of the Socrates ODL (Open and Distance Learning) Programme of the European Commission, the CALIBER-NET project focuses upon Quality in European Open and Distance Learning. Also aimed at Eastern European countries, the project finalized a ODL quality development guide (Twining & Davies, 1998). Some determining statements in this guide are:

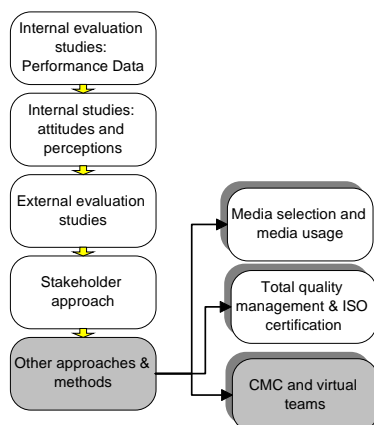
- Gather and/or define clear standards, check who sets the standards for what (e.g. unequal standards for face-to-face and DDE/DDL in terms of teacher costs). Do this before starting the evaluation;
- Define an evaluation 'system'. Define objectives, approaches, organize it (resources, formal position, time line (short and long term policy)).

Maimela (1997) reviewed the *quality assurance mechanisms* of the University of South Africa:

- external examinations or program accreditation;
- external review of institution based upon self an evaluation;
- peer evaluation Other institutions and
- study visits.

Although the approach looks systematic, he warns for a continuous control on the evaluation cycle and insists on external bodies being involved in this process.

3.4.3 Computer mediated communication (CMC) and virtual teams: some psychological studies



Organisations are increasingly involved in developing 'virtual teams' for working together, deliver services and produce goods though they are no longer geographically closely bound to each other. This is especially the case with knowledge workers in which the emphasis lies on sharing knowledge to reach the best possible decisions for policies, opinions and practice.

The main question refers to what is called knowledge management through computer mediated communications.

For the World Bank / EDI with its emphasis on the *World Bank Learning Network, including virtual classrooms*, on team work in terms of policy seminars, workshops and seminars for policymakers, parliamentarians, opinionmakers and practitioners and given the fact that there usually large distances to bridge, computer mediated

communication (CMC) as a mechanism of transferring knowledge can be of particular interest.

The shift from traditional, i.e. face-to-face teamwork into virtual versions is the main reason to look into some behavioural studies of this form of communication. Does CMC guarantee the same (or a higher) level of performance, the quality of team and individual output? What is the perception of people that do not see each other in a physical sense and what kind of impact has the 'cyber revolution' on organisational behaviour?

A second reason is that one might argue that CMC is a (if not *the*) central characteristic of DDE/DDL, this because computers and collaborative learning in one way or the other are central.

While there is abundant research carried out into the effectiveness of 'face-to-face' teams, this is not yet true for virtual teams. Computer mediated communication (systems) are socio-technic systems that support communication-oriented activities through computer-driven collaborative activities. One of the reasons for CMC is that they allow organisations to work together in situations that are not constrained by real time and place. Put differently, CMC helps to make synchronous meetings more efficient¹⁷. "It is estimated that managers spend 60% of their communication time in so called synchronous meetings (Panko, 1992), which include face-to-face meetings, telephone calls, desktop conferencing, Web based "chatrooms". These meetings depend on direct availability of other persons. Moreover they take place in a less structured environment in which it is difficult to always fully explore and understand the ideas, reasons and motivations behind information and decisions. 'Asynchrone meetings' are characterised by the fact that they do not depend on direct reply (such as email, electronic document management, newsgroups, bulletin-board-systems and Internet). Participants in of CMC can allow themselves to think messages over and return a reply whenever they like. These meetings are often more structured. Usually they are based on documents, exchanged through the participants. Compared to synchronous meetings, asynchronous communication usually also takes longer.

But the main issue here is what behavioural impact is derived from CMC. The existing behavioral investigations of virtual teams and CMC can be distinguished into two major fields.

- The first field concerns research into the effectiveness of virtual teams /CMC. The studies pay attention to questions like how virtual teams obtain and share important information and how virtual teams reach consensus and decisions? A third question is how to control and measure the output of a CMC-team and its members?

¹⁷ The World Bank (on its www-site World Bank Learning Network) describes synchronous communications as "those where the transmitter and the receiver are communicating at the same time, or as stated in a previous section, are bcommunicating in real time. The synchronous nature of interactive television and videoconferencing means that learners have to be at a place and a time determined by the schedule of the event. This has the advantage of creating a structured environment in which participants as a group, exchange ideas, participate in discussions and interact socially. Asynchronous communication occurs when interaction between parties does not take place at the same time. One party composes and sends messages, course texts, information references and other learning resources without regard to when these materials are actually retrieved and used by another party. Electronic mail, news groups, bulletin boards and computer conferencing are examples of asynchronous communication. Print materials, learning and information resources stored on CD-ROM and applications like LearningSpace are other examples of asynchronous communication."

- The second field concerns research into group processes within these teams. How does the loss of physical aspects of communications (i.e. social cues) affect the group and its individual members? Can these teams develop the necessary relational links to reach a same level of social performance?

In both fields research is, as is the medium, relatively new. Both positive as negative outcomes has been found, but one of the overall outcomes is that CMC is a *promising technology* from which teams can benefit in relation to real face-to-face teams. Organizations using CMC-meetings have claimed that the computer has allowed tremendous increases in the productivity of meetings, according to Bulkeley (1992). Not only an increase in productivity, but also the quality can be improved by lessening of status distinctions. "A positive benefit of CMC is that participants differ less in the amount they participate in the exchange, possibly as the result of status distinctions being less noticeable. By contrast, in face-to-face meetings a few individuals (the boss, the older members) are likely to dominate the process" (Dipboye et al., 1994)."The lessening of status distinctions and the equalisation of participation could be a tremendous boon to the creativity of a group, but the anonymity responsible for these same factors also can create problems. The lack of nonverbal cues makes it more difficult for participants to determine how others feel about the issues under discussion. Consequently, individuals in CMC meetings take longer to reach agreement on issues and are less satisfied with the process" (Dipboye et al., 1994). This last finding summarises one of the major implications of CMC: the lack of social cues. Some studies indicate that virtual teams are less efficient than face-to-face teams (McGrath & Hollingshead, 1994; Hightower & Sayeed, 1995,1996). "Because exchanging information is more difficult, virtual teams tend to be more task oriented and exchange less emotional information, slowing the development of relational links" (Childambaram, 1996).

Development of relational links is important because "researchers have associated strong relational links with many positive outcomes including enhanced creativity and motivation, increased morale, better decisions and fewer process losses" (Walther & Burgoon, 1992).

One of the most well-known examples is the Challenger Space Shuttle disaster which primarily was caused by ignoring the warning of engineers concerning the dangers of launching the shuttle during bad weather. The warning was not properly handled and exchanged within the electronic communication network of NASA. "Some problems require a richer medium than provided by computers" (Daft en Lengels, 1984).

Despite these negative outcomes, researches have claimed that the lack of social presence and social cues can also be beneficial to the effectiveness of virtual teams. The strong task orientedness appears to increase, while workers that are not socially competent deliver a better production. It appears that the 'sociology of groups' mentioning that variables like status seeking and status incongruence have an impact of the effectiveness of groups, is less important in virtual teams than in face-to-face teams (cfr. Davies et al., 1998). Kiesler, Siegel en McGuire (1984) carried out several problem-solving experiments and conclude that "groups that used CMC took longer to reach consensus, participated more equally, showed more willingness to arrive at conclusions that differed from their initial proposals...". Sproull and Kiesler (1991) even go so far to suggest that "the use of email enables people who are peripheral in organisations to become more visible....electronic connections helps democratise

organisations by giving visibility to people who are often out of sight or ignored by people in more central or powerful positions."

The question raises to which extent it is possible for virtual teams to develop activities that directly are oriented towards the (social and individual) well-being of the group.

"A question that has been raised by some researchers relates to whether the limitations of CMC systems prevent groups from developing relational links as strong as face-to-face groups or whether the limitations simply increase the time it takes for these relational links to develop" (Chidambaram et al, 1996). These researchers argued that, with time, CMC groups will overcome the limitations of the media and achieve the same level of relational links and, therefore, the same level of performance as face-to-face groups.

A participant in an asynchronous meeting has more time to consider his or her message, decide what to say, take the time necessary to convey his or her thoughts, and edit the message as much as necessary to achieve clarity. The receiver of the message can read it at his or her leisure and consider it carefully before responding. This allows more time to include social-emotional information in the message in addition to the information required to accomplish the task (Warkentin et al., 1997).

