Impact of ICT Revolution on the African Academic Landscape

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Introduction
The title of this paper has the following important words impact, ICTs, and African academic landscape embedded in it. For a proper understanding of the terms, we need to define these key words to show the sense in which we have used them.

In more technical terms, impact is the reportable and verifiable difference that an intervention makes in the lives of citizens. Impact is the difference that an intervention, such as the use of ICTs, is making in people's lives.

ICT is a shorthand for the computers, software, networks, satellite links and related systems that allow people to access, analyse, create, exchange and use data, information, and knowledge in ways that, until recently, were almost unimaginable. The term 'ICT’ is used almost interchangeably with the Internet. The Internet together with its applications (the most well known being the world wide web) is the infrastructure that brings together people, in different places and time zones, with multimedia tools for information, communication, data and knowledge management in order to enlarge the range of human capabilities.

The academic landscape includes the teaching and learning process, along with the educational programmes and courses and the pedagogy or methodology of teaching; the research process, including dissemination and publication; libraries and information services; and university administration and management.

Based on the meanings of the words embedded in the title, there are two multifaceted questions asked in this paper. First, given the range of the possible uses of ICTs in the academic landscape, how does one determine the difference that is attributable to ICTs in teaching, learning, and research, and the underpinnings of information services and university management? Second, how does one examine the relationship between the form of ICT, how it is used, in what context it is used, and its impact on the user?

To answer the initial question, let us first look at global trends concerning ICTs and universities. Secondly, let us review the range of ICT usage in Africa in general. We will then examine the changes brought about by the use of ICT in one case study, NetTel@Africa. To start answering the second question, we must formulate a research framework that includes an ICT Impact Assessment Tool to predict impact and to assess impact over time of the usage of various forms of ICTs for different functions in the African academic landscape.
Global Trends

The fundamental mission of universities lies in teaching, research and service. Mazrui (2003) emphasises the symbiotic relationship between a sustainable university and a society with the will to maintain sustainable development.

Universities are now expected to contribute to society by widening access to higher education, continuing professional development and applied research, contributing to local economic impact, and improving social inclusion. Reviews of experiences in the use of ICT for education (for example, UNESCO 2003) indicate the following trends:

a. ICTs are becoming an integrative part of national education policies and plans. ICTs are reflected in university strategic plans and documents derived from that plan, such as information policy plan, information master plan and information project plans;

b. The convergence of technologies has become a driving force for educational reform, making it possible for teachers and learners (and related support professionals) to connect better to information, ideas and each other via effective combinations of pedagogy and old and new technologies;

c. ICTs for teaching and learning undergo at least three phases: a substitution phase, in which traditional teaching occurs with the use of new technologies; a transition phase, in which new teaching and learning practices begin to appear as established practices and start to be questioned; and a transformation phase, in which the new technologies enable new practices;

d. With ICTs, lecturers can easily connect with lecturers and learners from other countries and with sources of teaching materials;

e. With information more readily available, learners are no longer dependent on lecturers and librarians for information. Learners are helping redefine the roles of lecturers and librarians so learners can focus on analysing information and sharpening their critical thinking skills;

f. ICTs are altering the functions of libraries and changing the role of librarians. With a wealth of learning resources on the Internet, some of which are freely available, librarians are becoming information managers or ‘cybrarians.’ These cybrarians will be computer experts and information brokers (Nentwich 2003) who will be involved in structuring and engaged in publishing and teaching;

g. Researchers are no longer faced with a lack of information, but with a glut of information. Data sharing, peer review and developing a network of contacts are no longer constrained by distance as access to e-mail, web based files, data sharing, web logs and collaborative workspaces become ubiquitous;

h. There is an increasing prominence of for-profit institutions as makers of products and providers of services (Microsoft in partnership with Blackboard; Hewlett-Packard and Placeware) or end-to-end e-learning solutions (e-college). Another example can be
seen in large corporations’ partnering with academic institutions to offer online courses (Cable and Wireless Virtual Academy in partnership with Global Technology University and Stratchclyde University in the United Kingdom), the credits for which are easily transferred across national borders. Another example is the setting up of franchise-like arrangements in which an institution (a) approves an institution (b) in another country to provide one or more of a’s programmes to students in b’s country;

i. Universities are entering into partnerships with the private sector, in order to stay current as well as to get help in maintaining the operation and financial viability of ICT-based education programmes;

j. The Internet and associated ICTs are making possible various forms of cross-border education, including trade in education. The relevance of traditional quality assurance mechanisms is being questioned, and new mechanisms for ensuring quality in transnational education are being proposed (LaRocque and Latham 2003).

