Distance Education Research : A Review of its Structure, Methodological Issues and Priority Areas

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Abstract: *Research literature of a discipline depicts the culture, concern and priorities of its own. They contain specialised knowledge unique to the discipline and reflect the research practices and methods adopted by scholars in their pursuit of research and development. The discipline of distance education having emerged from the domain of educational research has now its unique characteristics. It has a number of professional and research journals for reporting of research literature. This paper makes an attempt to review the distance education research literature from the viewpoint of its structure, methodological concerns and priority areas. The review concludes that researchers in open and distance education are very much concerned over the importance of research, areas of research requiring priority, ways to accomplish research, methodological rigour, ethical issues and research reporting.*

Introduction

For a discipline to be recognised as mature, research in its core domain of knowledge is highly necessary. The results of research are reported in periodicals and research monographs, which later on gets assimilated into textbooks. Research literature of a discipline shows the culture of the discipline. They contain the specialised knowledge and examples of research procedures that are unique to the discipline, by means of which the heritage of the discipline is maintained (Robbins, 1973). Distance Education is "a distinct field of educational research and training within the discipline of education" having links to other fields within the discipline of education (Keegan, 1990: 7). The related fields are educational technology, adult education, and the study of non-traditional/open system. On the other hand Holmberg (1996) while discussing the character and scope of distance education in the 1990s, confirms his earlier (1986) view of "distance education as a discipline in its own right" (p.20) based on the growth of research activities and university teaching of the subject. The 1980s witnessed an exponential growth of literature on distance education as a result of research in sub-fields like course design, economics of distance education, student support services, and media in distance education, and due to the emergence of a number of academic

Indian Jounral of Open Learning, 1998, 7(3), 267-282.
ISSN 0971-2690. Printed in India.

institutions with large research units, scattered individuals with a special interest in the field, and specially funded major projects. In 1985 Moore reviewed the distance education research literature of the last twenty years and commented "the condition of research in distance education is about what might be expected at this early stage in the growth of a new field of education" (p.36). Whereas, five years later Coldeway (1990) stated that distance education research is not planned, consolidated and/or reported in a systematic manner. However, researchers have now started emphasising on the ethical issues of distance education research, especially because, distance education is a social activity and much research depends on human beings as sources of data (Evans and Jakupec, 1996). A review of Distance Education research could be divided into three broad areas, viz. the structure of distance education research literature; methodological issues; and areas of research priority.

Structure of Distance Education Research Literature

Structure of a discipline forms the backbone of research for identifying gaps and areas of priority. According to Saba and Twitchell (1988) published research in the field of distance education covers two broad categories: conceptual studies and case studies. Literature of conceptual type, according to them has at least served three purposes: "offered definition for the field, provided conceptual models for various systems, and presented current and future trends in the field" (p.9).

It was Holmberg (1985), who first attempted to develop a classificatory base of distance education literature in thirteen sub-divisions in the 2nd edition of his *Status and Trends of Distance Education.* The sub-divisions identified for grouping literature in the bibliography part of this book includes the following:

1. Survey of distance education and of research into distance education
2. The characteristics, rationale and philosophy of distance education; theoretical approaches
3. Course development in general
   - 3.1 Curriculum and objectives of study
   - 3.2 Media
   - 3.3 Structure and typography of printed courses
4. Two-way communication
5. Distant students and their situations
6. Organisation and administration
7. Supervised correspondence study
8. Evaluation and economics of distance education
9. Application of case studies
10. History of distance education

11. Works of general aspects of education having special relevance to distance education
12. Periodicals concerned with distance education
13. Earlier bibliographies.

However, Holmberg (1986a) specifically described the structure of distance education discipline to consists of the following areas:

- Philosophy and theory of distance education;
- Distance students, their milieu, conditions, and study motivations;
- Subject matter presentation;
- Communication and interaction between students and their supporting organisation (tutors, counsellors, administrators, other students);
- Administtation and organisation;
- Economics;
- Systems (comparative distance education, typologies, evaluation, etc.);
- History of distance education.

Gupta and Renu Arun (1986) in an analysis of Indian writings on distance education categorised literature of the field in the following headings :

- Distance education : concepts, principles and perspectives;
- Distance education in Indian states : problems and future;
- Distance education in universities: open university;
- Distance education in different developing countries;
- Distance education : Impact, effectiveness and research;
- Mass media and new technologies in distance education;
- Course materials in distance education, production, training, etc.;
- Student assessment, evaluation, response sheets, support services, contact programmes, teaching/leaming situations;
- Emolments and dropouts in distance education;
- Management and administration of distance education;
- Distance education and rural / technical / vocational / educational professional training.