These findings suggest that coaching of virtual teams can become an important issue in future research. With regard to coaching activities within virtual teams, there has not yet been done a fair amount of empirical research. However, interesting studies are conducted in the field of educational psychology where teaching and training activities in a CMC-environment and self-directed learning (developing student autonomy) are one of the research topics. Similar to virtual teams, coaching of students is realised through electronic support mechanisms like the 'intelligent tutor' (McManus, 1995). "[..] as students intellectually mature by acquiring critical thinking skills, participation in a community of self-directed learners is appropriate. CMC can facilitate this entire spectrum of learning development. However, such a transition of student learning can take place only when the teaching and learning styles of both faculty and students are transformed from information dissemination to critical inquiry and from instructor dominated to collaborative learning" (Seaton, 1993).

Jarvis (1995) mentions in fact 'leadership' and 'coaching' as the conditions to realise a socio-emotional climate in virtual teams, which is important for knowledge transfer. "Part of the intention of the teacher should be in trying to establish the climate where relationships are encouraged...it may be seen from this discussion that the manner through which teachers interact with learners is probably more important than the actual teaching methods employed".

Wilson en Whitelock (1998) stress, on the basis of longitudinal studies, the central characteristics of what an CMC-instructor should do to facilitate learning:: "the instructor needs to facilitate ease of access to needed technologies; create a sense of engagement; foster the sharing of information and promote individual gratification".

We were not able to present an *overall picture* of evaluation research into the effectiveness of virtual (versus face-to-face) teams. We only presented a few of the major findings that illustrates the social impact of CMC in virtual teams. Also there is some important critique uttered on the quality of mainstream CMC-evaluations. One critique is that experimental groups did not have enough time to adapt to the CMC-environment and another is that in these studies the dominant approach is (still) synchronic technology (Warkentin, Sayeed en Hightower, 1997).

3.4.4 Conclusions

- It is important to pay attention to media selection when evaluating (digitized) distance education and learning.
- The 'cultural acceptability' of media selected is important too for making DDE/DDL a success.
- Total Quality Management of (D)DE is possible: there are cases in which an overall Quality Management / Control program has been evaluated; that is also true for ISO-certification.
- DDE/DDL introduces a new way of interacting: computer mediated communication. Transfer of knowledge about face-to-face communication to CMC-settings is not a straightforward thing.

3.4.5 Recommendations

- Check the fitness of media for specific cultural settings.
- Attention must be paid to the validity and reliability of data used in a TQM process.
- It is recommended to set up monitoring activities for the interaction processes in CMC-settings.

4. Blind spots, forgotten variables, the importance of an evaluation infrastructure and promising directions

4.1 Blind spots & forgotten variables

The question we first answer is whether or not there are 'blind spots' and 'forgotten variables' when evaluating (digitized) distance education?

In our opinion there are blind spots/forgotten variables. We list them now and next say something about their relevance from a World Bank/EDI perspective.

- We did not come across evaluations that explicitly paid attention to reconstructing and assessing the underlying '*program logic*' of distance education activities and digitized ones in particular. The evaluations that referred to the 'cultural acceptability' of models and media for (D)DE came closest, but an explicit methodology used to reconstruct and assess these 'images' we did not find. The same is true regarding articulating and assessing underlying '*pedagogical scenarios*', '*learning or instructional models*'. Though they are considered important, we hardly did run into empirical studies assessing the 'quality' (ie. correctness, robustness, parsimoniousness and validity) of these models. Reconstructing and assessing the underlying program or pedagogical logic is important because it gives the evaluator (and the decision-maker) an insight into the (social and behavioral) *premises or mechanisms* that underlie activities. The US General Accounting Office calls this the "construction of underlying models of (proposed) programs" (GAO, 1991: 22) and distinguishes between conceptual and operational reconstruction. A conceptual reconstruction concerns the social and behavioral *logic* behind the program, an operational reconstruction focuses on *why which* actors are assumed to *do what* in order to make the program a success. Leeuw (1991:74) refers to the concept of a policy theory, which is a "system of social and behavioral assumptions that underlie a public policy which have been reformulated in the form of *premises* (or propositions). These premises reflect beliefs of policy makers about the cognition, attitudes and behaviors of the policy's target groups (...) But they also refer to more structural factors on which policy makers have been making assumptions". He goes on to show that "there is evidence that knowledge about the content of [policy] theories helps us to understand why policies sometimes turn into failures or disasters" (Vedung, 1998). In particular, reconstructing and assessing the underlying logic of an [activity] is important for obtaining information about the future *opportunities* for program activities. The more sound the premises on which an activity is based, the greater the chance that the activities will succeed.
- Earlier we referred to McNeil (1998) who summarized attitudes of leading educators regarding the Internet as a tool of (distance) education. She referred to very positive aspects but also to the butterfly-defect. Given these apparent differences in values attached to Internet, articulating and evaluating social, cognitive and behavioral assumptions underlying the Internet as an education tool, is strongly recommended.

- Information on the *impact* (D)DE evaluations have had on decision-makers, teachers and trainers is hard to find. *Utilization of evaluation findings* is not often addressed, as is the case with regard to the possibilities of single or double loop learning resulting from evaluations. We consider that a second major blind spot.
- Though ICT opens up new ways for *data-collection*, we did not come across many studies making use of these possibilities.
- Acknowledging the importance attached to *networking and 'partnering'*, the attention paid to these variables still is limited. In the evaluations we referred to, a *traditional* approach to networks is used which focuses on institutional collaboration. We did not run into studies in which networks were empirically charted (over time), nor did we find studies which answer the question how networks can be 'managed'. Information on types of networks, on the importance of mechanisms like 'trust', 'social capital' and 'commitment' within networks is lacking too. It is the overarching mechanism of social capital that makes networks 'work'. In order to understand and assess how this mechanism works, it is necessary to look into this phenomenon more carefully. While the methodology of collecting social capital data and charting networks has expanded rapidly over the last 15 years¹⁸, it looks like as if this development has not been acknowledged by the community of evaluators in the field of DDL. In our opinion this again is an important blind spot.
- Several cases were mentioned where maybe due to political or economic reasons ('competition'), *valid and reliable data* that are needed for a.o. cost-benefit analysis, did not exist.
- There are only a few evaluations of *short term teaching and training programs*; most of the evaluations looked into programs with a focus on credits and (academic) degrees. Given the focus of the World Bank /EDI on primarily these types of DDE/DDL, this also is an important blind spot in the existing research.
- The overall *quality of evaluations* in digitized distance education and learning can be questioned:
 - Evaluation is mostly a side activity of the overall training or learning activity
 - The evaluations are often 'academic' exercises that are not a 'natural' part of the 'digitilization' initiative.
 - Techniques used are restricted and due to methodological shortcomings (lack of control, inferences, sampling errors) restricted to descriptive statistics and analysis
 - Most evaluations are not a recurrent activity in the set-up and control of the initiative. Most evaluations remain single-shot attempts.

4.2 Evaluation infrastructure/evaluation capacity building

¹⁸ Ucinet (IV) methodology and Krackplot-charting programs are widely used elsewhere (Bulder et al, 1996; Noria & Eccles, 1995; Flap, Bulder and Volker, 1998).

Given these 'blind spots' and 'forgotten variables', an 'evaluation infrastructure' or 'evaluation capability' when assessing digitized distance education activities is important.

We therefore describe what is meant by these concepts and why it is believed such an infrastructure is important. Finally we shortly address the question in which organizations such an infrastructure should be built into referring DDL.

Evaluation capacity (building) focuses on ways and (institutional) arrangements that safeguard evaluations:

- to be carried out and reported 'just in time';
- to be carried out according to state-of-the-art theoretical and methodological standards (i.e. including a focus on reconstructing and assessing underlying program logics and pedagogical models);
- to be carried by qualified personnel;
- to be managed properly;
- to have enough funds for independent data-collection and analysis;
- to be carried out with a focus on utilization and (organisational) learning;;
- to be carried out in a transparent and 'accountable' way;
- to have a focus on variables that are relevant for decision-makers;
- to be carried out systematically in stead of ad hoc.

When organizations (or countries) have an 'evaluation infrastructure' developed along these lines, their 'evaluation capacity' is realized. Evaluation Capacity Building or ECB is considered important by the World Bank, by many audit offices, by professional evaluators and their societies and, last but not least, by agencies focusing on sound financial management and budgeting (Ministries of Finance, internal and external audit offices) (McCKay, 1998). McCKay (1998: 11 ff) lists the following success factors¹⁹:

- One success factor is the existence of a 'champion agency' in supporting, encouraging and pushing the development of an evaluation system;
- Sustained commitment is also important. 'An evaluation system cannot be developed overnight' (MaCkay, 1998: 11).
- A tailor made rather than a one-size-fits-all approach is also crucial for the development of an evaluation infrastructure;
- 'The final lesson is that incentives are crucial to ensuring both that an evaluation system is developed and that evaluation findings are actually used (ibidem:12).

