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Enhancing learning through networked information literacy development

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Introduction

In recent times, information literacy has featured prominently on the agendas of those concerned with educational transformation. This prominence arises not only from a desire to develop capacity for life-long learning, but also from a commitment to develop an information society that will improve the quality of life for our people as a whole and enable them to participate in shaping the global information society. This paper explores the modest contribution made to this process, both theoretically and in practice, by INFOLIT, an information literacy project of the Adamastor Trust and CALICO, the Cape Library Co-operative, in the Western Cape Region.

In the present decade we have witnessed some attempts at transformation at most levels of South African society, not least in the educational arena. Typically, the key players across a range of such sectors speak a language of reconstruction, empowerment, development and knowledge production. The emphasis on information infrastructure development in Africa is fast shifting from an exclusive concern with *technical* connectivity issues to those of *content* and *capacity* to shape and exploit the networks being put into place. At a recent AFCOM conference, Global Information Infrastructure Commissioner Derek Cogburn confidently stated that in the next three to five years, Africa's connectivity challenges would be resolved (World Trade Centre, 26-30 May 1997). This statement underscored the need to focus efforts on the development of capacity for full participation in shaping and using "infostructures", for the purposes of socio-economic and political development. Implicit in this assertion is the need for Africans to develop both a consciousness *and* a self-consciousness about the role and value of information in shaping our lives and our continent.

Definitions of information literacy

Information literacy has been variously described and defined by a range of authors (Breivik, 1992; Behrens, 1993; Kirk, 1995). At the core of almost all of these definitions is the idea of the ability to "access, use and evaluate information", as defined by Christina Doyle on the basis of her Delphi Study (1992). A commentary by the American Library Association Presidential Committee on Information Literacy states that an information literate person must:

be able to recognise when information is needed and have the ability to locate, evaluate and use effectively the needed information. Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how information is organised, how to find information and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning, because they can always find the information needed of any task or decision at hand (1989).

In the Western Cape, INFOLIT has developed, through focus group discussions with key constituents in higher education, a working definition of information literacy which develop these ideas further. To begin with, INFOLIT has helped to map levels of information literacy in the region. Its contribution to the information literacy debate is significant, in that it signals the relation between information literacy on the one hand, and *knowledge production* on the other, and highlights the need to take account of various specific factors, relevant in the South African and indeed the wider African context. These include :

- prior learning experiences
- contextually specific teaching and learning
- affective issues
- access skills
- use and evaluation
- higher order cognitive skills
- student-centred learning.

The INFOLIT definition reads as follows:

information literacy refers to the ability of learners to access, use and evaluate information from different sources, in order to enhance learning, solve problems and generate new knowledge (1997: 2).

Special note is taken of the fact that in the context of South African higher education, information literacy

"develops when situational and affective factors that impinge upon the teaching and learning process are recognised by learners and teachers alike. The development of information literacy is directed towards producing independent and self-directed learners who are able to become active and responsible citizens, make information decisions in their private and public lives and contribute both to individual and national empowerment and growth" (1997: 2).

The INFOLIT Programme and Framework

INFOLIT aims to advance information literacy in the Western Cape through a discrete series of initiatives, which model new ways of enhancing student-centred learning. The primary pillars of its programme include the sponsoring of a series of pilot projects which explore information literacy activities; a needs assessment study which maps levels of information literacy among learners; an audit of programmes which do in fact advance information literacy; and the development of strategies for institutionalising information literacy.

Convergence

At the heart of INFOLIT's approach to advancing information literacy and student-centred learning is the issue of convergence. We believe that the convergence of IT and telecommunications applications on the one hand, with the expertise developed by

information workers (including librarians and IT personnel alike) and academics (including academic development specialists), on the other, provides us with a unique opportunity. Pooling resources to develop programmes and projects imparts discipline knowledge to learners, but also equips them with the competencies to explore knowledge domains confidently and independently. We do not doubt that the development of technology-enhanced, self-paced learning represents a major change in the appearance of learning space. The challenge remains to ensure that technology does *in fact* enhance learning, and that learners *do develop* the generic and transferable skills to explore worlds of information, while bringing to the learning space their own experience as an information resource which can lead to the production of new knowledge.