Trends in Africa

The Association of African Universities (AAU), along with the World Bank, acknowledges in Revitalizing Universities in Africa (1997) a ‘declining quality of university education’ resulting from the combination of dwindling resources and growing enrolments. Yet there are positive signs! Most African institutions have started to implement plans to ensure effective leadership, transparent and accountable governance, and sound institutional management. Universities have started to involve stakeholders in the development of institutional strategic plans which are increasingly used to renegotiate relationships with government. Universities are starting to build capacity for teaching and research at an international standard in one or more academic areas crucial for their country’s economic or social advancement and to foster and reward research.

AfricaDotEdu: IT Opportunities and Higher Education in Africa (2003) highlights the challenges faced by African universities as they begin to realise the promise of ICT. Part One looks at the evolution of the Internet in Africa, the institutional policies that contribute to the development of the Internet, and the relationships among higher education, economic growth and IT. Part Two looks at regional initiatives, such as the African Virtual University, African digital libraries, community learning centres, distance learning, open content, institutional policies and e-Learning. Another set of studies examines the use of IT that is not specific to the functions of higher education institutions but has implications for developing new curriculum in higher education institutions – for example, e-commerce and e-government. Another useful resource is ICT for Teaching, Learning and Research – A Workshop for African Universities: Securing the Linchpin (2002).

a. ICTs are being reflected in university strategic plans and institutional guidelines. More and more African universities are seeing the benefits of adding e to learning. Universities like Eduardo Mondlane University (Mozambique), Makerere University (Uganda), Obafemi Awolowo University (Nigeria), and University of Dar es Salaam (Tanzania) have ICT institutional guidelines that are aligned with their university strategic plans.
b. The use of ICTs for university management of financial, personnel and educational resources is exemplified by the University of Pretoria’s Client Services Centre. The Client Services Centre includes the following services: all general enquiries regarding University of Pretoria, residence, applications, payments, study financing, student accounts, student and personnel cards, parking discs, course consultation, and a computer laboratory for all registered students to access the Virtual Campus. Another example is the University of Western Cape’s integrated information strategy, illustrated in Figure 1 below.

Figure 1. University of Western Cape’s Integrated Information Strategy

Source: Keats and Darries (2003)

c. Increasingly, library services are being digitised and viewed as a critical part of Africa’s development. Mbambo (2003) defines a digital library as including the following elements: service to a specified community, digitally presented data, organised structure or organisation, efficient information provision services, efficient control of resources, and collections (which can include objects as well as texts). Furthermore, Mbambo (2003) envisions making African scholarship available through digital libraries.

d. The range of possible uses of ICT for teaching and learning is reflected by the blurring of distinctions between traditional distance learning institutions and campus-based institutions as both start to embrace some variation of e-Learning. African universities are experimenting with blended learning or multi-modal learning. In addition to distance learning and open learning, other terms being used include Online Education, Internet Education, Computer-based Training, Computer-Mediated Communication, Computer-Assisted Instruction, Virtual Education, Cyber-Learning, and Asynchronous Learning. The meanings of these terms are starting to converge. Differences in usage have to do with place (same place, any place, on-campus, off-campus); time (same
time – synchronous or not at the same time – asynchronous); interaction (learner to computer; learner to instructor; learner to other learners); use of the computer (presentation, interactive, collaborative, generative); type of technology (text, audio, video, multimedia); and absence or presence of face-to-face interaction. During the last ten years, distance learning, also known as open learning, has moved from a peripheral form of educational delivery to ‘one that is a central pillar in many countries’ and institutions’ educational plans’ (ADEA 2002). Rumajogee (2003) summarises four generations of distance learning. The first comprises correspondence courses, with behaviourist views on teaching, lack of contact, and summative evaluation. The second consists of multimedia, which still relies on print, integrates broadcast media (radio and television) and closed-circuit audiovisual materials (audio and video cassettes), includes some face-to-face tutorials, and uses telephone counselling and, to some degree, computer software. The third generation relies on audio and video conferencing to ensure greater interactivity, but deprives learners of the flexibility of time, place and pace. The fourth-generation distance learning institution relies on the Internet and encourages the elaboration of multi-disciplinary knowledge.