Calvert (1986) provided a conceptual framework for distance education research (Table 1), but discussed the Canadian distance education research literamre under the following headings: Students and curricula, learning at a distance, teachers at a distance,

supplementary support services, technology for instruction, other issues of computer technology, institutional policies and structure, relationships among institutions, and economics.

Table 1 : Conceptual framework for distance education research

Input Variables	Process Variables	Outcome Variables
Student	**Development**	**Student**
educational background	curriculum	enrolment
perceived needs	development model	academic progress
motivation	design of instruction	academic
learning styles	media	performance
study environments	course workload	use of materials and
	pricing	services
	production procedures	dropouts
System	**Delivery**	**System**
national requirement	recruitment methods	development
institutional policy	academic support	efficiency
financial resources	formal feedback	cost
technical resources		effectiveness
human resources		acceptance in the
geography		system

Source : Calvert (1986)

Panda (1992) also presented a similar conceptual framework, like that of Calvert, for distance educational research (Table 2) on the model of system philosophy. However, while grouping the distance education research literature in India, he identified nine areas as follows :

- Concept, Growth and Development
- Curriculum/Course Planning and Development
- Instruction/Teaching
- Media and Technology
- Learners and Learning
- Institutional Policy and Management
- Economics
- Evaluation/Programme Evaluation
- Staff Development

Table 2 : System perspective of distance education

Input	Process	Output
• Programme planning • Objectives as inputs • Staff development (material development, assessment and evaluation, tutoring and counselling administration, management, monitoring) * • Course (print, audio video etc.) * • Student(s) • Infrastructure • Time • Financing and budgeting	• Two-way communication (real and simulated) • Student's interaction with materials (learning style, strategy, pace, etc.) • Evaluation process • Student support services • Time management and decision making	• Students' achievement (grades/marks), and other skills • Student satisfaction • Student's relevance in the job market • Student employment and promotion • Relevance of staff development and acquired skills as further input • System efficiency as future input • Relevance and effectiveaness self-instructional materials as future inputs • Effectiveness and efficiency of the entire system • Effectiveness and efficiency of sub-systems**

* themselves are processes at 'input' stage; ** also a part of 'process'
Source : Panda (1992).

Sturrock and Howard (1989) analysed 33 full-length papers submitted to *Journal of Distance Education* over a period of twelve months and grouped them into the following eight topics:

1. Electronic communication
2. Evaluation of distance education programs and materials
3. Learner independence
4. Specific programmes
5. Distance Education - self definition
6. Innovations
7. Counselling and support systems
8. Reviews of the literature

Scriven (1991) reviewed the content and contributions that appeared in the Journal Distance Education from volume 1 to 10 and grouped the major 109 articles into the

following topics :

- Students and their characteristics
- Specific programmes and courses
- Telecommunications and media
- Specific countries - practices and procedures
- Theory
- Course design and development
- Economics and management
- Counselling and student support
- Tutors, staff development, staff involvement
- Unclassified

Jegede (1994) in a different context, in order to identify distance education research priorities in Australia, developed a questionnaire, which was validated by a panel of judges selected from a cross-section of experts in distance education, research methodology, communication and data analysis; contains twenty two broad groupings of research areas. They are as follows :

1. Theory and philosophy
2. Learner characteristics
3. Equity and access (compensating for disadvantage)
4. Design and development of study materials
5. Instructional and communication technology
6. Teleteaching and learning
7. Management and planning
8. Student support services
9. Development of students study skills
10. Systems for the provision of feedback to students
11. Interactive multimedia
12. Discipline based context
13. Cognition and metacognition
14. Cost benefit analysis
15. Relationship between open learning and distance education
16. Industrial and business training context
17. Research methodology

18. Evaluation
19. Expert learning systems
20. Role of distance education in national development
21. Teacher education
22. Professional development of distance educators

Most recently Calvert (1995) analysed 298 articles published in four leading journals of distance education: *American Journal of Distance Education (71), Distance Education (74), Journal of Distance Education (40) and Open Learning* (113), from 1990 to 1993 and identified the following topics: professional education, technology, evaluation, academic staff and professional development, student factors, educational design, research and theory, administration and management, interaction, quality, gender, student support, independence, collaboration and references to location (programme, institution, systems and country).

