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Beyond Cost-Effective Analysis of Distance Education*

Abstract

Caught between the conflicting forces of the need of extending higher education to learners in remote and distant governments across the country, Canadian universities, in various formats and approaches, contemplate to utilize or already adopt the latest technology to implement distance education. Literature review on research in this area seems to reflect an obsessed perspective of ensuring cost-effectiveness in distant delivery, forgetting some of the more fundamental issues that need to be addressed in embarking on the extension of services to clientele. The writers examine some of the empirical data collected and the experiences accumulated in Manitoba to drive home the necessities and significance of accommodating these issues, so as to ensure that the basic mission and vitality of the institutes of higher learning will remain intact in the years ahead.

Résumé

La nécessité d'offrir aux habitants des régions éloignées la possibilité de suivre des études supérieures ont amené les universités canadiennes à envisager le recours à des techniques de pointe au titre de l'enseignement à distance ou à les adopter. La bibliographie des recherches menées dans ce secteur traduit la nécessité quasi obsessionnelle de veiller à la rentabilité de l'enseignement à distance, au détriment de problèmes beaucoup plus fondamentaux qu'il convient de résoudre si l'on veut étendre la présentation de ce type de services. Les auteurs examinent des données empiriques et les résultats d'expériences menées au Manitoba dans le but de faire comprendre la nécessité et l'importance de ces problèmes pour préserver, à l'avenir, la mission de base et la vitalité des établissements d'enseignement supérieur.

In the face of severe funding restraints and program cutbacks, Canadian universities and many institutes of higher learning in the western countries have been confronted with the problem of maintaining their public services with reduced resources. To many educators technological advancement which spearheads a new version of distance education represents, perhaps, one of the few bright spots in an otherwise bleak landscape of Canadian higher education. Distance education triggers, understandably, a considerable amount of international attention and research, notably in the area of evaluation.

In this paper, an attempt is made to propose a conceptual framework (Figure 1) to appraise the current assessment of methodologies on distance education. This appraisal is accompanied by Manitoban examples to substantiate the explicit as well as implicit principles inherent in the framework.

Explicit in the framework is the writers' strong conviction that distance education, like other delivery programs on university campuses, should reflect the major objectives and missions of the institute of higher learning. In other words, it should be efficiently operated. It should enhance the equality of educational opportunities for all irrespective of their geographical location. It should (in the long run) bring about the economic and social benefits to the community and society at large.

By restating efficiency of delivery, we empathize with the present need for austerity, and the financial necessity of maximizing return within the current resource constraints. However, in complying to this general principle, we stress that evaluation of distance education should be broadened beyond the rigid adherence of the cost-effectiveness analysis of the operation as has been the prevailing trend in literature. At least three layers of important elements should be considered in the comprehensive evaluation process so that austerity is not the ultimate criterion for determining whether a program should or should not be delivered.

At its outset, evaluation of distant course delivery should take into account not just the operational efficiency but the internal efficiency as well. By internal efficiency, we refer to the beneficial impact on the learners, the learners' achievements, the number of learners who successfully complete the courses or programs and, perhaps, the degree of satisfaction with the learning experience. While operational efficiency might be a concern for the institution as to whether it can afford to continue to offer the course/programs or not, we would argue that internal efficiency is far more crucial in program delivery in the long run. If operational efficiency is the sole concern, the institute of higher learning can easily turn into a "paper mill", prospering on a short term by generating hundreds and thousands of certificates that are of little value. On the longer term, the quality of education is seriously weakened and the damage to the reputation of the institution is beyond repair.