Within the field of (D)DL, there are several -in particular- Open or Distance Universities that indeed have an evaluation infrastructure developed and implemented. One major reason is that these institutions were established in a time where evaluation and auditing were on the agenda, while classic universities in general are much older. Secondly, there has been (and is) an almost natural drive for distance education institutes to collect evaluation data because they usually do not have students and clients 'walking around on their premises', making it possible for

¹⁹ There are also negative (side)effects reported in the literature when there is 'too much' of an evaluation infrastructure. Examples are 'analysis paralysis', manualization (everything has to be evaluated primarily for the sake of the evaluator and according to 'manuals') and the performance paradox (organizations that monitor and evaluate are not necessarily the most efficient and effective organizations). See Leeuw (1996; 1998) for a discussion.

decision-makers (and teachers, tutors, instructors or professors) to claim and assume that just by walking and talking around abundant 'evaluation data' are available.

Together with our assessment of the evaluation research in terms of blind spots and 'forgotten variables' we therefore strongly advise EDI/World Bank to invest in the development of an evaluation infrastructure in countries and organizations they work with. EDI's evaluation unit and the Bank's Operations Evaluations Department can serve as examples. If organizations working in the field of digital distance education are too small for developing an evaluation infrastructure on their own, we recommend to have 'evaluation brokers' available who can help in realizing to scale up the activities between different (smaller) organizations.

4.3 Promising directions

We believe that the following activities are promising.

- Performance monitoring using the extra facilities that are offered by digital developments to data-collection & analysis.
Rationale: much more faster feedback from decision-makers, other users and the general public on pro's and con's of performance data are possible. This may even help to reduce the phenomenon of the Performance Paradox (i.e. performance indicators no longer measuring 'real performance').
- Enhancing knowledge about the impacts of computer-mediated communication.
Rationale: The potential of computer mediated communication opens new ways to involve a large and varying number of stakeholders in the evaluation process. Next to building upon the information one might obtain through direct (synchronous or a-synchronous) interaction, there are extra possibilities, such as background monitoring and logging of data-usage and interaction patterns. CMC-systems can document who got in touch with who, what kind of data were consulted by whom, what kind of data are never consulted, at what time is interaction high and/or low, which individuals/groups are always involved in the activities (creaming) or hardly ever (social marginalization), to what extent is the performance of the infrastructure optimal (peak usage, system failures) etc.
But, next to that, data obtained from direct computer mediated interaction are promising also because:
 - the interactions are always documented and retrievable;
 - evaluative reflections can be interwoven into the CMC-activities and analysed separately.
- The development of a 'system level type of evaluation'.
Rationale: We found some interesting examples of situations where a *systems approach* towards evaluation has been adopted. Here evaluators were considering to map the *full complexity* of the DDL-settings: the variety of stakeholders, the interrelations with cultural and socio-economical parameters, the number of variables playing a role and the fact that sometimes a long-term

view on the processes and their societal impact was acknowledged. Such a systems approach is clearly in line with the “evaluation capacity building” we discussed above.

5. Putting things together: final conclusions

This section brings together the major conclusions and recommendations presented earlier in this report.

Internal evaluation studies based on the analysis of performance

Conclusions	Recommendations
<ul style="list-style-type: none"> • In the evaluation literature on DE attention is paid to the opportunities information and communication technology (ICT) can have for data-collection. • Performance indicators assessing distance education activities are developed and available. They can reveal interesting findings (eg on the difference in coverage level of DE between geographic areas). • It is important to take notice that DE performance indicators can be culturally 'incorrect'. • Performance indicators specifically focused on digitized DE we did not come across in the research literature. 	<ul style="list-style-type: none"> • When establishing DDE/DDL-initiatives, we recommend to develop specific performance indicators when ICT is a central characteristic of DE activities. • We also recommend to assess what in practice has been done with information resulting from performance indicators. To what extent have DE programmes indeed been modified, due to this type of information?.

Internal evaluation monitoring attitudes and perceptions as well as staff (quality)

Conclusions	Recommendations
<ul style="list-style-type: none"> • Quality of the staff is being evaluated, both qualitatively and quantitatively. • The ways in which staff is trained are also being evaluated. • In the research literature there are many examples of empirical studies into perceptions, opinions and cognitions of students/clients regarding forms and cases of distance education. • With regard to attitudes and perceptions of students/clients regarding Digitized distance education, it appears that when digitization is not part of a more integral, holistic approach to distance education, the attitudes are not very positive. 	<p>We recommend that DDE/DDL-initiatives should:</p> <ul style="list-style-type: none"> • monitor the knowledge students /clients have about particular provisions in the DDE/DDL-setting; • monitor the level of integration of the different delivery media used in the setting; • check the relative importance students attach to different delivery media. <p>With regard to the variable 'staff', the findings suggest:</p> <ul style="list-style-type: none"> • to follow a multitude of paths to develop the skills required in staff development; • to focus both upon projects at the short and long term.

External evaluation studies

Conclusions	Recommendations
<ul style="list-style-type: none"> • The socio-cultural environment, both on the local as on the national level should be taken into account when performing evaluations; • that is also true for the embeddedness of DDE/DDL initiatives into the workplace, regional centers, community centers and the home; • with regard to cost-benefit analysis, the assumption that relatively large numbers of these analyses with a focus on DDE/DDL were available, did not come true; • there appears to be a certain reluctance in carrying out this type of evaluations, because stakeholders consider digitization a specific asset in competing other organizations, which may make it difficult to have 'objective' data on costs and benefits of digitization available; • however, cost-benefit analyses that have looked into Digitizid DE are in general positive about this approach; • with regard to feasibility evaluations, we found some examples making use of a multi-method approach; • networks and partnerships are important for developing DDE/DDL and they are looked into in several evaluations; • again it turns out that the 'import' of DDE/DDL models from developed countries into developing countries is critically received. 	<p>Recommendations with regard to the variable '<i>environment</i>':</p> <ul style="list-style-type: none"> • Check whether the environment of a DDE/DDL-project offers opportunities to share resources; such as libraries, community centers, the workplace; • look for partners that help to strengthen DDE/DDL-initiatives; • analyze what (existing) communication channels and approaches are available to spread interest in the DDE/DDL-initiative; • set up research to define "appropriate technologies" for developing countries; • check whether capacity building is also necessary in the environment of the project <p>Recommendations with regard to <i>cost-benefit analysis</i></p> <ul style="list-style-type: none"> • Define non-financial costs and benefits to be incorporated in the analysis (performance driven benefits, like learning outcomes, level of satisfaction), value driven benefits (access, flexibility, ease of use) and societal or value-added benefits (e.g. reduce pollution); • have an answer ready to the question to what extent the variables in a cost-benefit analysis are derived from the specific DDE/DDL-setting in a developing country? • Is the analysis based on data from a sufficiently long period? • Focus on the perspective of different stake holders when calculating costs and benefits. • Has there been an objective check on the calculation models used? <p>Recommendations with regard to <i>network/network analysis</i></p> <p>The list of studies reviewed helps us to extract the following recommendations/guidelines:</p> <ul style="list-style-type: none"> • Delineate for what parts of a

	<p>DDE/DDL-initiative partnership is to be preferred; e.g., for design and development of a program but not for the actual exploitation;</p> <ul style="list-style-type: none">• Involve specific partners with specific expertise;• Consider differences between (national and international) partners in a partnership; e.g. cultural, economic, pedagogical, administrative and technological differences;• Be aware of project features which might be interpreted as neo-colonialism.
--	--

Evaluation studies in which a stakeholder approach is used

Conclusions	Recommendations
<ul style="list-style-type: none"> • The stakeholder perspective is important, as was shown in the Hungarian study related to employers' impact on the success of DDE/DDL; • with regard to datacollection it is important to pay attention to the possibility that stakeholders hold opinions, attitudes and cognitions about ICT / DDE/DDL while they themselves did not have any <i>hands-on-experience</i>. Although the Hypothetical Question Methodology is useful in interviewing stakeholders, this artefact must be looked after. 	<ul style="list-style-type: none"> • Identify the stakeholders at a variety of levels (target audience, institution, institutional network, national and international) and along a variety of dimensions (educational, economical, societal/cultural); • Identify the congruencies and/or conflicts in the interests of the stakeholders and discuss them beforehand. Check the level of flexibility in the project to deal with the differing interests of stakeholders/partners. • Monitor the involvement of stakeholders. Consider this as a research/evaluation question in the DDE/DDL-initiative. • Considering the availability of a list of stakeholders, importance issues to check are: <ul style="list-style-type: none"> • to state whether distance education would be a satisfying mode • to determine who the primary audience should be for a DDE/DDL-initiative • to determine what the specific needs are of the target groups identified • to identify didactic methods that are in line with the target groups • to detect expectations of the target group about the services that will be provided • to know expectations of the target group about the technologies that will be used.