Methodological Issues in Distance Education Research

Choice of right research problem, suitable design and reporting are very important issues for meaningful research results. These issues also depend on who is conducting the research, as Calvert (1984) puts it:

> "Distance educators, the one who know their system well usually are newcomers to the field and have their roots in other disciplines, even when they do have solid research skills, they still must 're-tool' for this new research area. Furthermore, the emphasis in distance education system is in doing, not contemplation, most people in the field are administrators carrying a heavy workload. When special research units are established, they generally serve administration and focus on practical day-to-day issues" (p. 1).

Morgan (1984) reviewed the research literature on distance education that used "qualitative research' design and concluded that this approach can be fruitful for development of distance education, especially for generalisation, not in statistical sense, but in a phenomenological sense. Moore (1985) after having reviewed the research literature of last twenty years admitted that there are "only a handful of good projects which produce reliable generalisable and useful information" (p.36) and also there are "a massive volume of amateur, unsystematic and badly designed research producing information of very little value" (p.36). He was also concerned about the naive empiricism leading to one-off status reports and programme descriptions. Panda (1992) having analysed the distance education research literature in India also expressed concern about this issue and emphasised, "Most of the studies are either descriptive status surveys or experimental studies with poor methodological footing" (p.322).

According to Minnis (1985) research in distance education can be summarised as follows:

1. "most research remains overwhelmingly descriptive. The focus is narrow with emphasis on particular institutional problems (i.e. attrition, the non-start problem, comparison of teaching methods, etc.);

2. as a consequence of its problem-solving orientation; research reflects an a-historical and/or a-theoretical bias, ignoring the need for theory construction;
3. research tends to be context-specific, that is, few generalizations can be made beyond the specific population or sample studies;
4. research lacks meaningful cross-cultural or comparative perspectives;
5. the vast majority of research is heavily dependent on psychological paradigms which, despite the strengths associated with such paradigms, tend to reduce the problems of distance education to ones which are amenable to the manipulation of psychological variables only" (p. 191).

Therefore, Minnis recommended three methods — ethnography, case studies and grounded theory, as alternative research approaches designed to understand distance education phenomena to achieve the theoretical and conceptual depth of distance education.

Saba and Twitchell (1988) identified the use of different methods of enquiry for various functions of a distance education system and proposed 'system modelling approach'. The methods of inquiry, identified by them are as follows:

- "descriptive analysis used to show how distance education systems are organised and governed,
- cost-benefit analysis is used to study financing and budgeting of systems,
- survey methods are used to study utilization patterns and user attitudes towards the system, and
- experimental research methods are used to study learners and to measure learning outcomes" (p.10).

Moore (1985) analysed the studies reported by Childs (1965, 1969) and found that two-thirds of the research works were of survey and descriptive nature, and no less than one-third were experimental. Whereas on comparison to this he found the current research in weak methodological footing. Suens and Stevens (1993) reviewed research literature in distance education and found common analytic problems and errors such as significance testing, reliability and validity, error rate and reporting practices. In this respect Coldeway (1988) advised that distance educational researchers should understand issues relating to sampling, the concepts of statistical power, meaningful versus statistical significance, internal versus external validity and meta-analysis.

With respect to reporting, Moore (1985) emphasised:

> "if previous research was consulted - i.e., if there was a theoretical underpinning for the research - not only would there be better chance of an investigation which was not merely repetitive of previous work, but a new contribution to the theory might follow" (p.36).

In a recent paper Calvert (1995) reported, of the 298 articles analysed, only 17 contained no references, indicating a trend towards theoretical underpinning.

In a review of Indian writings on distance education Gupta and Renu Arun (1986) found that the contributors are distance educators in the universities and research efforts

in the domain of distance education have remained fragmentary and isolated. Interestingly a signifcant number of contributions they analysed were addresses to conferences, workshops, etc. which hardly can be called research. Mitchell (1991) in his editorial to *Distance Education* has identified another dimension of accessibility of source literature. He has gone to an extent of criticising the papers published in the same issue of the journal, as an illustration of the 'ordinariness' of research publications in Distance Education.

