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Planning Curricula For An Information Society

By

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PLANNING CURRICULA FOR AN INFORMATION SOCIETY

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Introduction

In this paper, I plan to indulge in the art of futurology. I hope to make some prophesies about the future shape and configuration of society, as a result of the new information communication technologies, or INFOCOM, for short, and to draw some implications of these innovations on education in general and on communication education in particular. Based on these implications an experimental "transitional" curricula will be offered for discussion and comment.

There are many reasons why it is tempting to prophesy. Prophesies are about the future. Talking about the future without having to specify any time frame makes it doubly tempting. As there will always be a indeterminate future, there is no way the prediction can be falsified or put to test. Secondly, since it is about the future, there is perhaps no likelihood, that the same audience to which the prediction is addressed, has any occasion to reassemble and recall the exact prediction, so one is insulated from either censure or verification. The prediction I make is in itself not controversial; and one in fact much discussed on the literature that we are in the midst of an information revolution. We will be entering what is commonly known as the Information Age, or the
Information Society, and will become an Information or an Infor-
matised Society.

There are three different sources of data for this prediction. One is the literature on communications which is replete with mention of this revolution as the onset of a new stage in societal development, something inexorable, something inevitable. This stage is already upon us, manifesting itself now in the United States, from whose womb, this complex of OCOM technologies first came about. Although some aspects of these empirical studies are controversial, the evidence as to this new stage of societal development coming into being is quite uncontroversial. More than two decades ago, an innovative study by Fritz Machlup on what was then defined by him as the knowledge industries in the US, generated several suggestive hypotheses. One, was the growing importance of these "industries", two, that this sector was growing more rapidly than even the industrial and agricultural sectors; three, that these industries accounted for 40% of the workforce and about one-third of the annual gross national product in the US. In 1977 a US department of commerce study by Marc Porat strengthened and confirmed these findings. The third source comes from reports of decades of scientific discoveries synthesising many scientific disciplines which have brought together a powerful technological package of innovations for the handling, processing and distribution of information. The development of the micro-chip, the phenomenal increase in the density of functions in each chip
through very large scale integration or VLSI, in the field of computerisation, the marriage with telecommunications advances such as the use of communication satellites, and optical fibres, have led to the emergence of an integrated industry having far reaching implications for society. It is based on the force and potential of such a technological innovation that the information society, it is said, will ultimately lead to the entire world functioning as one wired global city.

The Coming Information Age

What are some of the characteristics of a society that is all wired up for information? One characteristic is the mass consumerisation of high technology information services. Not only are these high technologies freely available throughout the society but all of the society is wired together. This phenomenon has been described as leading to a situation where (Dordick, p. 3) "users interact with one or more computers, associated data files and problem-solving algorithms from remote terminals. It may include access to distributed information systems within and between organisations, remote transaction recording, data inquiry and computer conferencing." The collective name given for such services is NIS, or network information.

Several factors make such a network possible. First there has to be a convergence of communication modes, then the marriage of the computer
to telecommunications, and to mass media channels. The home television becomes an intelligent terminal, providing a broad range of information.

When this stage is reached it will be the final sequel to two preliminary stages: first, what has been called the primary information sector. In this sector, a few large users of information bases are present. In the second stage, the number of such users expands and increases, to both public and private primary users of the new high technology framework - such is the case now with large government departments and large multinational companies relying on such information technology. The final stage is reached when computer networking is available on a mass consumer basis. Data services are available at home e.g. through the British Prestel system. Mountains of information are stored in mass assembly data banks, and made available through mass merchandising methods. Networks like Tymnet, and computer access data services like Compuserve are already commonplace in the United States.

A second characteristic arising from the increase in computation ability is the burgeoning of information data bases, with a corresponding vast increase in specialised scientific and technical (instrumental) information, relative to news and entertainment. Mass assembly data banks, storing mountains of information e.g. the entire holdings of the US Library of Congress,
will become universally available. Such technological codifications of knowledge will be especially prevalent in the field of science information - leading to easier availability of such instrumental knowledge - accelerating yet further a trend which has been documented extensively.

One indicator of the astounding increase in scientific knowledge is the number of scientific journals now being produced as compared to previous years. In his classic book on Little Science, Big Science, Price estimates the existence of 2 journals in the mid-17th century, rising to 100 in 1800 and 50,000 in 1963. Present day journals can only be estimated to number 100,000 - a fact which is in itself an indicator of the exponential growth of scientific knowledge.