Other approaches and methods: media selection and media usage in (D)DE; TQM) and ISO-certification; studies focusing on CMC

Conclusions	Recommendations
<ul style="list-style-type: none"> • It is important to pay attention to media selection when evaluating (D)DE. • The ‘cultural acceptability’ of media selected is important too for making DDE/DDL a success. • Total Quality Management of (D)DE is possible: there are cases in which an overall Quality Management / Control program has been evaluated; that is also true for ISO-certification. • DDE/DDL introduces a new way of interacting: computer mediated communication (CMC). Transfer of knowledge about face-to-face communication to CMC-settings is not a straightforward thing. 	<ul style="list-style-type: none"> • Check the selection fitness of media or specific cultural settings. • Attention must be paid to the validity and reliability of data used in a TQM process. • It is recommended to set up monitoring and coaching activities for the interaction processes in CMC-settings.

6. References

- Abdullah, S. (1997). The implication of learner-centered approach to distance education provision: A Malaysian experience. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y3abdullah
- Abrami, P., C., & Bures, E. M. (1996). Computer-supported collaborative learning and distance education. *The American Journal of Distance Education*, 10(2), 37-42.
- Aderinoye, R.A., (1997). Human resource development for effective management of distance education in Nigeria the need for intervention. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y4aderin
- Agrawai, A.M. (1997). Distance education in India & role of industries. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B4agrawa
- Anand, V.K. (1997). Future distance education libraries in India: a symbiosis of Modern technology and resource sharing. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R10anand.
- Ansari, M.M. (1994). Economics of distance education in India. In Dhanarajan, G., Ip, P.K., Yuen, K.S. & Swalers, C. (eds.). *Economics of distance education: Recent experience*. Hong Kong: Open Learning Institute Press, pp. 74-87.
Association for Learning Technology journal, 4, 1, 58-68.
- Bahack, H. (1997). Students' Study Habits And Their Attitudes Towards Interactive Distance-Education Courses. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R3bahack.
- Bartolic, S. (1998). Assessing the costs and benefits of telelearning. In Proceedings CADE/ACED conference 1998, *Partners in Learning*. Athabasca: Athabasca University, pp. 26-28.
- Bates, T. (1995). *Technology, Open Learning and Distance Education*. London & New York: Routledge.
- Bility, K. & Odharo, J. (1997). Improving primary health care services through distance and nursing education in Botswana. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R4bility.

Bottomley, J. & Calvert, J. (1995). Estimating the benefits of higher and distance education programmes. in Dhanarajan, G., Ip, P., Yuen, K. & Swales, C. (1995). *Economics of Distance Education - Recent experience*. Hong Kong: Open Learning Institute Press, pp. 88-116.

Bregar, L. and Zagnajster, M. (1996), Development of a Distance Education
Brody, C. M. (1995). Collaborative or cooperative learning? Complementary [sic] practices for instructional reform. *Journal of Staff, Program, & Organizational Development*, 12, 133-143.

Bulder, B., F. Leeuw & H. Flap, Networks and evaluating public sector reforms. *Evaluation, The International Journal of Theory, Research and Practice*, 2 (3), 1996: 261-276.

Bulkeley, 1992. FOUT. MOET ZIJN: Warkentin, M.E, Sayeed, L en R. Hightower (1997). Virtual Teams versus Face-to-Face Teams: An Exploratory Study of a Web-based Conference System. *Decision Sciences*. volume 28, Number 4, Fall 1997.

Burge, E., J. (1994). Learning in computer conferenced contexts: The learners' perspective. *Journal of Distance Education*, 9(1), 19-43.

Calder J. (1997). Deliberate change in adults and the use of media-based learning materials. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y6calder.

Calder, J. (1994). *Programme evaluation and quality- A comprehensive guide to setting up an evaluation system*. Open and Distance Learning Series. London: Kogan Page.

Calder, J. (1995). Evaluation and self-improving systems. In F. Lockwood (ed.) *Open and Distance Learning today*. London & New York: Routledge, pp. 354-360.

Chacon, F. 1997). Distance education in latin america: growth and maturity. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B4chacon

Challapalli, S. (1997). Open universities in India: expectations and experiences. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y4challa.

Childambaram, L. (1996) Relational development in computer-supported groups. *MIS Quarterly*, 20(2), 143-163.

Childambaram, L. (1996) Relational development in computer-supported groups. *MIS Quarterly*, 20(2), 143-163.

Daft, R.L. en Lengel, R.H. (1986) Organizational information requirements, media richness and structural design. *Management Science*, 32(5), 554-571.

Davies, R. (1998). Telecommuting: culture, social roles, and managing telecommuters. Introduction Internet Conference "Telecommuting and employee effectiveness", April-October 1995. MCB University Press.
Decision Sciences. volume 28, Number 4, Fall 1997.

Dede, C. (1996). The evolution of distance education: Emerging technologies and distributed learning. *The American Journal of Distance Education*, 10(2), 4-36.
Dhanarajan, G., Ip, P., Yuen, K. & Swales, C. (1995). *Economics of Distance Education - Recent experience*. Hong Kong: Open Learning Institute Press.

Dipboye, R., Smith, C.S. and W.C. Howell (1994). Understanding Industrial psychology. An Integrated Approach. NY, Harcourt Brace College Publishers.
Distance Education Systems in Central and Eastern Europe, Guidelines, EADTU.

Education.AU (1997). *Models for Evaluating Open Learning Approaches and Associated Technologies An Bibliography of Relevant Literature*.
<http://www.educationau.edu.au/archives/models/intro.htm>

Education.AU (1997). *Open learning technology decision instrument. An instrument for basing technology decisions in the provision of open and flexible learning*.
<http://www.oltc.edu.au>.

Faria, D., Garcia, L., Casey, T., Farrell, R. & Kinniard, K. (1997). The Brazilian EAC&T model of distance education for teachers. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B4faria

Farnes, N., Woodley, A. & Környei, I. (1994) How distance learning assists in the transition towards a market economy: human resource development in Hungary. In Proceedings of the European Distance Education Network (EDEN) conference, Tallinn, Estonia: EDEN, pp.105-116.

Flagg, B. (1990) *Formative Evaluation for Educational Technologies*. Hillsdale: Lawrence Erlbaum Associates.

Fulzele, T.U. (1997). Impact of emerging technologies on distance education. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B2Fulzel.

GAO (US General Accounting Office) (1991). *Designing evaluations*, Program Evaluation & Methodology Division, Washington DC.

Gayol, Y. & Schied, F.M. (1997). Cultural imperialism in the virtual classroom: critical pedagogy in transnational distance education. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file G6schied

Georgiev, K., Naumov, V., Panov, E. & Patev, H. (1998). Necessity and possibilities for innovations in Bulgarian education, connected with the development of the Varna's region. In A. Szücs & A. Wagner (eds.). *Universities in a digital Era. Transformation, innovation and Tradition*. Budapest: EDEN (www.eden.bme.hu), pp.84-87.

Griffith, K.A., (1997). Developing the Social Applications of Satellite Capacity in Latin America. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y2griffi.

Harasim, L. (1987). Teaching and learning online: Issues in computer-mediated graduate courses. *Canadian Journal of Educational Communication*, 16(2), 117-135.

Harasim, L. (1990). Online education: An environment for collaboration and intellectual amplification. In L. M. Harasim (Ed.), *Online education: Perspectives on a new environment*. New York: Preager Publishers.

Hightower R. & Sayeed, L., (1997) MOET ZIJN: Warkentin, M.E, Sayeed, L. en R. Hightower (1997). Virtual Teams versus Face-to-Face Teams: An Exploratory Study of a Web-based Conference System. *Decision Sciences*. volume 28, Number 4, Fall 1997.

Hodes, C. (1997). Technology considerations in distance education: a journey from print to modem. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B10Hodes. <http://www.oltc.edu.au/report/cons4/index.htm>.

Jarvis, P. (1995). Teachers and learners in adult education: Transaction or moral interaction? *Studies in the Education of Adults*, 27(1), 24-35.

Jegede, O. (1997). On-line evaluation of distance education. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y3jegede.

Jewett, F. (1997). Case studies in calculating the benefits, costs and of mediated instruction and distributed learning. http://www.calstate.edu/special_projects/mediated_instr/SLIDES/index.htm.

Jha, J. (1997). Application of digital multimedia technology in Distance education. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R2jha.

Kamau, J., W. (1997). Post Literacy Programmes in Crisis: The Kenya Case. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y4kamau.

Kane, E. Participatory research for girls' education: a manual to be used with groundwork: the Video, EDI Working Paper/Video, Washington DC, 1996

Keegan, D., 1990. 'Open learning: concepts and costs, successes and failures' in *Open Learning and New Technology*, ed. R. Atkinson & C. McBeath. Conference Proceedings, Australian Society for Educational Technology. WA Chapter, Curtin University, Perth, June, pp 230–243.

Kemmis, S. (1980) *Program Evaluation in Distance Education: Against the Technologisation of Reason*. Open Campus. Geelong: Deakin University, Center for Educational Services. pp 19-48.

Kess, P. & Pyykönen, T (1998). Quality in complex learning environments. In A. Szücs & A. Wagner (eds.). *Universities in a digital Era. Transformation, innovation and Tradition*. Budapest: EDEN (www.eden.bme.hu), pp.557-561.