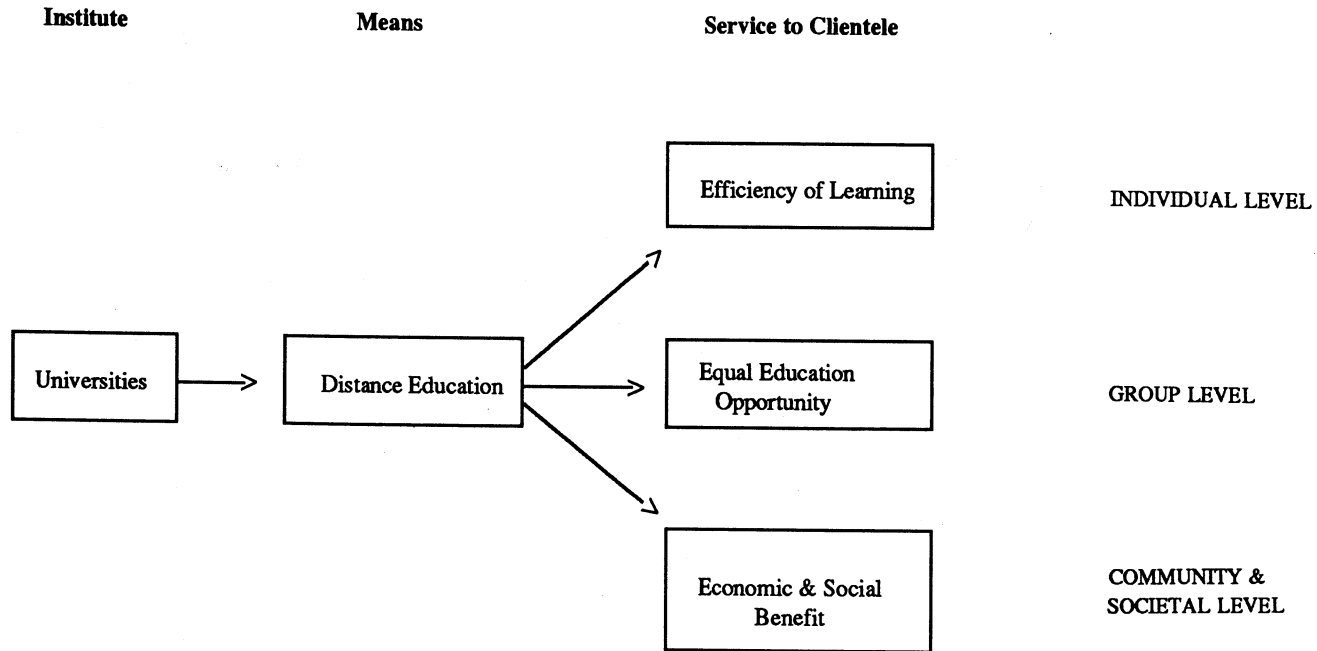


Figure 1
A Model Depicting the Role of Distance Education

If distance education is of any significance, aside from another format of delivering a program, it lies squarely in the social realm of enhancing equality of educational opportunities, which should never become obscured in the present quest for financial efficiency. Implicitly and explicitly, failure to adhere to this philosophical orientation amounts to a betrayal of the public mandate to make available liberal post-secondary education to the mass, given that government loans and bursaries are set up precisely with this wide access in mind. It inflicts not only social injustice to those who, for one reason or another, cannot physically be present on campus, but heightens the political tension between those who have and those who have not, between the educated and the illiterate or functional illiterate.

The ultimate objective of distance education is perhaps the provision of the economic and social externalities to geographical areas normally beyond the reach of higher education. By addressing the less tangible and often neglected, but nonetheless an important dimension in assessing program delivery, we emphasize the need for taking a long-term view in appraising the economic and social benefits (be it quantitative or qualitative in nature) education brings to individuals, groups, and communities, which is well documented by research findings in the domain of economics of education (Mincer, 1984; Psacharopoulos, 1981, 1986).

In the context of such a conceptualization, let us reexamine, briefly, background developments in distance education, the current assessment literature in this area, and the fundamental issues arising from the conceptualization, which are inherent in some of the existing pilot/established projects in Manitoba.

Background development in distance education

Historically, distance education has been almost exclusively correspondence education. In the main, funded by the government on a cost-per-student less than that of on-campus offerings, proprietary distance education institutions or extension departments of many universities were expected to be self-supporting. Malpractice, either in structuring curriculum or in dealing with learners' needs, while difficult to establish, was found to be possible (e.g., Karow, 1978; White, 1975), given the very fact that self-sufficiency requires producing learning materials as cheaply and enrolling as many students as possible. These problems, as Keegan (1986) noted, have depressed distance education into an unenviable state from which it has not fully recovered.