Saint (1999) notes that:
1. Botswana, Cameroon, and Zambia are using a university-based Internet system to support interactive regional study centres for distance learners.
2. Tanzania, Botswana, and Zimbabwe have established new tertiary institutions wholly dedicated to distance education. The Zimbabwe Open University already enrols nearly 10,000 students in nine programmes and recently launched a Master’s degree in education for in-service teachers.
3. Côte d’Ivoire, Congo, Togo, and Benin are in various stages of setting up university-based distance education programmes.
4. Nigeria’s Centre for Distance Learning (Abuja) offers B.A. and B.S. degrees in 14 subject areas.
5. Madagascar has pioneered the use of audio cassettes for university programmes in law and the social sciences.
6. In Senegal, distance education supports teacher training and Master’s degree programmes in health and law.
7. The Confederation of Open Learning Institutions in South Africa (COLISA), led by the University of South Africa (UNISA), is developing Internet-based courseware, a web-based student-teacher interaction system, and a series of local Internet access points for students.

e. New forms of collaboration are starting to emerge among higher education institutions in Africa. Though access to ICT is not as widespread as would be optimal, African higher education institutions are embracing learning networks to respond to the challenges posed by a rapidly changing and increasingly interdependent world. Despite the tremendous policy, infrastructure, and human resources constraints, learning networks in African higher education and training sectors are similar to those emerging elsewhere, albeit smaller.
Beebe (2003) notes the following forms of transnational collaboration that are starting to emerge in Africa:

1. Remote campus branches away from the main institution are being established to provide educational programmes to students from other countries. For example, Monash University in Australia has campuses in South Africa and in Malaysia.

2. Twinning or partnership agreements between institutions in different countries are offering joint programmes. This may involve reciprocal agreements or articulation of credits between institutions. For example, the Réseau Africain de Formation à Distance (RESAFAD) programme delivers teacher-training courses from France in conjunction with universities in Benin, Burkina Faso, Guinea, Mali and Togo.

3. Cross-boundary consortia are appearing, such as the Consortium of African Schools of Information Systems (CASIS), composed of the University of Botswana, Ibadan, and Addis Ababa and the Formation à la Recherche et à la Spécialisation en Santé au Travail (FORST) programme in occupational health that links Benin, Cote d’Ivoire and three other French-speaking countries with McGill University in Canada and University of Lille in France.

4. Education business partnerships. Cisco, in partnership with African universities and donor programmes, such as the United Nations Development Programme (UNDP) and the Leland Initiative of USAID, is establishing several Regional Networking Academies in Africa—including Central African Republic, Chad, Côte d’Ivoire, Congo, Ghana, Kenya, Mali, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Togo, and Uganda.

f. Undoubtedly, e-mail has made it easier for African researchers to share information, communicate, and exchange knowledge with each other and with colleagues outside Africa. ICTs, including tools for collaborative workspaces, have made it easier to share datasets, publish web logs, and get prompt feedback as well as reviews from peers. This access to new research tools and communication systems will undeniably have an impact on the substance of research.

NetTel@Africa: A Case Study

Let us take NetTel@Africa as a case in point. NetTel@Africa is a transnational network for capacity building and knowledge sharing in ICT and telecommunications policy, regulation and applications. The overall goal of NetTel@Africa is to make the provision of ICT and telecommunications services both more efficient and available to all African citizens. Achieving this goal requires improved policy and regulation as well as increased private sector investment. NetTel@Africa aims to build the capacities of policy makers, regulators, private sector operators, consumer advocates and academic institutions. Having started with the Universities of Botswana, Dar es Salaam, Zambia, and the Universities of Fort Hare, South Africa, Western Cape and Witwatersrand in South Africa, the network now includes Makerere University; Jos, Lagos, Nigeria at Nuke, and Obafemi Awolowo in Nigeria; Eduardo Mondlane University; National University of Rwanda; Jomo Kenyatta University; and Nairobi University. Furthermore, discussions are underway with Addis Ababa University and University of Cheikh Anta Diop.

NetTel@Africa consists of four components: e-Learning Programme in ICT Policy and Regulation; Peer-to-Peer Network (P2P); Community-to-Community Programme for ICT
applications (C2C); and Research Programme. In this case study, we focus on the e-learning programme, which follows a blended learning approach and is defined as the effective teaching and learning process created by combining digital content with local community and tutor support along with global community engagement.