Kiesler, S., Siegel, J. en T.W. McGuire (1984). Social Psychological Aspects of Computer-Mediated Communication. *American Psychologist*. Volume 39, Nr.10, 1123-1134.

Kirkwood, A. & Ismail, N (1995). Personal computing: transferring the cost of learning at home. in Dhanarajan, G., Ip, P., Yuen, K. & Swales, C. (1995). *Economics of Distance Education - Recent experience*. Hong Kong: Open Learning Institute Press, pp. 228-240.

Kirschner, P. & Valcke, M. (1994). From supply driven to demand driven education: New conceptions and the role of information technology therein. *Computers in Human Services*, 10(4), 31-53.

Kishor, N & Saxena, K. (1997). Evaluation of distance learning institutions : a quest for quality. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y3kishor.

Klimowicz, G. (1998). The client-oriented distance education: wide spectrum of educational needs of various social groups. Results of studies. In A. Szücs & A. Wagner (eds.). *Universities in a digital Era. Transformation, innovation and Tradition*. Budapest: EDEN (www.eden.bme.hu), pp.30-37.

Kumar, K. & Madhumita, (1997). Faculty development through video teleteaching. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R2madhumita.

Landstrom, M., Denis Mayer, D., & Shobe, C.(1997). Indicators to measure performance in distance education, a double-edged sword. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y5landst.

Lee, W. (1994) University Accreditation in Korea, In Alma Craft (ed.). *International Developments in Assuring Quality in Higher Education*. London: Falmer.

Leeuw, Frans L. & Ger H.C. van Gils, EDI's anticorruption initiatives in Uganda and Tanzania: a midterm evaluation, EDI- Evaluation Studies, Washington DC, 1998.

Leeuw, Frans L. Auditing and evaluation: bridging a gap, worlds to meet?, in: Carl Wisler (Ed.), *Evaluation and Auditing: prospects for convergence*, New Directions for Evaluation # 71, Jossey-Bass Publishers, San Francisco, 1996: 51-61.

Leeuw, Frans L. Comments in: R.MacKay (ed.), *Public sector performance: the critical role of evaluation*. Selected proceedings from a World Bank Seminar, Washington DC, 1998:76-78

Leeuw, Frans L. Performance auditing, new public management and performance improvement: questions and answers, in: *Accounting, Auditing and Accountability Journal*, 9, 2 (1996): 92-102

Leeuw, Frans L. Policy theories, knowledge utilization, and evaluation, in: *Knowledge and Policy*, 4 (1991): 73-92.

Mac Keogh, K. (1998). Open distance learning policy in Europe - lessons from the SOCRATES ODL action 1995-1997. In A. Szücs & A. Wagner (eds.). *Universities in a digital Era. Transformation, innovation and Tradition*. Budapest: EDEN (www.eden.bme.hu), pp.14-18.

Madan, V.D., (1997). Systemic research and performance indicators in Open and Distance Learning. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y3madan.

Maimela, S.S. (1997). Quality assurance strategies at the university of South Africa. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file G5maimel.

Mason, R. (1992). Methodologies for Evaluating Applications of Computer Conferencing. PLUM Paper No. 31. The Institute of Educational Technology, The Open University, UK.

Mason, R. (1994). *Using communications media in open and flexible learning*. London: Kogan.

Mason, R. (1995). Evaluating technology-based learning. In B. Collies & G. Davies (eds.). *Innovating adult learning with innovative technologies*. Amsterdam: Elsevier.

Mason, R. (1998). *Globalising education*. London: Routledge.

Mayer, D. & Roy, S. (1997). Expanding distance education in Western China. . In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file G2Mayer

McGrath, J.E. & Hollingshead A.B.(1994). *Groups interacting with technology: Ideas, evidence, issues and agenda*. London, Sage.

McKay, R. (ed.), *Public sector performance: the critical role of evaluation*. Selected proceedings from a World Bank Seminar, Washington DC, 1998:76-78

McManus, M and R.M. Aiken. Using an Intelligent Tutor to facilitate collaborative learning. In: Collis, B. and Davies, G. (1995) Innovative adult learning with innovative technologies. Elsevier Science.

McNair, S. (1997). Lifelong learning and technology in OECD-countries. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y5mcnair.

McNeil, Mary, The INTERNET: a plus or minus for the next century, in: EDI- Forum, 3 (1), 1998: 9-12.

McWilliams, P. & Khan, A. (1997). Diffusion of appropriate educational technology in open and distance learning in developing commonwealth countries: a research project. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B3Mcwill.

Mohaiadin, J. (1997). Compressed Video Conferencing (CVT) for Distance Learning: Science University of Malaysia Experience. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R4Mohaiadin.

Moore, M. G. (1990). Background and overview of contemporary American Distance Education. In M. G. Moore (Ed.), *Contemporary issues in American Distance Education* (pp. xii-xxvi). New York: Pergamon Press.

Moson, P. (1998). Quality Issues in Hungarian Distance Education. In A. Szücs & A. Wagner (eds.). *Universities in a digital Era. Transformation, innovation and Tradition*. Budapest: EDEN (www.eden.bme.hu), pp.568-570.

Nhundu, (1997). Three years of University Distance Education in Zimbabwe: progress, challenges and future prospects. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B4nhundu

Nitikasetsoontorn, P. (1997) The use of integration in distance learning courses. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R2nitika.

Nonyongo, E.P. (1997). Collaboration in the professional development courses for distance education practitioners: a South African case study. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file G8nonyon.

Nti, N.O. (1997). Making distance education work across international boundaries: some strategies. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file G8nti
Open Learning Technology Corporation Limited (1997). *Open learning technology decision instrument. An instrument for basing technology decisions in the provision of open and flexible learning*.

Panko, R.R. (1992). Patterns of managerial communication. *Journal of Organizational Computing*, 2(1), 95-122.

Pérez, L.G. (1997). Towards the constitution of the first virtual university in Mexico. Is a new educational paradigm being followed at the Instituto Tecnológico y de Estudios Superiores de Monterrey? In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file G5galarz

Petkoski, D. Learning together with clients, EDI Working Paper, Washington DC, 1998 Programme at the Faculty of Economics, University of Ljubljana in : Developing

Ramanujam, P.R. (1997). Distance education in the 21st century: implications for the developing countries. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y4ramanu

Rao, K. (1998). Between the intention and the act lies the shadow: technologies in distance education. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R4Rao.

Ross, P. (1997). The university of the future: learning from 15 years of distance education. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y5paul.

Rossi, Peter H. & Freeman, Howard S. (1993), *Evaluation; a systematic approach*, Newbury Park, Sage.

Roy, J. (1997). , We access the world, but the world invades us.: an assessment of the impact of globalisation and new learning in the Malaysian context. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file G8roy.

Seaton, W. J. (1993). Computer mediated communication and student self-directed learning. *Open Learning*, 8(2), 49-54.

Shahabudin, S. (1997). Intersectoral collaboration in distance education: the family medicine program at University Kbangsaan Malaysia. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y5shahab

Shultz, T., Kurtz, G., Friedman, B. & Alberton, Y. (1997). The Use of Technology to Evaluate the Technology: Theoretical and practical implications. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R3schultz.

Silong, A.D. (1997). Strategic partnership and alliances in delivering distance Education in Malaysia. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R5silong.

Sonnichsen, Richard, Effective internal evaluation: an approach to organizational learning, in: Frans L.Leeuw, Ray C.Rist & R.C.Sonnichsen (eds.) Can governments learn? Transaction Publishers, New Brunswick & London, 1994, chapter 6.

Sproull, Lee and Sara Kiesler. 1991b. Connections:New Ways of Working in > the Networked Organization. Cambridge: MIT Press.

Sungsri, S. (1997).Distance education for elderly people in Thailand. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B2sungsri

Tahir, G. & Umar, A. (1998). Open broadcasting and the dilemma of education when training of nomadic pastoralists in Nigeria. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R4tahir.

Takwale, R. (1997). New paradigm of higher education for sustainable development. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B2takwal.

Taschereau, S. (1998). *Evaluating the impact of training and institutional development programs; a collaborative approach*. Washington DC: EDI.

Teswanich, J. (1994). Educational investment in distance education: inequality that needs to be changed. In Dhanarajan, G., Ip, P.K., Yuen, K.S. & Swalers, C. (eds.). *Economics of distance education: Recent experience*. Hong Kong: Open Learning Institute Press, pp. 42-57.

Thomas, V. The power of learning, in: Annual Report EDI, The World Bank, Washington DC, 1996.

Thorne, E. (1997). How transferable is distance education? The experience of the UK Open University in the former Soviet Union. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM fileB4thorne

Thorpe, M. (1988). *Evaluating Open & Distance Learning*. Harlow/Essex: Longman.