Mishra (1997) critically analysed 361 papers published in four leading journals of Distance Education, i.e. *American Journal of Distance Education, Distance Education, Indian Journal of Open Learning,* and *Open Learning,* and found that 47.64 per cent of papers were descriptive in nature. Survey method (21.32%) formed the next favourable method for Distance Education research. Interestingly the use of experimental research method, evaluation and qualitative methodology were relatively less used and concluded that "the subject has to go a long way in inculcating methodological rigour into research activities" (p.43). In terms of reference to previous research, only 9.14 per cent papers had no reference indicating a positive trend towards theoretical underpinning.

Areas of Research Priority in Distance Education

Most of the Distance Education Institutions all over the world have been established to provide education to a growing population of adult learners at a lower cost. In order to achieve the objectives, innovations based on empirical evidence need to be implemented. Marland (1989) sets three pressing reasons why distance education research should receive priority:

- "Distance learners constitute a sub-group of tertiary students whose instructional programmes and materials learning, contexts and problems differ markedly from those of their on-campus peers. Past experience has shown that it is imprudent to extrapolate from one setting to another.
- Since the 1970s there has been a dramatic worldwide upswing in the numbers of distance learners and of institutions offering distance learning programmes.
- Very little research into distance teaching and learning has been conducted that provides a basis for the evaluation of traditional assumptions and practices in the design and conduct of distance education programmes" (p. 178).

According to Coldeway (1988) there is room for all kinds of research, but more basic research into human learning and motivation; especially in the context of adult development, individualised study, learning from prose, the effect of technology on human behaviour, and the interaction between adult learning and adult lifestyle, is needed. Similarly Marland (1989) while discussing a paradigm for research on learning identified six main areas that invite research attention :

1. "the nature of students' espoused theories for learning from text including, for example, their goals, motives, beliefs, conceptions of learning and the learner's role, and study approaches – in short their educational and study orientations.
2. the nature of students' theories – in-use when learning from text, that is, their actual study approaches and styles; perceptions of text, assessment requirements, and lectures; and cognitive processing during study.

3. congruency (or lack of it) between espoused theory and theory-in-use.
4. effects of contextual variables, such as study background, career and family commitments, study environment, work environment and collegial relationships, and subjects being studies, on both espoused and in-use theories and mediating process.
5. effects of different textual formats on espoused and in-use theories and mediating processes, relationship between espoused and in-use theories and mediating processes on the one hand and learning outcomes on the other' (p.180).

Taylor (1989) with specifrc reference to South Asia has listed six areas on which research in distance education should be conducted. The areas are:

- factors affecting learning process of distance students;
- effectiveness of instructional strategies;
- cost-effectiveness of combinations of instructional media;
- evaluation of the usefulness of different distance education techniques in formal and non-formal educational context;
- economic impact of distance education and its role on national development;
- theoretical underpinning of distance education.

Panda (1992) after reviewing the research literature of distance education in Indian context, has listed five important broad research areas needing urgent attention, which he considers are not though comprehensive as such. The areas are :

- Curriculum planning and development, and developing a comprehensive model, with room for variations, within a given socio-cultural set up;
- Different modes of course development and testing their instructional components for wide implementation, including media-mix in different disciplines for optimum utilisation of media within a given budget;
- Instructional design-development-implementation, especially comparative studies on instructional strategies;
- Studies on distance learners and how they learn; and
- The approaches to co-ordination, information dissemination and exchange, and quality control within the process of distance education objectives.

In a review of research on distance education in Norway, Rekkedal (1993) has identified the following future research needs:

- Theory studies with relevance for distance education
- National policies and effects on distance education development and market research
- Different organisational forms and forms of co-operation
- Counselling and guidance
- Studies of the educational processes, learing media and two way communication

- Teacher roles-interests and attitude
- Efficiency and effect studies
- Different media-uses and applications
- The student's actual use of different media and interaction possibilities
- Intensive studies on methods of learing including direct observation.

Jegede (1994) reported in an empirical study of the opinion of distance educators and practitioners in Australia that the respondents believed more research is needed in virtually all areas. However, the areas that attracted seventy percent and above agreement amongst respondents as requiring concentration of research efforts are: learner characteristics, design and development of study materials, instructional and communication technologies, student support services, development of students study skills, systems for the provision of feedback to students, and evaluation. The areas identified in this study as requiring priority research attention are: instructional and communication technology, industrial and business training context, role of distance education in national development, student support services, evaluation, equity and access, design and development of study materials, and interactive multimedia.