The inception and apparent success of the UK Open University has, however, rekindled faith in the possibility of producing quality education by alternative means. To the traditional correspondence-type learning materials,

texts and readers, television broadcasts, radio broadcasts, and on-occasion-laboratory kits, audio tapes, slidepacks, and computer simulations, the Open University has an impressive organization of regional offices, study centres, tutor-counsellors, course tutors, evening and Saturday tutorials, laboratory/field sessions, summer schools, replay and group discussion, tuition by telephone, computer-based record systems, and student social organizations (Keegan, 1986). Research focus in distance education has shifted to the cost-effective comparison of the conventional and alternative approaches. The difficulties inherent in undertaking the economic analysis are not to be understated. Nonetheless, preceded by a number of the American articles (e.g., Becker, 1964; Shultz, 1961), the parameters for defining and measuring output and for assigning costs to different components of an educational enterprise were made lucid by Laidlaw and Layard (1974), Lumsden and Ritchie (1975), Snowden and Daniel (1980), and Wagner (1972, 1973).

Review of literature on current assessment of distance education

Literature in this domain is overwhelmingly quantitative. Various mathematical models for estimating the cost for distance education have been proposed. Some used equations involving fixed and variable costs for courses and central university (e.g., Laidlaw & Layard, 1974). Some estimated the cost on the basis of organization, number of courses, and number of students (e.g., Neil, Rumble, & Tout, 1979). Some assessed distance education cost from the two functions of course development and services delivery (Snowden & Daniel, 1980). There are still others (Guiton, 1982), who devised equations to take into consideration the more diverse resource allocation in the more conventional two-mode universities. In spite of the availability of a number of models, and the growing sophistication of the analysis, these proposed frameworks share the same objectives of trying to determine the economies of scale and of attempting to provide guidance for other distance systems.

Problems of existing formats of cost-effective analysis

All these efforts, unfortunately, can be criticized on four counts: first, all the cost formulae suffer some inherent limitations. They fail to include in sufficient detail all the fundamental variables which affect the cost of the operation. Readers have difficulties in associating the amount of savings with the removal or addition of each component in the planning, organization, and delivery of different operational models of distance education. Further, the cost models are all based on current expenditure patterns and do not measure cost-efficiency which seems to be the ultimate objective of the economic analysis. In other words, they do not shed light on the cost effective use of available resources, failing to demonstrate, for instance, that the same quality of output of students can be achieved by dropping one of the variables. In

short, as Rumble (1982) aptly observed, if the formula-based budgeting were to be accepted without question, it would leave untouched the waste that is in the system and reinforce suboptimization.

Second, on a broader perspective, the pursuit for a universal economics of scale is as futile as the search in the early seventies for an optimal size with which a school division/district can operate (e.g., Lam, 1982; Sher & Tompkins, 1977). In general, economics of scale is governed by a host of local factors: size of student populations, institutional characteristics, financial shrewdness of individual managers, resource allocation, to name a few. These particularistic ingredients defy quantification and generalization. Indeed the eclectic selections of key cost components evidenced in many existing formulae reinforces the conviction that they are basically institution-specific, providing little guidance for other systems.

Third, the typical criterion of assessing "cost-effectiveness" by comparing relative costs of distance education with the conventional approach is, strictly speaking, not a true measure of "effectiveness". The obvious fact is that the conventional on-campus education cannot be shown to be cost-effective. If the cost incurred on on-campus education represents what the public is willing to support, the comparison amounts to nothing but the ranges of deviations within which the cost of distance education is "politically acceptable."

Fourth, the obsession with economic efficiency, in many situations, runs counter to the principles enriching learning experiences for students. Cost-effective research, for instance, has demonstrated that the more face-to-face tuition built into a distance teaching system (Rumble, 1982), a critical element in humanizing this approach, the nearer variable student costs will approach those in conventional universities. Further, as the amount of media and materials is increased, both important in motivating and arousing interest, the cost advantage of distance education over the conventional approach will be undermined. All these economic concerns (e.g., Keegan & Rumble, 1982), play neatly into the hands of the critics (e.g., Carter, 1973) who insist that higher education exists to provide an **educational experience**, not just to turn out **equivalent graduates**. The confusion that advocates of cost efficiency models encounter, seemingly lies in their inability to acknowledge that education is much more than instruction or transmission of knowledge. Any further push for cost efficiency will likely lead us to regress to the inhumane and impersonal way of information dissemination from which the present format of distance education, with the assistance of modern technology and media, attempts to break away.

New dimensions of assessing distance education

In line with principles outlined in the proposed framework, assessment of distance education must emerge beyond too narrow a parameter. Formula-

based models have already been shown to be inadequate in dealing with the efficiency of distance delivery. What is needed is a shift of our initial focus from dollars to that of learners' educational needs in attaining internal efficiency in the delivery system.