NetTel@Africa faces access, environmental, institutional, individual and financial barriers or challenges (Figure 1). The main delivery barriers are related to access to content, availability of a suitable technology platform, and knowledge of e-learning pedagogy. These issues have been addressed directly as part of the design of the NetTel@Africa project, and, in conjunction with addressing the institutional challenges.

Content and quality assurance. The network partners developed content for a new post-graduate diploma programme in ICT/Telecommunications Policy and Regulation, while simultaneously developing the software for an online learning management system. With an African-led course development process, quality assurance included a supportive role by U.S. academics and ICT/telecommunications practitioners/experts from Africa and the U.S. in identification of knowledge requirements, pilot testing of materials, peer review of materials, participation as online guest experts, and online mentoring. Developing content required locating and accessing large amounts of relevant information over the Internet, e-mail interaction with colleagues in Africa and the U.S., and peer review of material that is posted on the Internet.

Platform. The technical platform for NetTel is the Knowledge Environment for Web-based Learning (KEWL), an open source (Gnu GPL Licensed) platform developed at the University of the Western Cape. Although open-source itself, it is currently an ASP application running on a Windows 2000 server, but is being redeveloped as a cross-platform application in PHP. KEWL has most of the features common to commercial learning management systems and is ready to deliver online courses. All activity within KEWL is based around two main objects: user and course. When a user logs in to a KEWL site, permissions are established and appropriate links become available. The user is first in a ‘lobby’ area, but once a user enters a course all activity takes place in relation to the course. If a user moves into another course, then all activity is related to that course, thus simplifying the access to different tools. KEWL features include course management, user management, content tools, assessment, communication, group collaboration, personalisation, community tools, wikis, blogs, and administration (see Appendix 1).
Figure 1: Conceptual framework of the digital divide as barriers to delivering educational outcomes to potential learners in higher education. These barriers overlap to some degree, and are not as discrete as illustrated here.

Source: Keats and Beebe (2004)
e-Learning pedagogy. In the NetTel definition of e-Learning, one of the embedded meanings is effective teaching that requires moving away from traditional settings to a restructured setting. Table 1 below (based on Brown 1992) summarises the differences between traditional and restructured education settings.

Table 1. Differences between traditional and restructured education settings

<table>
<thead>
<tr>
<th></th>
<th>Traditional Setting</th>
<th>Restructured Setting</th>
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<tbody>
<tr>
<td>Student role</td>
<td>Store information</td>
<td>Create knowledge</td>
</tr>
<tr>
<td>Teacher role</td>
<td>Present information</td>
<td>Guide student discovery</td>
</tr>
<tr>
<td></td>
<td>Manage classroom</td>
<td>Model active learning</td>
</tr>
<tr>
<td>Curriculum</td>
<td>Breadth</td>
<td>Depth</td>
</tr>
<tr>
<td>characteristics</td>
<td>Fact retention</td>
<td>Multidisciplinary themes</td>
</tr>
<tr>
<td></td>
<td>Fragmented knowledge and disciplinary separation</td>
<td>Knowledge integration and application</td>
</tr>
<tr>
<td>Social characteristics</td>
<td>Independent learning</td>
<td>Collaborative learning</td>
</tr>
<tr>
<td>Role for technology</td>
<td>Drill and practice</td>
<td>Facilitate exploration and collaboration</td>
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<tr>
<td></td>
<td>Direct instruction</td>
<td></td>
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<tr>
<td></td>
<td>Programming</td>
<td></td>
</tr>
<tr>
<td>Assessment</td>
<td>Fact retention</td>
<td>Knowledge application</td>
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<tr>
<td></td>
<td>Performance</td>
<td>Projects</td>
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<tr>
<td></td>
<td>Portfolio</td>
<td>Portfolio</td>
</tr>
</tbody>
</table>

Source: Brown (1992)