Twining, J. & Davies, K. (1998). The ODL Quality Development Guide, xxxx referenties aanvullen

Uppalapati, S.R. (1997). The changing technological environment in developing countries. A case study of dr. B.R. Ambedkar Open University. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R2uppalati.

Upreti, P. Youngblood, P. & Rotem, A. (1997). A Study of the Impact of Learner Interaction with tutors and fellow students on Learning Achievement in a Distance Education (DE) Program for Continuing Nursing Education (CNE) in Nepal. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file G3upreti

- Veena, S. & Phalachandra, B. (1997). Primary teachers training through interactive television - an Indian experience. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B1phalac
- Victor, L. (1997). A learner support system for marginalised learners in distance education. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y10victo
- Vunnam, V. (1997). Application of new technologies in distance education. A case study of dr.B.R.Ambedkar Open University. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R4Vunnam.
- Walther, J.B. and Burgoon, J.K. (1992). Relational communication in computer-mediated interaction. *Human Communication Research*, 19(1), 50-88.
- Wang, Ch-Y., (1997). Community cable television - an emerging distance learning resource for adults in Taiwan. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B4Wang
- Warkentin et al., 1997 MOET ZIJN: Warkentin, M.E, Sayeed, L en R. Hightower (1997). Virtual Teams versus Face-to-Face Teams: An Exploratory Study of a Web-based Conference System. *Decision Sciences*. Volume 28, Number 4, Fall 1997.
- Warkentin, M.E, Sayeed, L en R. Hightower (1997). Virtual Teams versus Face-to-Face Teams: An Exploratory Study of a Web-based Conference System.
- Wilson, T & D. Whitelock (1996). Piloting a new approach: making use of new technology to present a distance learning computer science course.
- Wilson, T., & Whitelock, D. (1988). Monitoring the on-line behaviour of distance learning students. *Journal of Computer Assisted Learning*, 14, 91-99.
- Wu, W-C. (1997). The application of Distance Education offered to retired people in Taiwan. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file B10Wu
- Xingfu, D. (1994). Economic analysis of radio and TV universities in China. In Dhanarajan, G., Ip, P.K., Yuen, K.S. & Swalers, C. (eds.). *Economics of distance education: Recent experience*. Hong Kong: Open Learning Institute Press, pp. 157-170.
- Yenbamrung, P. (1995). The emerging electronic university: a study of student cost effectiveness. in Dhanarajan, G., Ip, P., Yuen, K. & Swales, C. (1995). *Economics of Distance Education - Recent experience*. Hong Kong: Open Learning Institute Press, pp. 213-227.

Zagmajster, M. & Bregar, L. (1997). A comparative evaluation of students' opinions of distance education courses. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file Y3zagmaj.

Zárda S. (1998). How to apply the ISO 9001 in the open and distance learning services? In A. Szücs & A. Wagner (eds.). *Universities in a digital Era. Transformation, innovation and Tradition*. Budapest: EDEN (www.eden.bme.hu), pp.562-567

Zhenfang, W. (1997). The structure of a local tv university in China - its present situation and problems. In ICDE (ed.). *The New Learning Environment - A global Perspective*. Penn State: Penn State University. CD-ROM file R5wang.

7. Appendix 1: Calculation model

University of British Columbia

Course “Develop, design & delivery of technology based distributed learning (course code EDST 565f)”, 13 week course, involving 40 students.

Variable costs

Fixed costs	Course design/setup:	In Can\$
	<ul style="list-style-type: none"> • staff time (50 hrs) • travel 	2,262.29 311.67
	Development	15,993.37
	Marketing	3,709.80
	Copyright clearance	700.00
	Overhead to university	2,585.70
	Overhead to own division	9,131.97
	Library	1,000.00
	Server costs	300.00
	International tutors	2,000.00
	Faculty of Education Academic Approval	4,000.00
	Video conferences	1,544.50
	2 nd phone hook up & fees (6 months)	225.90
	miscellaneous	305.94
	<i>Total fixed costs</i>	\$44,071.14
Variable Costs (depending on the number of students, here N=40)	Instructional time	16,344.28
	Administration/registration	12,365.08
	Printed materials	1,500.00
	<i>Total variable costs</i>	30,209.36
Total Costs of On-Line version		\$74,280.50
Revenue (student fees)		\$43,980.04
Total costs if set up in a face-to-face setting		\$96,000.00

8. Appendix 2: Technology decision instrument

Table Fout! Onbekende schakeloptie-instructie.: Functional Model - Open Learning / Communications / Media—Examples

Source Open Learning Technology Corporation Limited (1997, p.14)

Decision Sequence	Decision Sequence #	Decision Sequence #	Decision Sequence #	Decision Sequence #	Decision Sequence #	Decision Sequence #	Decision Sequence #	C = Cost B = Benefit V = Value		
Type	(i) Purpose & Curriculum	(ii)a Content Instructional Design	(ii)b Media Packaging	(iii) Primary Delivery Technology	(iv)a Delivery Platform	(iv)b Peripherals	(v)a Usability	(v)b Application		
								C	B	V
A1 Broadcast TV	Large number Wide dispersion	Entry level courses Visually based eg Art, History	Video Studio production	Broadcast television	TV set - home base	Nil	Familiar Reliable interface Fixed time			
A2 Broadcast TV + Added Value	Large number Wide dispersion	Add: Storyboard Tape segments Questions Some feedback	Studio production Tape editing Tape packages	TV + Training tapes	TV set Home Mail	Videotape recorder	Familiar Reliable interface Fixed time + Variable time . delay . replay			
B Multimedia Computing	Individualised instruction High visual High interactive	Integrated media/technology design Many specialists Broad content	Courseware Software Video	Digital Network (ISDN)	Computer PC or workstation	CD-ROM Compact Disc Video Board Communications Videodisc	Must be computer literate Complex technology			
C1 Print	Versatile coverage	Content structure Most instructional design components	Printing Binding	Printing process + Mail	Book Study guide	Good light Glasses! Learning Centres	Readability Very familiar Versatile in time/place			
C2 Print + Added Value	Verbal and sound	Structured sequence Replay Questions Guide	Audiotape Packages	Recorded tape	Audio player	Audiotape player/recorder (car)	Usable Very portable Reliable Stop and replay			

9. Appendix 3: Centers of Excellence

In reviewing the literature and exchanging information with experts, a number of institutions can be traced that function in such a way that could be designated as centers of excellence.

In this section we present a list of these centers, describe some projects and indicate key persons that can be contacted to obtain more specific information.

9.1 University of British Columbia - Centre for Distance Education, & Technology Continuing Studies

This center at the University of British Columbia, Canada, is known by the activities of its director Tony Bates (tbates@ubc.ca). He has been involved in a large number of international projects to start up DE- and DDE/DDI-institutions and/or projects. Part of his activities involve working in developing countries.

In this report we mentioned some of the projects, run by his institution, such as the on-line non-certificate program on distance education, offered world-wide with a Spanish-language version run by a Mexican partner.

9.2 Centre for Research and Development in Teacher Education, School of Education, The Open University, UK

Summary of recent research & project activities regarding ODL in teacher education/training in developing countries (based on info, provided by Jae-Eun, Joo, j.joo@open.ac.uk and prof. Moon, B. r.e.moon@open.ac.uk).

The Centre for Research and Development in Teacher Education (CRete) is the youngest centre in the School of Education at the Open University, UK. The centre was created around the teaching, research and teacher-development interests of the academics who were brought together in 1992 to design, write and implement the Open University Postgraduate Certificate in Education (OU PGCE). The OUPGCE is the largest open and distance learning initial teacher education course in Europe and is taught using the open learning techniques and a mix of different media such as text, video, audio, TV and ICT pioneered by The Open University.

One of the main research interests of the Centre is in Open and Distance Learning (ODL) and new technologies in teacher education. Specific projects to be mentioned are the following.

Project 1: The Enlaces Project, Chile

This interactive, multi-media pilot project is part of a series of projects developed in Santiago. Schools and teachers have been provided with the hardware to establish electronic communications locally and, in some instances, more widely through national and international collaboration. It illustrates the interrelationships that can be established between technological initiatives to improve school performance and the development of new models of teacher education.

The teachers working with the indigenous Mapuche Indians, who have no written language, are developing multi-media methods to record a sound dictionary in Apuche to keep the language alive. Electronic conferencing underpins this project. First reports point to the early success of the programme. Once the training was completed, 97 per cent of the participating teachers stated that they had developed a significantly more positive attitude toward computers; despite their need for considerably more practice in the use of the computers, 70 per cent of the teachers felt that they could adequately utilise the computer to support their normal educational activities.

Project 2: The KUALIDA and TEMPUS Projects, Albania

(a) The KUALIDA Project

This programme aims to establish an in-service training programme using open and distance resources for primary teachers of English, History, French, Geography, Albanian Language and Civics.

(b) TEMPUS programme:

Participation in an EU TEMPUS funded project for the restructuring of teacher education in Albania. This project is in partnership with the University of the West of England and the Royal School of Danish Educational Studies.