A third characteristic is the replacement of the era of mass communications with more personalised, segmented and specialised information. One early follower of this trend is the modern news agency which now finds it more profitable to transmit economics and business information than even news, its previous economic mainstay. Digitalisation of information into binary bits will reduce all information flows into a common stream of electrical signals - one system to handle all types of information flows using a uniform system will allow for more complete interconnection and integration of what has been completely separated information and communication functions. In this way, print, video and voice...
communication becomes fused into one common stream, making redundant previous distinctions such as separate institutional arrangements for radio and television, print journalism and telephone services. The flow of information, it is envisaged, will be more transnational than either national or international; it will be more person-to-person than mass, and there will be more diversity, more equalisation and because of the difficulty to censor and limit, more unrestrained freer flow.

Although there is no consensus as to exact effects, there is agreement among communication specialists that the effects when brought about, will be deep and far-reaching on the rest of society. Some of the effects being mentioned can be listed and discussed briefly as consisting of:

* technology determining a new international division of labour, with information processing ability and the ability to absorb and use information as key determinants of productivity and economic wealth.

* technology replacing geography as the key element in national power, through compression of time and space, and the massive destructive ability of modern technological weapons. Control of the hinterland for instance, in the past, is now no guarantee of time lag in any defence calculations.
* deurbanisation will occur, with the dissipation of benefits from localisation and industrial centralisation. Large scale production units as was common during the industrial production period, may give way to more optimal medium or small work units, even individual work units, interconnected through networks.

* consequently, work loses its place as the cornerstone of social organisation, after having been so for centuries. Both the value of work and work as value loses importance. Automated work processes such as robotics replace labour, leading to retrenchment, and increased leisure, both voluntary and forced.

Although it is easy to dismiss these coming changes to our society as being remote, comforting though this thought may be, the truth is however quite the opposite. These technologies are quite entrenched in Third World countries. Computerisation is being widely used by government departments as a matter of necessity. The Malaysian telecommunications department is planning a data network system for the country, and currently experiments are being conducted on different versions of videotext, and prestel. Characteristic of the compression in time and space, mentioned earlier, the lag time in adoption of these technologies too is now much shorter when compared to the adoption of previous innovations. Within one or two years of their widespread adoption
in the developed western countries, they are being marketed in developing societies. It is urgent and pressing and necessary to face up to these issues so that the international structures which emerge to control these technologies can have beneficial not negative impacts on Third World countries. If these technologies are available on a purely commercial basis without any means of public compensatory measures, given the already present structural constraints in third world countries, they will aggravate not solve any of the present problems. Commercial oriented exploitation of these technologies will strengthen vertical rather than horizontal communications, reinforcing the existing flow patterns with Third World countries as passive markets, and stymieing the chance to develop grass roots, socially and politically interactive communication networks.

In the face of these wide ranging and influential technologies, it is easy to fall back on extreme stock responses. One could easily be over-optimistic about what the technology itself can do. One has only to look back retrospectively at the euphoria caused by the introduction of television, radio and even the telephone. It is easy too, to apply the technological "fix" to all of society's problems, and to compare for instance, the successful launching of the rockets to distant planets, the successful use of the space shuttle with for instance, the solution of poverty, inflation or racial problems - not recognising that while one set of problems are technical, the other set involves conflicts in human values,
and the need to set priorities among these values. Although a case can be made on a broad macro-social basis for some form of technological determinism, a la Marshall McLuhan, e.g. the contribution of book mass book publishing to the rise of the middle class, or the rise of new technocratic classes as being supported by the newer disciplines, e.g. economics, psychology and sociology, a healthy skepticism should accompany and be built into purely technocratic solutions. Against this kind of easy prescription, a recollection of Jacques Ellul's list of paradoxes of technical progress may be timely as well as salutary.

* all technical progress exacts a price; that is, while it adds something on the one hand, it subtracts something on the other.

* all technical progress raises more problems than it solves, tempts us to see the consequent problems as technical in nature, and prods us to seek technical solutions to them.

* the negative effects of technological innovation are inseparable from the positive. It is naive to say that technology is neutral, that it may be used for good or bad ends; the good and bad effects are, in fact, simultaneous and inseparable.