Impact at the institutional level. The first semester of courses was held during February-July 2004, with the second semester to be held August-December 2004. The changes that are occurring at the institutional level are noteworthy, as these transformative changes represent one level of impact (see Table 2). Collaboration rather than competition among the university partners has become the priority. Partner universities have become co-developers of content rather than mere users of content developed elsewhere (old syllabi have been replaced; new material has been developed with links to digital resources). Delivery is across national borders and across time zones. Instead of knowledge being hoarded, it is shared, and the paradigm shift from a traditional to a restructured education setting is starting to manifest itself. A second level of impact analysis during the next six months will be conducted to verify that institutional changes that are taking place are reflective of the following principles of good teaching and learning practice: encouraging contacts between students and faculty, developing reciprocity and cooperation among students, using active learning techniques, giving prompt feedback, emphasising time on task, communicating high expectations, and respecting diverse talents and ways of learning. NetTel@Africa will continue to pay close attention to quality on the line benchmarks, including institutional support, curriculum and instruction (course development, teaching/learning, and course structure), student support, faculty support and evaluation, and assessment benchmarks.
Table 2. Institutional changes that are beginning to happen within institutions to make NetTel@Africa possible; these changes may be transformative in scope.

<table>
<thead>
<tr>
<th>Area</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business approach</td>
<td>Competitive</td>
<td>Cooperative</td>
</tr>
<tr>
<td>Content</td>
<td>User</td>
<td>Developer</td>
</tr>
<tr>
<td>Delivery</td>
<td>Within institution</td>
<td>Across borders</td>
</tr>
<tr>
<td>Educational processes</td>
<td>Discipline-specific</td>
<td>Multidisciplinary</td>
</tr>
<tr>
<td>Focus</td>
<td>Internal processes</td>
<td>Collaborative processes</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Restrictive</td>
<td>Flexibile</td>
</tr>
<tr>
<td>IT System</td>
<td>Defined by producer,</td>
<td>Defined by user, adaptable</td>
</tr>
<tr>
<td></td>
<td>inflexible</td>
<td></td>
</tr>
<tr>
<td>Knowledge attitudes</td>
<td>Hoarding</td>
<td>Sharing</td>
</tr>
<tr>
<td>Learning</td>
<td>Confined</td>
<td>Open</td>
</tr>
<tr>
<td>Pedagogy</td>
<td>Teacher-centred</td>
<td>Learner-centred</td>
</tr>
<tr>
<td>Perspective</td>
<td>Narrow</td>
<td>Broad</td>
</tr>
<tr>
<td>View of other institutions</td>
<td>Suspicion</td>
<td>Trust</td>
</tr>
<tr>
<td>Quality control</td>
<td>Internal</td>
<td>Shared</td>
</tr>
</tbody>
</table>

Source: Keats and Beebe (2004)

The ultimate impact of interest is improved educational outcomes. Based on Kirkpatrick’s four-level model of evaluation (1994), NetTel is monitoring: Level One – Reaction, Level Two – Learning, and, Level Three – Behaviour. From the students who participated in the Semester 1 courses, reactions are generally favourable about the e-Learning experience, the quality of the content, the delivery platform, and the perceived value and transferability to the workplace. The lecturers and students agree about the need to improve interaction with one another through setting clear standards for prompt feedback, emphasising time on tasks, respecting deadlines, making better use of the discussion forums, and e-mailing lecturers when learning materials or exercises are not clear. Overall, the experience has been positive. One contextual footnote is that the students are also full-time working adults from government ministries, regulatory agencies, non-governmental organisations and universities which may facilitate looking at Kirkpatrick’s Level Four – Results which are aligned with improvements in ICT/telecommunications policy, improvements in investments in the sector, and improvements in the performance in the higher education sector.
Research Challenge: Determining Impact of ICTs on the African Academic Landscape

In the discussion above, what is apparent is the need for a research framework that will examine the relationship between technology use (the form of ICT, how it is used, in what context it is used), educational reforms, and any impact on the user (empowerment of teachers, changes in teaching and learning processes, and student learning). Moreover, it is important to consider the non-instructional uses of ICTs (university administration and management) and the digital library and information services within the broader environment in which education operates.

There are at least two tools that could serve as a foundation for formulating such a research framework: AAU’s Assessment of ICT Maturity Tool (2002), and UNESCO/Bangkok’s Manual for Pilot Testing the Use of Indicators to Assess Impact of ICT Use in Education (2003).

AAU’s Assessment of ICT Maturity Tool suggests the use of a matrix that looks at (a) nine sets of ICT variables, based on the Quality on the Line: Benchmarks for Success in Internet Based Distance Education (2003) and (b) five stages of higher education institutions’ (HEI’s) ICT development, based on the CEO Forum’s STaR Chart assessment (2000) and the research by the Apple Classrooms of Tomorrow.