Content

Content and related issues of production, ownership, audience and appropriateness have become areas of primary concern in information society development. It is evident that unless the information infrastructure is utilised for purposes of development, it remains a vehicle for the propagation of cultural imperialism.

Human resource development

Using the information infrastructure for development must signal a shift from information consumerism to knowledge production. Developing capacity for participation in the information society includes requisite skills to work with information and produce new knowledge. Information literacy ought to empower people with these competencies.

Technology-enhanced learning

It is clear that new information technologies make possible new and innovative approaches to teaching and learning. Given the pressures of massification in the education system, student-centred learning can not only be enhanced through IT, but the latter becomes something of a necessary feature in the learning space to ensure participation in the global information society and access to digital information.

Networked learning

Networked learning environments which through structuring domains of knowledge by providing learners with:

- inroads into the ways in which information is organised and accessed in particular disciplines,

- access to subject-specific discussions through listserves for instance, and

- access to electronic document delivery

have prompted concern with the changing roles and cultures of those involved in transforming education. Increasingly, as the new technologies are embraced and we become involved in the wave of globalisation sweeping our environs, issues of how these can be used either to reinforce or transform unequal social relations are being posed. Within the education sector, part of the redefinition of roles relates to the new roles of the afore-mentioned academics and information workers as facilitators of learning. The relation between teachers and students is also re-defined in an attempt to identify all participants in the education system as learners and to shift away from the notion of students as empty vessels simply waiting to be filled.

With special regard to librarians, these players are having to radically reposition and reinvent themselves by transcending much of the traditional role of librarian as custodian of books and the conservative notion of information as neutral. Increasingly, information

workers are having to work with discipline and learning specialists in bringing to these coalitions expertise on the organisation and structure of knowledge domains, the sourcing of information resources (including human resources) and knowledge of search strategies and networking within and across disciplines. Without infusing these competencies into educational programmes so that learners acquire them while being inducted in a particular subject, the inputs remain add-ons which due to their dislocation from the learning context become easily lost. The integration of information into curricula thus underlines the need for information workers to work hand in glove with academics in designing coherent and interactive learning spaces and programmes.

Academics are also encouraged to work closely with information workers to ensure that on the basis of an understanding of how to access information, learners are able to critically evaluate these resources. Learners cannot develop these competencies to judge and value information in relation to a problem in isolation of abilities to navigate knowledge domains. Networked learning is however, not simply about consuming the information presented. Learners must be critical and choosy in their analysis of information in relation to their learning problem. Furthermore, the self-consciousness element of information literacy requires that learners are able to use the information to resolve their problems and to introduce new knowledge perspectives.

INFOLIT Pilot Projects

INFOLIT through a range of pilot projects explores new and improved ways of learning premised on the belief that for citizens to survive in the present decade and the coming millennium, they require information literacy. The pilots span various disciplines and ways of incorporating information literacy into the learning environment.

In selecting pilot projects to promote information literacy among the five tertiary institutions, the INFOLIT Steering Committee identified the following criteria for the ranking and prioritisation of submissions:

replicability

This related to the ability of the models developed to be replicated not only within similar faculties or schools across the region, but also across different departments.

sustainability

This criteria related to the concern that pilots should be integrated into departments and programmes and become mainstreamed and institutionally sustainable.

evaluability

The Steering Committee were concerned with the need to be able to assess the impact of the pilot on the learning experiences of students. It is envisaged that projects will report on measurable outcomes which provide a gauge of 'effectiveness'.

merit

A prime concern is the defensibility and viability of projects to succeed in meeting their objectives.