Project 3: The PPMU/ Ministry of Education in Egypt Project

The Egyptian government is rapidly establishing the infrastructure to support the development of open and distance learning (including the application of interactive computer technologies) in teacher education. The application of the new programmes will be initially directed at first phase Basic Education needs but this will be extended to other initiatives (secondary education, higher education) where staff trainers/retraining needs also exist. A number of centre members have been involved in evaluation and development work as consultants. The following two tasks are dealt with new technologies in particular.

1. Establishing an interactive computer technologies environment to support all aspects of the education reform programme in Egypt with initial focus on open and distance learning and teacher education.
2. Setting up resources (text, audio visual and electronic) to establish an ODL Resource Centre.

Project 4: The Project in partnership with SAIDE

One project is to set up 4-year part-time upgrading programmes with 50% school-based courses. This requires local communication centres for tutoring and uses interactive technologies. Furthermore, this programme is linked to school principals training programmes.

9.3 Technikon - South Africa

Analysis of drop-out rates in South Africa, resulting in inequality in school success of white and black pupils, has resulted in attempts of Technikon to deal with this issue by investing more in support provisions.

Victor (1997) describes a model for support in distance education, also building upon the potential of digital media. She states that the high failure rate in distance education institutions (she gives examples related to the University of South Africa (UNISA) and Technikon) can be seen as a symptom of inadequate models of distance education. % of graduates in 1997 as compared to the total enrollment since the start of the courses (1984/1988) vary between 4.7 and 17.4. She therefore states that for distance education to be successful, it should be more than just the distribution of course material, the evaluation of learner efforts and the administration of the education process. It should have courses that are designed to meet the needs of learners but most of all it should be enhanced by support to the learner.

She describes a general model to realize this and gives examples that help to prevent students to drop out of the system. The model developed (**Fout! Onbekende schakeloptie-instructie.**) is a recommendation of components of a learner support system for marginal distance learners at tertiary level, to guide them through the initial career development stages.

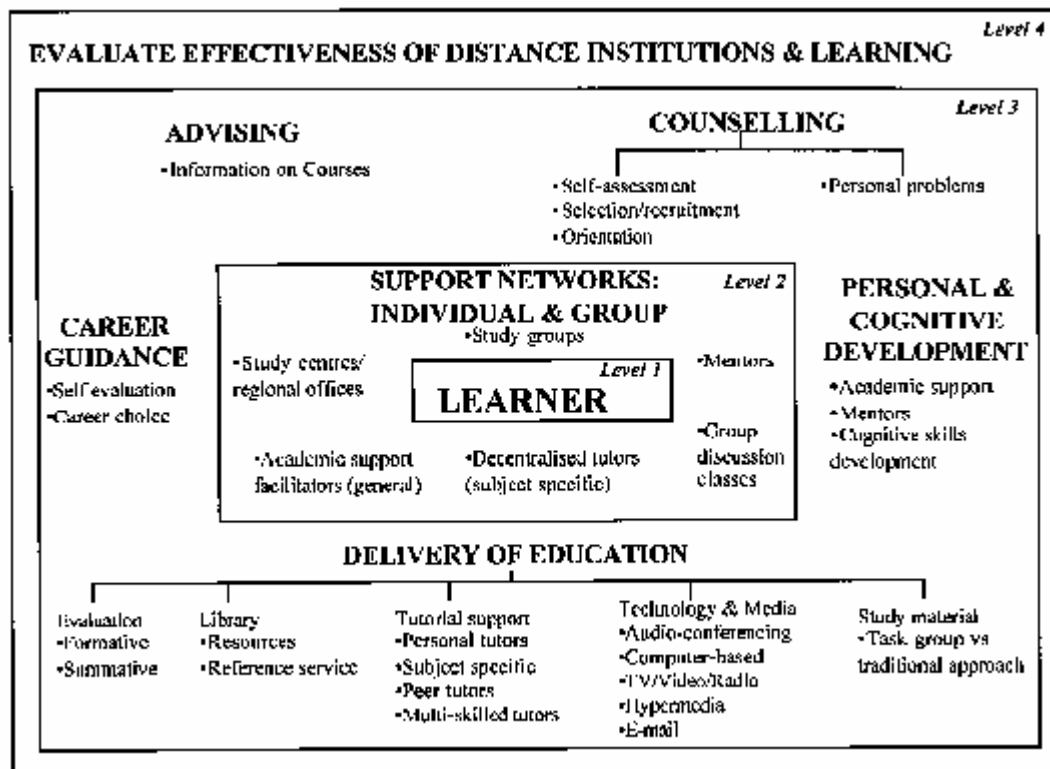


Figure Four! Onbekende schakeloptie-instructie.: Components model for a learner support system

Examples of action based on this model are:

- The Information Clearing Houses that are facilities to promote information flow by making appropriate information and resources available; such as info on technology-enhanced learning, existing physical infrastructure available for education and training, existing technologies, current South African and international technology-enhanced initiatives, South African and international evaluation reports, Course materials available, general research on the use of technologies in education and training, South African and international resource people organisations. More info from <http://pgw.org/telisa> or contact Paul West (pgwest@ibm.net)
- The job placement project assists learners in finding casual, temporary or full-time employment. A computerised database of approximately 3000 learners is kept at central campus and updated annually. The service is advertised (by mail shots, visits and through the Internet) to employers.
- Technikon SA uses a set of distance career guidance questionnaires. It serves as a self-evaluation for learners and guides them in making a career and study choice that is compatible with their aptitude, interest and personality. Learners who have Internet access can visit the Student Development Unit's web site at http://www.trsa.ac.za/main_campus/depts/sdu/sdu.htm.
- An academic support programme, called the HELP programme (Helping to Ensure Learner Progress) was developed. The HELP programme serves as an orientation to tertiary distance studies and develops the skills needed to progress successfully. It covers topics such as personal development, communication skills, reading, writing and study skills and preparing for interaction with the world.

9.4 The Commonwealth Of Learning - COL

COL is an international organization created by Commonwealth Heads of Government to encourage the development and sharing of open learning/distance education resources and technologies. The organization especially supports a high number of projects, centers, fellowships in international collaborations with developing countries. The COL-involvement clearly shows a high concern for all kinds of evaluative aspects as described earlier and in relation to the “systems approach” towards evaluation; such as needs analysis, student assessment, student follow-up, regional impact, building up evaluative expertise, etc. Typical projects are:

- Desk-top video production: a low-cost, relatively high-tech alternative for the Maldives for English language teaching at a distance.
- The Rajiv Gandhi fellowship scheme in collaboration with the Indira Gandhi National Open University (IGNOU): a pilot program in 15 developing countries to help students to acquire skills and experience to make contributions to enhance educational opportunities in their own country.
- The Commonwealth Educational Media Center for Asia that serves as a regional media information, resource, and training center; the center facilitates co-production for broadcasting, packaging, translation, programming, etc.
- Establishing a computer training center on the Copperbelt in northern Zambia.

More information can be obtained from www.col.org/models/table.htm

9.5 Laurentian University, International programs and projects

Mayer & Roy (1997) describe a Canadian-Chinese collaborative five-year project that helps to set up DDE/DDL-programs in Western China. The project focuses upon an external analysis of staff expertise and consequently the empowering of the local Chinese partner. The Chinese partner in the project is South Western Institute of Technology (SWIT) that services the entire Mianyang region, which encompasses many isolated and smaller cities, has a population of 5 million people, and covers some 20,000 square kilometers. Many of these people belong to one of the 55 minority ethnic groups officially recognized in China.

This project of Laurentian University is set up in close collaboration with the Canadian International Development Agency (www.acdi-cida.gc.ca, , Hull, Quebec, Canada).

The project currently (December 1998) is still running. As to evaluation, the project adopts a series of operational reviews. The following list presents the major questions of this mid-term review:

1. How does the program strategy provide an appropriate method for CIDA to support institutional capacity development needs in China?
2. How is the program designed providing an appropriate investment balance for each of the components of the program?

3. To what extent is the program goal and objectives being achieved?
4. What are the program achievements and effects on the partners capacity and relationships?
5. How efficiently is the program being implemented and managed?
6. What lessons are being learned that might guide the remainder of the program?

Project documentation consists of a macro-evaluation framework, that contains evaluation aims, evaluation areas, evaluation techniques, etc. In view of the different phases in the planning: pre-implementation, implementation, ongoing program operations, program handover/takeover, program outcomes, lasting impacts/post-program end.

More info can be obtained from Melissa Keeping (M.keeping@nickel.laurentian.ca), Manager International Programs and Projects.