The most comprehensive listing of research areas has been reported by Moore (1995) in his editorial to *American Journal of Distance Education* based on the proceedings of the "Distance Education Research Symposium: A Research Agenda" (1995). The areas identified are as follows:

Research on policy and administration

- The legitimacy of distance education in professional lives of faculty and administrators and the attendant change process necessary to provide distance education with "value added" for these professionals
- Finance and financial models-efficiency of investments in distance education and its measurement
- Changing the faculty culture for encouraging their participation in distance education
- Access, equity and social impact of programmes in relation to market driven approach, socio-economic impact and consumer protection policies
- Change models for applying research results to practice
- Effect of work styles and life styles on distance education and vice-versa, for administrators and faculty
- Evaluation of administrative practices in relation to socio-political issues and question of relevance.

Research on instruction

- Is frequency of interaction meaningful?
- Is understanding increased when interaction is present?

- Is there an influence on learner satisfaction?
- Is interaction more important for certain types of learners?
- Is there an optimum form/type of interaction in particular settings?
- What is the effect on retention?
- Are there changing patterns/levels of interaction over a course?
- What is the interplay between public and private interaction?
- What is the interplay between types of interaction occurring simultaneously?
- What do students like? want? need?
- How is cost effectiveness and learning effectiveness determined?

Research on course design

- Affective component in learning: recognising that course design can be both affective and cognitive
- Technology application in various designs
- Educational designs from instruction point of view
- Educational designs from the learners point of view, with reference to information overload
- Designing for collaborative learning
- Use of course design for learners to reflect
- Factors influencing course design efficacy
- Dimensions of learner-centred designs
- Changes from linear to multivariate models of course designs

Research on learners and learning

- Are we simply looking for a satisfied learner?
- Are we looking at who can do well on a course test?
- Are we starting to broaden our outlook and evaluate long-term, post-course results?
- Are we looking at outcomes where students have gained cognitive skills or may have acquired a broader level of learning strategies that they did not have before?
- How do we assess the kind of process that help students engage in "meaning making"?
- How various media contribute to learner outcomes?
- The extent to which research looks at learning in its total context.

Conclusion

To strengthen research activities, while expressing his predicament over distance education research Moore (198 suggests an understanding of the life cycle of distance education. According to him, distance education:

> "is in a stage of childhood, past infancy but not yet grown up. In infancy there was a dominant emphasis on the immediate gratification of the needs of practitioners - i.e. researchers must help them solve their every day problems. Then comes an emphasis on description - on telling the world what we are like through studies of participation and individual program experiences. Adolescence comes with the formulation of a body of theory, which holds together in an explanatory framework the previously disparate pieces of the field. We then encounter a mature concern for testing and questioning and refining our theory, the frequency of experimental research increases as the theoretical base is built up" (p.43).

Panda (1995) has made a strong case for 'institutional research' and elaborates:

> "The controversy between systemic research and discipline-based research in distance teaching institutions notwithstanding, the utilisation potential of research would be enhanced once it is institutionally sponsored. Though it does not delimit a distance teacher to undertake one's own private research, it is the same academic who would eventually work for the institution on the institutional project(s). Given the ground reality in the sector of higher education in general and distance teaching institutions in particular, it is the understanding and visionary leadership with strong commitment to the system which can initiate and help the growth of institutional distance education research as an ongoing process and as a built-in mechanism within the framework of distance education institution or network" (p.482).

Koul (1993) has emphasised the role of collaboration in research and development in distance education and provided four reasons for collaborative efforts :

- Most of the institutions face similar difficulties especially financial resource crunch, and collaboration would help save funds, human energy and time.
- Collaboration will counteract the tradition of isolated research and increase professional communication across countries.
- Collaborative research shall be a major mechanism for globalisation and international perspectives in relation to mobility of students, credit transfer, adaptation and adoption of course, etc.
- In view of the modem technological changes, institutions need to share experiences and ways to imbibe change for innovation and effective application of technology for developmental purposes.

Recently in an article Evans and Jakupec (1996) expressed concern over ethical issues in distance education research and recommended two principles that researchers in this area should follow :

> "(i) research in open and distance education should not expose individuals to risks of or cause unjustified political, personal, economic, physical, emotional, moral or psychological harm; (ii) researchers in open and distance education ought not to undertake research which violates principles of free informed consent" (p.91).