In addition, the INFOLIT Steering Committee were keen to reward efforts which displayed cross-institutional and trans-disciplinary collaboration. It was felt important to encourage this kind of partnership in light of the vision to build a learning community in the region.

The notion of integrity or demonstration of the infusion of information literacy education into curricula, courses and programmes was also strongly supported in the belief that transformative initiatives should be embedded in educational practice.

The following constitute the current range of INFOLIT pilots.

Accessing the INSPEC database to improve information literacy in Departments of Electrical Engineering and Computer Science in the region

It is proposed that enabling students to search for and find information independently will significantly empower them to become life-long learners. Funding is being granted to locate a computer system with a CD-ROM drive with the INSPEC database at all institutions to enhance access to the information base for all students. It is proposed that this facility will be fully integrated into courses and will greatly enhance students information skills in this and other fields.

The application of this project is to be determined in consultation with SLIS (the Shared Library Automated Systems of CALICO) developments.

Project Leaders: Professors G de Jager & J Greene, Department of Electrical Engineering, UCT

Time frame: 1997

Arts Infolit Materials Package

Development of a set of flexible information literacy materials which can be integrated into the curriculum, involving lecturers, Bibliographic Instruction Unit and Academic Development Centre staff at UWC has been allocated funding. The project is aimed at students in the Arts Faculty (with classes as large as 2 200) and should be of value to students in the Humanities across all the institutions. The portable set of materials would include lesson plans designed for lecturers and tutors, and materials to be given directly to students, such as handouts or worksheets. The materials will comprise a combination of video and print materials.

Project Leader: Ms Brenda Leibowitz of UWC's Academic Development Centre (leibowit@cse1.uwc.ac.za)

Time frame: 1996/1997

Building WWW-based Internet Resources to Improve Biological Information Literacy

Developing information bases to be used at both secondary and tertiary levels to ensure that IT is used in a way that promotes effective learning is a project which has been awarded funding. The project proposes to promote meaningful learning of both discipline-specific material and information skills needed to access such material. The project has two prongs: an Internet BioEd Project which is already determining needs of Biology teachers and students to develop appropriate learning materials, and the Bioinformatics Institute which seeks to promote "Web Biology". The project will be located in the Biochemistry and Botany departments at UWC and will partner with Computer Science to produce the interactive information bases. "One of the purposes of this project is to sow the seeds that will germinate into linkages and lead to the initiation of similar projects in this and other institutions".

Project Leader: Professor Derek Keats (derek@botunix.uwc.ac.za)

Time frame: 1997 - 1998

url: http://www.botany.uwc.ac.za/sci_ed/

Development of Africa: 1300AD. Research Unit for the Archaeology of Cape Town (RESUNACT).

This proposal for a project in multi-media education which could introduce all students in South African universities to information about Africa is being funded by INFOLIT. Africa: 1300AD will be developed by RESUNACT in partnership with the Mayibuye Centre at UWC, and the African Studies Library at UCT to which the product will provide an access point. The core of Africa: 1300AD will be resources delivered via CD-ROM. A secondary product will be a set of booklets in which graphics and text are conventionally printed, aimed at schools. Different aspect of Africa: 1300AD would be tailored to different audiences, including pages on Web servers.

Project Leader: Professor Martin Hall, Director of RESUNACT (martin@beattie.uct.ac.za)

Time frame: 1996/1997

Development of an Information Laboratory for the Dept. of Electrical Engineering

Funding has been allocated for making accessible and developing a series of multi-media information sources including an information base developed in a WWW environment to assist students in handling information in Electrical Engineering at Pentech.

Project Leader: Mr Anthony Staak, Director, School of Electrical and Mechanical Engineering and Information Technology, Peninsula Technikon (staak@eleceng.pentech.ac.za)

Time frame: 1996/1997

INFOLEX: an undergraduate law information literacy course

This course will integrate information literacy training into a revised undergraduate law course and be offered to students at US with a view to developing a best practise model which can be replicated at other institutions. An Information Literacy Work Group including the library service, the Law Faculty, IT personnel, the Department of Library Science and representatives from the student body will be established to steer the project.