* all technological innovations have unforeseeable effects.
While admitting that Ellul's skepticism may have fitted earlier
technologies, I am myself unsure if they apply with equal strength
to the new information technologies. In several senses, the
changes impelled by these INFOCOM are of an entire order of
magnitude. They converge to together form a cohesive set of
information collecting processing, and distribution technologies.
This convergence of modes has caused shifts in five major areas:

1. The joining of the telephone and computer systems;
giving rise to what has been dubbed "compunications",
marrying both telecommunications and teleprocessing.

2. The replacement of paper with electronic processing;
    witness the use of electronic account keeping and
    fund transfers by banks, the increasing use of electronic
    mail, remote publishing of magazines, newspapers by
    facsimile, telegraphic transfers of photographs, etc.

3. The increase in television services through cable, and
    the use of networks for marketing and other services,
    substituting for transportation in mass merchandising for
    instance.
4. Computerised interactive networks linking data banks to sources and terminals.

5. The expansion of education through computer-aided instruction and linkages through satellites, of such service into wider educational networks.

The qualitative change, comes, I submit, through the final convergence of all these elements focussed in key areas such as business and defence applications. For the purpose of this paper, however, I will focus on what are the effects of this complex package of technologies if they were harnessed for education, in general, and on communication education in particular.

Implications for Education in General

With the introduction of the new technologies, it is conceivable that structurally, there will be a decentralisation of learning systems. The availability of vast data bases, compiled according to different interests, subjects etc. will call into question the notion of libraries as we have known them these past several centuries. Stretching this point a little further, the concept of a university as we now know it, in their present form, will also be called into question. What systems will be favoured through...
a process of mutual accommodation depends on the credibility of various scenarios that may be sketched. Will society be finally deschooled? Will educational institutions be de-bureaucratised? Will peer-matched learning networks advocated by Ivan Illich finally come about as a feasible proposition?

As a corollary, the role of curricula will also have to be re-examined. What will be the effects of CAI on the present form of structured curricula in terms of segmented disciples, further fragmented into courses and units - "building blocks" which taken together attempt at fulfilling the various educational and social purposes of institutions of learning.

Effects that may be projected can be classified into three main categories. So far, the effects we have posited have to do with the structures of learning institutions. In two other areas, pedagogy styles and purposes, some of the likely effects can still be further isolated. As far as the style of teaching is concerned, it is not difficult to envisage that some portions of teaching tasks will allow themselves to be automated e.g. skills, training practice and simulations. The authoritarian model of the teacher and student will be modified when fellowship and mutual guidance is required in search of solutions to learning problems. The process of learning will mostly be by acculturation rather than by rote and recitation.

For those of us who earn our living in universities, and who may...
at this point begin to feel a little redundant, let me hastily add that the picture is less bleak, when the functions and purposes of these re-constituted institutions are considered. As a result of the increase in computational and memory storage capacities, one effect will be to shift the thrust of most learning towards the ability to formulate, handle and test concepts. Given the availability of data, the main activity will be in organising such data purposefully, drawing meaning and contexts from raw information. Taken to its logical extension, can we not expect an unprecedented surge in research activity? What is now a luxury, very time-consuming especially at the data collection stage, will now be a major function of human activity. Can such a high level of cerebral activity be at all feasible and imagined?

As to the functions of institutions of learning, questions may be asked if the present political purposes - status conferral, occupational mobility, the propagation of dominant ideologies - will be modified in the face of these other changes? To what extent for instance, will the merit system be modified in terms of its criteria, in terms too of its role in redressing inequality? What new disciplines will rise to match demands and needs coming out of these changes?
Implications on Communication Education

Since most of the changes occur around the central area called "communications", we should be enough of a captive audience to receive well, the fact that our discipline will be part of the wave of this envisioned future. For it to crest this wave however, it will have to respond flexibly to change its present patterns into newer mutations. Just as elsewhere in the discipline, dominant paradigms of communications have been called into question, so too must the dominant paradigm of communication education be re-examined.