The ICT variables suggested by AAU are:

a. Strategic planning and performance monitoring tools: availability of university strategic plan, derived information policy plan, derived information master plan, and derived information project plans;
b. ICT infrastructure: type of infrastructure as well as accessibility and usage patterns.
c. ICT organisational (support) infrastructure: staff responsibilities in technical as well as functional areas;
d. ICT financing: funding for ICT internally and via fundraising; with distinction within/between (?) budget votes and/or (?) budget line items;
e. Application of ICT in teaching and learning: teaching objective for using ICT, professional development of academic (teaching) staff, technology access and usage patterns of academic staff, and technology access and usage patterns of students.
f. Application of ICT in research: research objective of academic staff and students for using ICT;
g. Application of ICT in academic information services (library): extent of access to online public access catalogue, services in academic information management, and training in academic information management;
h. Application of ICT in administration and management: extent of ICT application for administration and management;
i. Training, Research and Development in ICT: training for ICT human resources development (workforce and leaders).

The suggested stages of technology development are:

a. Entry stage: HEIs teach students to use the technology;
b. Adoption stage: HEIs use technology to support traditional instruction;
c. Adaptation stage: HEIs use technology to enrich curriculum;
d. Appropriation stage: HEIs integrate technology and use it for its unique capabilities;
e. Invention stage: HEIs are prepared to develop entirely new learning environments that use technology as a flexible tool; learning becomes collaborative, interactive, and customised.

UNESCO’s Manual for Pilot Testing the Use of Indicators to Assess Impact of ICT Use in Education (2003) suggests monitoring the following indicators: the types of ICTs and their accessibility, the extent and nature of professional development efforts, changes in teaching/learning practices, and improvement in what is learned by the students.

By putting together a research framework that will help universities assess the impact of ICTs in their teaching, learning and research, African universities can better report on the difference that ICT is making in student performance and can better exchange knowledge and share quality higher education across borders.

Finally, with emerging issues brought about by ICTs, such as trade in education and transborder education, there is also a need to do policy research.

Conclusion

The increasing speed and dissemination of ICT is already showing that African universities and learning and research communities are no longer strictly local. They have gone global. Nevertheless, even in a global neighbourhood, and as demonstrated by the CODESRIA Conference on Electronic Publishing and Dissemination in September 2004, it is necessary that key players come together as a community and hold a conversation with a shared sense of participation and responsibility. As global educators and leaders, we have a responsibility to continually ask how best to provide leadership in how people interact with technology; advocate for free and open content and open source to make all the knowledge and ideas in the world available to everyone; link learning communities from Africa with communities of practice from anywhere in the world; and advocate for improved access to the Internet and associated technologies, so that everyone can access, acquire, and utilise knowledge in a way that will make a difference in ordinary people’s lives.
References


Keats, Derek and Maria Beebe, 2004, ‘Addressing Digital Divide Issues in a Partially Online Masters Programme in Africa: The NetTel@Africa Experience.’ Finland IEEE Conference.


Appendix 1: KEWL

Welcome to the NetTel Student Information Centre!

The NetTel Student Information Centre provides detailed information to help you (students, faculty, partners, and guests) better utilize the "nettel.nettel.org" web resources. This Information Centre will be built over time to better meet the needs of users. If you have any suggestions, please let us know via the discussion forum. Currently, the Information Centre contains the following areas:

- **Chapter One: Overview of NetTel**
  - Consolidated Academic Calendar for Current NetTel Semester
  - List of Current Semesters
  - List of NetTel Faculties
  - Explanation of netTel
  - Using Discussion Forums
  - Structure Group Activities

- **Chapter Two: Student Guide to using KEWL**
  - What is KEWL
  - Accessing KEWL
  - Finding your course
  - Navigation
  - Basic Features

- **Chapter Three: Final Graduate Diploma Catalogue**
  - Introduction
  - Components
  - Training Programme Overview
  - Part One: Overview of Human Scientific Process
  - Part Two: Enhancing a NetTel Student
  - Part Three: Choosing a Home Institution
  - Part Four: Enrolling as a Course
  - Part Five: Understanding the Existing Policies
  - Part Six: Accessing Learning Resources
  - Part Seven: Final Outcomes
  - Part Three: NetTel Final Courses