Project Leader: Matthew Syphus (mts1@gerga.sun.ac.za)

Time-frame: 1997 - 1998

Information Society: Tools and Skills course

The School of Librarianship at UCT was given moneys to deliver a first-time, single-semester course in the Social Science Faculty to undergraduate students equipping them with transferable learning and information skills. The course content includes an introduction to information age and its impact on society. The project would also investigate how information literacy impacts on student learning by pre- and post-testing students who take the course.

Tutors from the library, i.e. librarians will provide assistance to learners in hands-on sessions in computer laboratories. A web-based course pack accessible by other institutions, will be produced on the findings of the course.

Project Leaders: Drs Karin de Jager (kdej@education.uct.ac.za) & Mary Nassimbeni

(mcn@education.uct.ac.za) School of Librarianship lecturers, UCT

Time frame: 1996

Integrated Academic Literacy Programme

Funding has been awarded for course development and delivery of an academic literacy course to replace the existing Communications course in the School of Electrical & Mechanical Engineering at Pentech. A target audience of 150 students for the pilot will expand to about 2000 first year students post-piloting. The course would investigate various ways of developing information literacy among students with a special subject focus. It aims to integrate information literacy education with an introductory exposition to engineering.

Project Leader: Dr Tahir Wood, Academic Development Unit, Peninsula Technikon (tahir@infoserv.pentech.ac.za)

Time frame: 1996/1997

Integrated First Year Experience

This Cape Technikon course already has an information literacy/retrieval component. Funding was granted to evaluate the effectiveness of a pilot programme which ran in the first semester of 1996. An impact assessment would be undertaken resulting in revision of the current module which is portable and which could be introduced at other institutions. It is believed that this evaluation will explore some of the difficulties in delivery of information literacy education.

Project Leader: Mr George Savage, Head of Academic Development Department, Cape Technikon (gsavage@huper.ctech.ac.za)

Time frame: 1996 - 1997

School of Public Health Information Literacy Programme

This programme will develop both an information resource to be used by learners in this field and a learning collection for immediate use in the Summer and Winter School programmes. It will also develop an information literacy course in the field of Health Education which will be incorporated into the programme.

Project Leader: Edgar Corrollisen

Time-frame: 1996 - 1997

Search Engines of the Internet

A set of interactive hypermedia courseware simulations are proposed for introducing students to using the Internet and retrieving relevant information in relation to their needs. The project aims to develop a set of hypermedia modules to familiarise and assist students as well as academic staff to find their way around the Internet within specific knowledge domains. The courseware is being developed to familiarise students with the concept of the virtual library and the library can use it to assist students in their course work. The final intention is to make the programmes available on the Web. This project will be developed in collaboration with SLIS, CALICO's Shared Library Information System.

Project Leader: Tony Bijker, Computer Support for Education, Academic Development Centre, UWC (tony@cse1.uwc.ac.za OR juggler@iafrican.com)

Time frame: 1998/1999

The Visual Literacy Project

This inexpensive pilot was developed by Diane Retief (lecturer in design) and Debby West (subject librarian) to promote visual literacy at the Cape Technikon. Funding was provided for course enhancement and delivery by tutors (design students) to explore a peer counselling approach to learning information literacy skills which were well integrated into the course.

Project Leader: Ms Margaret Chetwin, School of Design Lecturer, Cape Technikon.