10. List of tables

<i>Table 1: Comparison of second and third generation distance education approaches</i>	15
<i>Table 2: Interrelation between media and educational potential</i>	16
<i>Table 3: One-way and two-way technology applications in distance education</i>	17
<i>Table 4 Overview of evaluation dimensions</i>	18
<i>Table 5: Critical analysis of classical survey techniques in DE (Schultz et al., 1997).....</i>	20
<i>Table 6: A list of performance indicators applicable to (D)DE-settings</i>	21
<i>Table 7: Quality control at IGNOU.....</i>	46
<i>Table 8: Functional Model - Open Learning / Communications / Media—Examples</i>	74

11. List of figures

Figure 1: Student - Centric Networked System of Education (OPENET - Open Education Network)	30
Figure 2: Components model for a learner support system	78

12. List of abbreviations

abbreviation	background info
AECS	Association of European Correspondence Schools , http://www.xxlink.nl/aecs/index.htm
BRAOU	dr. B.R. Ambedkar Open University of India, Hyderabad, India.
CADE	Canadian Association for Distance Education (www.cade-aced.ca)
CALIBER-NET	A project in the context of the Socrates ODL (Open and Distance Learning) Programme of the European Commission. It focuses upon Quality in European Open and Distance Learning (http://europa.eu.int/en/comm/dg22/socrates/odl/quality.html).
CATV	Critical Analysis of community antenna TeleVision
CMC	Computer Mediated Communication: concept to assign all synchronous and a-synchronous uses of ICT to facilitate interaction
COL	Commonwealth of Learning, Vancouver, Canada (www.col.org)
CVT	Compressed Video Conferencing
DDE/DDL	Digital Distance Education - Third generation distance education
DE	Distance Education
EADTU	European Association of Distance Teaching Universities internetadres toevoegen
EC	European Commission (head office: Brussels), the central body that coordinates European policies (www.europa.eu.int)
ECB	Evaluation Capacity Building
EDEN	European Distance Education Network (www.eden.bme.hu)
ICDE	International Council for Distance Education (www.icde.org)
ICT	Information and Communication Technologies
IRR	internal-rate-of-return approach to cost-benefit-analysis
ITESM	Instituto Tecnológico y de Estudios Superiores de Monterrey: higher education institution in Mexico with a close collaboration with University of British Columbia, Canada (www.bsu.edu/international/cip/itesm.htm)
NPV	net-present-value approach to cost-benefit-analysis: amount of \$ to be invested in order to gain a certain return in the future
ODL	Open and Distance Learning
OFEK	OFEK is a private system for interactive distance learning via satellite and operates in a joint venture between Gilat Communications Ltd. (www.gilat.net) and the open University of Israel. It includes Lernet and Trainet.
OPENET	Indian Organisation structure for the national and state open universities and correspondence course institutions by the Distance Education Council Takwale (1997).
PB	pay-back and break-even approach to cost-benefit-analysis
PHARE	European development program, set up by the European Commission DG XIII with the aim to develop Central and Eastern European countries. Part of the program is multi-country

	cooperation in distance education.
ROI	return-on-investment approach to cost-benefit-analysis
SAS	Statistical Analysis System: computer package to analyse statistical data.
SOCRATES ODL	European action programme for cooperation in the field of education, set up by the European Commission Directorate General XXII to develop international projects; among them ODL-projects (www.connect.ie/domino/socrates.htm or http://europa.eu.int/en/comm/dg22/progr.html).
SPSS	Statistical Package for the Social Sciences
STOU	Sukothai Thammathirat Open University of Thailand
TEMPUS	Trans European cooperation scheme for higher education. This is a development programme adopted by the Council of Ministers of the European Community to develop education in Eastern European countries. It is operationalised in the Phare-programme (focus on Central and Eastern Europe) and the Tacis programme (focus on newly independent states, former Soviet Union and Mongolia). More info: http://ortelius.unifi.it/eup/tempus/introph.htm#index or http://europa.eu.int/en/comm/dg22/progr.html .
UNA	Universidad Nacional Abierta de Venezuela; part of the Universidad de Los Andes (loto.adm.ula.ve/una)
UNISA	University of South Africa, Pretoria (www.unisa.ac.za)
WWW	World Wide Web

13. List of experts contacted

- Bartolic-Zlomislic, Silvia, bartolic@cstudies.ubc.ca, Centre of Distance Education & Technology Continuing Studies, University of British Columbia
- Bates, Tony, tbates@ubc.ca, University of British Columbia, Director Centre of Distance Education & Technology Continuing Studies
- Bloomfield, Denise, denise_bloomfield@acdi-cida.gc.ca, Canada
- Bowermann, Chris, chris.bowerman@sunderland.ac.uk, University of Sunderland, UK

- Brown, Tom, tbrown@libarts.up.ac.za, <http://hagar.up.ac.za/buro/TomB.html>, Project Manager Telematic Education, University of Pretoria, South Africa 0002
- Burge, Elizabeth, burge@unb.ca, University of New Brunswick
- Claes, Christel, christel.claeys@linov.kuleuven.ac.be, <http://www.kuleuven.ac.be/linov>, LINOv, Katholieke Universiteit Leuven (B)
- Crawford, Gail, gail@athabasca.ca, Athabasca University, Center for Distance Education, Athabasca, Canada
- d'application d'étude et de ressources en apprentissage à distance, Canada
- de Beer, Kallie, kbeer@studm.tofs.ac.za, Head of Department of Distance education, Technikon Vrijstaat, South-Africa
- Dekkers, John, j.dekkers@cqu.edu.au, Central Queensland University, Open & Flexible Learning Systems. Queensland, Australia
- Devine, Jim, jimdevine@tinet.ie, Dun Laoghaire Institute of Art, Design and Technology, Dublin, Ireland
- Evans, Terry, tevans@deakin.edu.au, Deakin University, Faculty of Education, Deakin, Australia
- Glenny, Jenny, SAIDE@icon.co.za, Secret. National Association of distance education organisations of South Africa (NADEOSA).
- Haughey, Margaret, margaret.haughey@ualberta.ca, University of Alberta, Dept. of Educational Policy Studies, Edmonton, Canada
- Hilario; hilario@nambu.uem.mz, responsible project CHES Computer for Higher Education services, University of Mozambique
- Jae-Eun, Joo, j.joo@open.ac.uk, Project Officer, School of Education (CReTE), The Open University, UK
- Jewett, Frank, frank_jewett@qmbriage.calstate.edu, California State University, USA
- Keegan, Desmond, dei@tinet.ie
- Keeping, Melissa, mkeeping@nickel.laurentian.ca, Manager International programs and projects, Laurentian University, Sudbury, Ontario, Canada
- Kember, David, etkember@polyu.edu.hk, Coordinator of the Action Learning Project, EDU, Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong
- Koschmann, Timothy, tkoschmann@acm.org, Southern Illinois University, Dept. of Medical education, Springfield, IL, USA
- Lagacé, Sylvie, www.acdi-cida.gc.ca, Canadian International Development Agency, Hull, Quebec, Canada
- Levy, Phil, p.levy@sheffield.ac.uk, Lecturer, Department of Information Studies, University of Sheffield, Western Bank, Sheffield, UK
- Mansfield, Charlie, WUOCMA@lds.sunderland.ac.uk, University of Sunderland, UK
- Mason Robin, r.d.mason@open.ac.uk, Open University UK, Institute of Educational Technology
- Massingue, Venancio venancio@bandla.uem.mz, Vice-Rector University of Mozambique
- Mayer, Denis, DMAYER@NICKEL.LAURENTIAN.CA, Laurentian University, Student Affairs, Canada

- McGreal, Rory, mcgrealr@nbnet.nb.ca, <http://teleeducation.nb.ca>, Director Tele-Education, Canada
- Moon, Bob, r.e.moon@open.ac.uk, Director Centre for Research in Teacher Education, School of education, The Open University, UK
- Oliveira Dione, dione@guarancy.cpd.unb.br, Universidade de Brasil, Brasil
- Oliver, Ron, r.oliver@cowan.edu.au
- Patoine, Louise, lpatoine@teluq.quebec.ca, University of Quebec, Canada
- Patoine, Louise, lpatoine@teluq.quebec.ca, Manager Télé-université project, CAERENAD, le Centre
- Pritchard, Tony, alpr@mpx.com.au, tony.pritchard@old.edu.au, www.ola.edu.au, Open Learning Australia, Melbourne, Australia
- Rajasingham, Lalita, lalita.rajasingham@vuw.ac.nz, Victoria University of Wellington, School of Communications and Information Management, New Zealand
- Smit, Dr Elizabeth Smit, smitme@alpha.unisa.ac.za, Associate Director Centre for Peace Education, UNISA, Pretoria, South-Africa
- Sinclair, Desmond, desmonds@mail.tofs.ac.za, <http://www.tofs.ac.za>, Skakelbeampste: Fondswerwing, Technikon Vrystaat, Privaatsak X20539, Bloemfontein, South Africa
- Sirje Virkus, Sirje, sirvir@tpu.ee; svirkus@abo.fi , Ass. Prof., Head of the Chair of Information Science, Department of Information Studies, Faculty of Social Sciences, Tallinn University of Educational Sciences, Tallinn, Estonia