Internal efficiency. To achieve the internal efficiency, more attention should be paid to ways that promote students' efficiency in learning and that enhance their satisfaction in the process of acquiring new knowledge. In this respect, research on how an adult learns (e.g., Cross, 1981; Darkenwald & Merriam, 1982; Houle, 1961; Kidd, 1958; Knowles, 1980) casts an invaluable light. Indeed, if distance education is to ensure the quality of delivery and gratification of education is to ensure the quality of delivery and gratification of total learning experiences for adult learners, it has to make reference to the principles of andragogy (highlighted in the following paragraph) in all stages of its execution.

In compliance with the major suggestions from andragogy, the six education courses designed for distance delivery at Brandon all include periodic teleconferencing which ensures that learners are active participants rather than passive listeners or readers (Hilgard & Bower, 1966; Rogers, 1969) and that there are opportunities for student-student interaction (e.g., Bruner, 1966). To ensure that the resource materials (i.e., reading materials, video-cassette tapes, etc.) are appropriate to learners' levels of experiences (Rogers, 1969), trial runs of these materials were first introduced to the comparable regular on-campus classes prior to their inclusion in the distance education package. Major assignments, while relevant to the topics of the courses, accommodate a wide latitude of students' choice so that they can integrate their own experiences with what they study. This provision is specifically designed to offer opportunities for student-centred learning, a critical aspect of andragogy (Knowles, 1980; Lindmann, 1978) to take place. At the end of each section of the curriculum, a short test is included and the instructors involved in this mode of delivery are advised to provide prompt feedback to the learners so that they can perform their own assessment on their degree of attainment of course goals (Gibb, 1960). Furthermore, in view of the fact that adult learners, especially those far away from the structured learning environments, tend to vary in their pace of progress, particularly in the completion of assignments, a period of extension is built into the distance course delivery for students to meet all course requirements.

In the subsequent course evaluations based on the 150 students who had participated in this distance education project, it was found that 73% of the sample expressed overall satisfaction with the courses taken. Further analysis revealed that the pace of progress in the course, appropriateness of the reading materials, and opportunities for student-centred learning were the most significant contributing factors to such satisfaction. Distance of stu-

dents' residence away from the campus and the level of learners' formal education also played a role in enhancing their appreciation of the delivery system. While the failure rate is comparable to that of on-campus students (13%), it is encouraging to know that the withdrawal rate (5%) is far lower than the average on campus (20%).

In terms of cost, the distance education courses developed in a small western Manitoba university are conceived in two main components, production and delivery, described by Snowden and Daniel (1980). However, unlike the single-mode delivery system in the latter case, the production of distance education courses is mainly in the form of converting existing campus courses, and the main expenditure items in the delivery components involve instructors' salaries and telephone charges. In the context of the present format, the overall expenditure for producing and delivering a distance course is about 30-50% higher than the regular on-campus course in the first year but quite comparable to the conventional method of off-campus instruction. It is anticipated that the recurrent cost of running these courses and updating the contents within a five-year cycle would in fact decrease, as drastic revision and revamping of the course structure and content within that period is unnecessary. If such a projection is correct, distance education in the present format will be cost-effective compared with those run on regular delivery, while it maintains high internal efficiency as far as learners' experiences are concerned.

From the analysis, it seems that in designing distance education, program planners should contemplate the quality of course delivery and tailor the budget on a long term basis. Only when learning experience is meaningful to adult learners can we count on their continued participation and on the eventual cost-effectiveness. It is encouraging to note that more recent efforts in distance education (e.g., Sparkes, 1985; Spencer, 1980) all register a revived attention to the quality of learners' experiences.

Equal educational opportunity. A second fundamental issue stressed in our proposed framework emphasizes the fact that beyond the immediate concern for internal efficiency is equalizing educational opportunities for all, irrespective of learners' locations. Given the massive evidence provided by economic analysis of productivity and rate of return attributable to education, the provision of educational opportunity is prerequisite to individual as well as group economic and social equality. Legally, too, the equality clause (section 15) of the *Charters of Rights and Freedom*, by insisting on non-discrimination, sharpens our awareness of the desirability to extend university services to regions normally too remote to have easy access to higher education.