Some features of the dominant paradigm may now be recalled. The structured curriculum calls for a broad liberal arts background orientation. About a third of the structured curriculum should be courses on mass communications, e.g. Media and Society etc., while the remaining third should be on skills courses like journalism, and broadcasting. In the higher levels, specialisation is permitted along the lines of media, e.g. radio, television, print or advertising/public relations. In the early 1970's those of us pioneering the field in Asia agonised over how we could indigenise this curriculum. We did execute some moves in that direction. We asked for a wider exposure to the arts and culture of the society within which our graduates were to work and operate. In this university mass communications was sited in the School of Humanities. Tried as we did, the force majeure of the paradigm did still impose itself...
on us.

The paradigm had several other features, the media was looked at, researched and studied from an American-centered viewpoint. The press was looked at as a fourth estate; research questions considered primarily what interested commercial interests, focussed primarily on effects of media and advertising, on elections and sales. Quantification, a characteristic of modern positivist educational orientation, was applied with rigour to the field of mass communications.

The coming information age has set free certain pressures which will lead logically to a re-examination of what constitutes communication education. It might be appropriate at this stage to outline first some of these pressures and their directions on communication curriculum reform.

1. Parallel to the convergence in modes of communication media, is a convergence in disciplines required for the broadened area of communication. Hardware as well as software knowledge is necessary. Knowledge of how to handle VDTs and a word processing language is as essential to a journalist, as was typing once a precondition for anyone writing for the press. Since scientific information is burgeoning, producers of documentaries can hardly have only a passing knowledge of what they are communicating.
Data analysis would be a necessary skill of any mass communicator. "Knowledge" economics will be a necessary background course for communication.

2. The newly emerging patterns of information such as the possible increase in demand for instrumental information, will require more gatekeepers for such information to be trained. With the rise in unprecedented demand for media fare, given the increase in specialised information networks, a premium will be placed on those able to efficiently turn out creative entertainment.

3. The knowledge industries spawned will require those trained in the management of such communication and information networks.

4. There is a need for general communication education training to help those wanting to be more receptive to, and to be able to put to greater use, the new information networks. The purpose of this area of training corresponds to media education courses presently taught to instil discrimination in the consumption and use of media fare.

5. For developing societies in particular, information and communication will become more than ever in the past, a strategic resource requiring policy studies and planning,
to reduce dependence, to develop autonomously and to benefit positively from the newly emerging international structures.

A Tentative Transitional Communication Curriculum

When the opportunity presented itself some one year ago here at Universiti Sains Malaysia to restructure our curriculum, we tried to tailor a genuinely autonomous program, flexible in meeting national needs, while also facing up to the coming information age.

If I may ask for your indulgence, I would like to transmit to you the gist of our proposals for your comments and discussions.

From the present one-major integrated program in mass communications, we proposed the following additional new undergraduate majors:

- Science Communications
- Management Communications
- Film & Video Communications
- Development Communications
- Film-making
- Educational Technology and Communications

At the post-graduate Master's level, we proposed two Masters degrees: one in Communication Policy and Planning, and another in Communications.
What we did basically was to expand our conception of what was involved in communications, into new purposeful communication areas which are viable, but which will also prepare us to be flexible for the coming information age.

In the ensuing discussion within the university, two proposals, science communication and Educational Technology and Communication, were deferred for various administrative reasons. The remaining proposals were accepted in principle and if all goes well, will be launched in the not too distant future. The critical mass of experience, manpower and facilities, gained in running the present major will be the springboard for the further expansion into these new areas. The core courses in the present program will form part of the core of the newer programs which will now offer additionally, specialised courses.

What are some of the educational objectives in line with the new information age? Skills courses, although still centered on media professions will eventually take advantage of CAI, and simulations encompassing a wider variety of training situations. Funds permitting, CAI programs e.g. for journalistic writing can be adapted into Bahasa Malaysia, the national language, programs. A wider range of skills training will be offered so that students may experiment with different creative formats and expressions. Video communication should allow for more creative training, owing to its lower unit cost, and faster feedback being provided in
learning situations. All these should allow a higher premium being placed on creativity. Skills courses will be tailored towards harnessing the new technologies towards horizontal communications, to help causes of environmentalists and other social groups.

Each new stream will emphasize research through requiring students to take these courses compulsorily. Within these courses, computer instruction and handling of data bases will eventually be stressed, to enhance capability to gear for the future. Knowledge from the natural sciences in so far as they will enhance understanding, will be included in the curriculum. Computer languages will be a necessary part of the subject matter.