Contact: Debby West (djw@infocats.ctech.ac.za)

Time frame: 1996

Preliminary Findings

The primary areas that these projects have explored are those of:

- developing coalitions and partnerships of academics and information workers in delivering value-added programmes

- developing content which advances information literacy appropriate to the needs of learners

- developing CD and Web-based materials which can be used across the region

- developing collaboration across institutions to deliver foundation-type programmes

The primary challenges that emerge from these experiences of developing new learning models are those of:

- Evaluation strategies which measure impact in ways that allow for adaptation of programmes are in formation

- Replication of projects: it has been found that due to the diverse nature of the higher education sector in the Western Cape, it is unfeasible simply to import materials developed for a specific audience at one site to another as the materials are incorrectly pitched and inappropriate to the needs of the "secondary" audience. In an effort to combat this problem, it is envisaged that materials which are flexible and versatile will be designed by cross-institutional groups of developers in accordance with their local needs and conditions.

- Integration and mainstreaming of projects: converting from a pilot to a programme involves careful negotiation with educational managers and institutional bureaucracies. Negotiating the process whereby pilot projects become mainstreamed is time-consuming and it must be ensured that the new ways of approaching learning continue to be adapted and developed.

- Sustainability: it is imperative that investments made in the pilot projects become part of new ways of teaching and learning so that institutions themselves assume responsibility for continuing to improve quality education.

Collaboration and partnerships: overcoming barriers to collaborative teaching and learning is a major challenge which requires adherence to the notion of developing a regional, national and/or global learning community.

Interactive learning: new models of learning require a radical departure from exclusively lecture-based courses to multi-media type learning environments in which learners are encouraged to interact with concepts and information resources to develop their understanding of a subject.

It appears that one of the imminent challenges in the area of networked learning is the design of flexible learning spaces which are able to expand as new technologies and telecommunication developments introduce value-added features which enhance learning. Thus, for example, learning could become increasingly interactive as bandwidth expands and makes possible the use of graphics and images. The development of such spaces challenges coalitions to transform lecture-based teaching and to develop interactive learning models. It calls for comprehensive or cohesive frameworks in which learners are able to move between information sources, listserves, queries, discussions, exercises and assignments to explore concepts to which they are exposed. This kind of learning ideally removes the barriers be they physical or intellectual, between the learner and the world of information s/he wishes to explore.

Implicit in this challenge is that of bridging the historical divides which exist not only between previously competitive institutions but also between compartmentalised disciplines and desegregated functions such as those of information provision and discipline induction.

A further challenge is that of developing community models which bring information literacy/ies to citizens outside of formal education institutions so that they are able to utilise these competencies in their daily lives for purposes of making more informed decisions.

Conclusion

INFOLIT is a relatively modest project, in the second year of its existence. It follows inevitably that this paper has something of the character of a report on work in progress. This applies especially to the sections describing the various pilot projects which INFOLIT is presently supporting. We recognise the possibility that some of these may not fulfil the promise which they presented at the start. We recognise the possibility that what we learn from them may not be what we expect to learn. We are, in this sense, we believe, breaking new ground.

We want to change the way in which students at the five Western Cape institutions actually study and learn. But we also have wider ambitions, and we believe that they go hand in hand with the practical work which we are doing.

We are also attempting to develop appropriate theory regarding information literacy, which is sometimes accused of being simply a fancy new name for something that information workers have always done in one way or another. We do not subscribe to this reductionist view: we think that information literacy is more than an accumulated basket of bibliographic, informatic and media skills, and that its theoretical self-consciousness places it apart from previous practices in libraries and information centres. Although we have not done more than hint at the possibilities in this paper, the information literacy movement around the world carries within it the potential to bring together widely different concepts of 'information' used by economists, librarians, cyberneticists and others, and to assist in the mainstreaming for the first time of a real theory of the economic benefits of adequate information infrastructures in human society.

Biography - Kate Whitaker is the projects officer for Infolit - the information literacy

project of the Cape Library Co-operative (CALICO) under the auspices of the Adamastor Trust. She administers the daily functions and assist with co-ordinating the 11 pilot projects and management teams involved in Infolit's initiatives.



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