A concrete example of bringing universities to the northern and remote communities in Manitoba is the formation of Interuniversities North, a cooperative program of three Manitoba universities to deliver credit courses north

of the 53rd parallel. Prompted by the initiative of the Manitoba Department of Education in 1969, the three universities began to respond to the expressed needs of the northerners by engaging in a face-to-face distance delivery of universities' credit hours. In recent years, teleconferencing has been integrated so that essentially there are three distinct components of course delivery: engagement of qualified northern sessional instructors; transportation of on-campus professors for course instruction to northern communities; and delivery by teleconference to various remote localities.

Embedded in this cooperative program are the intricate credit transfers of northern students from one university to another. The necessity of satisfying northern needs overwhelms the typical inter-institutional barriers to make free course/program access and transfer a reality.

If one is to examine the cost of on-site distance delivery by southern instructors in the present fashion, one would find the expenditure is about double, compared to that offered on campus or in southern communities. Yet this relatively high expenditure is readily justified in view of regional equality, political necessity, economic equity, and social justice.

Affirmative action

A third fundamental issue in the assessment of distance education is to take a critical look at the latitudes this delivery system puts into use. An increasing number of Canadian universities has adopted this delivery system as a deliberate strategy of intervention (or termed "affirmative action") so that the traditional underprivileged minority groups – notably native Canadians – would also have the opportunity for higher education. Prompted by the movement towards local control and greater autonomy in the reserves, the affirmative action arrives just about the right time for preparing indigenous people to take a more active role in the new political order. The calculated benefit for such an intervention has gone beyond the individual learners, and beyond specific geographical locations. Indeed, through education, it has aimed for the elevation socially and economically of a depressed minority with the eventual goal for ensuring higher productivity and vitality of the entire nation.

An example of this venture is a native teacher education program, completely funded by the federal and Manitoba provincial governments and operated by Brandon University. Teaching centres in various native communities are established for a specified period when local authorities see a need and apply. The project adheres to the same motto as Interuniversities North program of bringing the university to the learners. Arrangements are made for travelling professors to come in sequence to these communities to deliver courses. To ensure that these students should have the privileges of having a

taste of campus life, they are brought to the university campus to continue their studies in summer sessions. Substantial support and counselling services have been built into the program to minimize cultural shocks and to help overcome difficulties in academic work. All these measures aim at achieving a greater success rate for the deprived.

In terms of its operating expenditure, the native teacher program is about 40% higher per three-credit hours compared with Interuniversities North program. Yet the social and psychological benefits of this program are widely recognized. Such outcomes have defied, to a large extent, quantitative measures, aside from the more obvious statistics that, together with other native projects on the Brandon campus, it has produced over 500 native teachers making up the central core of the teaching force in many native communities. Understandably, with the emergence of this professional corps recruited and stationed in the local communities, the once notoriously high rate of annual staff turnover in the schools run by the Department of Indian Affairs has now been contained. The once dispirited youth who displayed no educational aspiration beyond the minimum have now models to follow and higher goals to pursue. The renewed confidence of the natives should prepare them to take pride in their own cultural heritage, and to accept the cultural diversity in the pluralistic structure of the Canadian society. Whatever the long-term social and cultural externalities the project may bring, there is little doubt that the gathering momentum of political awakening and local autonomy in matters of education among the Indians at present owes its impetus to the presence of the indigenous professional force.

Conclusion

In responding to the economic austerity presently encountered in most western higher education, there is an obvious tendency for institutions of higher learning to engage in too narrow a framework for analyzing alternative program delivery, in this case, distance education. It has been stressed in the present paper that most of the economic analyses available have not fully addressed the question of internal efficiency that they have set out to assess. If one broadens the scope to include a more encompassing cost-benefit analysis, one would immediately realize that beyond the question of internal efficiency, there are more fundamental concerns for students as individual learning begins, for the political, social, and cultural externalities which are hard to quantify but nonetheless significant for the planning and implementation of distance education. What the present economic analysis of distance education has done is to create false expectations and illusions about their ultimate utility, sidestepping crucial issues for the undertaking of alternative modes of course delivery.

In view of technological advancement, knowledge explosion, acceptance of life-long learning, consciousness of social equality and justice, it is critical that institutions of higher learning should make greater commitment

to distance education. The critical task for program planners is to embrace an all-encompassing vision for continuously exploring alternatives, and experimenting with innovative allocation of existing resources to ensure quality of learning experiences and welfare of all participants in higher education. After all, the future of the universities depends solely on how well they serve the traditional constituency and how well they reach the new clientele.

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