Courses on technology policy and planning will be a new feature. It is essential not to fall into the extremes of being either a Luddite or a technology buff. Realistic assessment methods should be taught, introducing criteria important and relevant to the society's contexts. Just as essential is a healthy awareness of the quirks, limits and limitations of technology, while also recognising it for its full potential. Judgemental capability should be developed. It is important also to realise that knowledge of the cultural milieu of a technological society should be gained through research. In a society de-natured by technology, ways have to be found to teach values, and to handle norms and values in decision-making. Here the answer may lie less in strictly positivist social science than in policy oriented studies, addressing value issues.
Consciousness raising about the new revolution in communications and issues arising from it should be part and parcel of the curriculum agenda. Policy and planning courses are "natural" vehicles for such discussions. Conscientisation is needed because discussions are so often plagued by false consciousness of the real issues. While specialised information is flowing in digitalised streams transnationally in previously unimaginable volumes the subject of news flows is still being debated heatedly and contentiously. The obvious advantage of the mini-computer to individuals masks the fact that massive use and adoption of computerisation for administrative and commercial purposes pose one of the greatest threats to the privacy of individuals. The dominant communication paradigm by stressing the roles and functions of cognitive communications as a universal prescription in fostering modernisation with scant attention paid to contexts and existing structures, legitimises the global cultural implantation of values and norms innimical to indigenous cultures and national sovereign considerations by current national and international media structures. Domestically the "free lunch" of media fare serves as a vehicle to canalise (and to make palatable) commercially motivated messages which determine consumption patterns sometimes working at cross-purposes with developmental objectives. In communication education, "value free" research deflects attention from the political effects of meta-research.

Management communications, presently a viable field, will open graduates to opportunities for new careers in this field. It is
a safe bet that this emerging field will have increasing demand for trained manpower as the newer technologies come into greater and wider use. Expanding the definition of communications also allows for inclusion of areas relevant to our society such as courses on interpersonal (speech) inter-racial and inter-cultural communications, and to introduce newer branches of communications like semiotics and discourse analysis. Introducing other disciplines like management and science courses on communication is a first attempt admittedly feeble and tentative, at bringing transdisciplinary perspectives into the field. The hope is that ultimately, a holistic view of communications will emerge matching the comprehensiveness of its impact on society. Policy issues on communications for instance incorporate legal (e.g. intellectual property rights), political (who benefits, who loses?) and economics (what will be the terms of trade between data inflow and outflow in a developing country) issues, requiring completely holistic viewpoints.

Suggestions for Research

Educational issues form part of the larger issues to be addressed in research into the impact of the New Information Age on developing societies. Some such questions are, for instance, how computerisation will impact on local politics, culture and societies. Is computerisation likely to maintain the status quo, with regard to power patterns and institutions, among which are educational
institutions. Can alternative computer cultures be developed more suited to Third World environments? On communication curricula in particular, can studies be undertaken of explicit as well as hidden curriculum socialisation goals? Can studies be done to identify what social and cultural factors increase the ability to learn using the new technologies? What educational structures are best suited to socialise information, information access, use and control in future? Can studies be done of new occupational opportunities and the skills needed for these as a result of the INFOCOM technologies. An interesting experiment is being conducted by the French government which established in Paris the World Center for Microelectronics and the Human Resource. Scientists here study (and suggest) ways to change the computer's impact on peoples and societies, and particularly to encourage the transfer of the technology to Third World countries. Its research agenda is aimed at ideals such as using the computer as an agent of intellectual freedom, and to establish among poor countries a new world order based on access to information and high technology.

Postscript.

In what I have said so far, I hope I have not been overly unrealistic or visionary. In all my years of teaching, I have never been besotted by the idea of learning ever being easy. The ability to learn is not a universally high quotient; man's
ingenuity to adapt any technology to his own level and needs is
proverbial; the process of learning is much, much more than
having purely organised information or data bases. The challenge
facing educators in itself, is not any different from that of
earlier periods, except for the abundance of collected and
organised information. It is a challenge we would do well to
remind ourselves of, to correct for any undue exuberance and
optimism - a message so well encapsulated in the words of
T.S. Eliot in the poem "The Rock", which I found quoted in one
of Daniel Bell's articles on the information society.

"the endless cycle of idea and action,
Endless invention, endless experiment,
Brings knowledge of motion, but not of stillness ....
Where is the Life we have lost in living?
Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?"
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