Annexure 11 - The Procurement Options report in respect of the Feasibility Study for an e-Education Initiative in South Africa

Contents

Project Terms, Definitions and Abbreviations

Terms and Definitions	Meaning
Adaptation level	The educator is able to use ICT to develop and/or evaluate school or FET College ICT Development Plans. He/she stimulates ICT use in his/her environment, and. is able to reflect critically on how ICT changes the leadership and teaching and learning styles and to use ICT systems for management, administration, teaching, and learning.
Administrators	People at any location who are concerned with the administrative activities of an institution. Educators are included, for the purpose of this definition, to the extent that they provide information to administrative systems (for example, SASAMS) in an administrative office or staff room.
Applications	The term application is a shorter form of application programme. An application programme is a programme designed to perform a specific function.
Architecture framework	Architecture framework is more than just providing ICT infrastructure to schools and FET Colleges, but rather takes a holistic view of what services should be provided, how these services are provided, the underlying technology on which these services are built and interact, how should the services be accessed by the various role players (administrators managers, educators, and learners) and what standards should govern the implementation of each of these components (services, technology, and role players).
Backbone	The Wide Area Network (WAN) comprises the Backbone and Last Miles. Each entity is connected by a 'Last Mile' to the Backbone which is that part of a WAN that is shared by all of the entities.
Bandwidth	The amount of data that can be carried from one point to another in a given time (usually a second).
Basic Readiness	Means the basic conditions that need to be met at each school or FET College site before rollout of ICT infrastructure can commence at a site The basic conditions address items such as: • Appropriate documentation and policies on standard operating procedures; • Existing systems, including SASAMS; • Support structures and manuals; • Training requirements; • Human resource implementation capacity; • Civil infrastructure (such as school buildings, electricity, water, sanitation, and road access); • Physical security for ICT equipment; • 'Last-mile' access; and • Communication and change management.
Building Block or Technical Building Blocks	An ICT or physical infrastructure component that is part of an Architecture Layer.
Building security	Building security is directed at control of the movement of persons and moveable assets in and out of building(s) and within buildings(s) on an institution's site.
Computer	Either a desktop computer or a laptop.
Connectivity	The infrastructure and services required to allow the end-user devices to communicate successfully with the ICT infrastructure, and therefore allow role players to access the various applications and services to which they require access.

Terms and Definitions	Meaning
Creative Commons licence	Creative Commons licences allow authors to retain certain rights while granting other rights to users (particularly the right to make copies of content produced).
Delivery Option	Procurement and/or implementation method of services and products aimed at accomplishing the rollout of an identified service delivery option from the Options Analysis as determined by the Institution.
Department	The national Department of Education or provincial Department(s) of Education, as the context may require.
Dependencies	Items on which success of the e-Education Initiative is contingent. Dependencies help to delineate clearly which aspects of achieving the intended Impact Statement fall within the e-Education Initiative and which will be the responsibility of other parts of the Institution.
Desktop/ Desktop computer	A personal computer that is designed to fit conveniently on top of a typical office desk.
Educational content	Content refers to the learning and teaching materials that support delivery and interpretation of the curriculum. 'Educational content' denotes all materials that are designed or suitable to support teaching and learning directly.
ICT Development Plan	All schools have developed, implemented, and are continually refining rolling three-year ICT integration plans. A structure for this plan has been agreed which is representative of different interests and includes at least the following elements: • A long-term vision for use of ICT in the school; • Codes of conduct for ICT usage by learners, educators, school management and administration, and the wider community; • Curriculum policies outlining how the school intends to use ICT to support teaching across grades and learning areas/subjects; • A detailed assessment of ICT requirements; • Timetables outlining how the ICT resource will be integrated into the school day, and what levels of access will be made available to which grades of learners; • Clear policies on extended afternoon, weekend, and school holiday use of ICT, accompanied by plans to provide incentives to teachers to enable this extended use; • Policies on community use of ICT; • School strategies to acquire further ICT as appropriate; • Professional development strategies on use and integration of ICT in educational, management, and administrative tasks; • School strategies to cover operating costs of ICT; • Defined roles for school ICT coordinators and support staff and their backups; • Guidelines on ICT application and educational content acquisition; • Strategies for ICT support and maintenance; • Strategy for ICT renewal; and • Strategies for monitoring and evaluation of implementation of the e-Education Initiative.

Terms and Definitions	Meaning
Educator	The term educator is being used, as it is defined in government policy, to refer to the full spectrum of employees engaged in schooling and the FET College system. This is in line with the South African Council of Educators Act, 2000. In this Act an educator is defined as any person appointed: in terms of the Employment of Educators Act, 1998 (Act No.760f 1998); in terms of the South African Schools Act, 1996 (Act No. 84 of 1996); in an independent school; in terms of the Further Education and Training Act, 1998 (Act No. 98 of 1998); at a further education and training institution; at an adult learning centre, and 'who teaches, educates or trains other persons or who provides professional educational services, including professional therapy and educational psychological services, at an institution'.
e-Education (as defined in the White Paper)	The concept of e-Education revolves around the use of ICT to accelerate the achievement of national education goals. It is about connecting learners and educators to each other and to professional support services, and providing platforms for learning. It will connect learners and teachers to better information, ideas, and one another via effective combinations of pedagogy and technology in support of educational reform. It supports larger systematic, pedagogical, curricular, and assessment reforms that facilitate improved education and improved use of educational resources such as ICT.
e-Education Initiative	The objective of the Institution to implement e-Education in Public Schools and FET Colleges. The term Initiative is being used when referring to the Feasibility study as a project is in a sense finite in time and investment. Initiative is used as the intentions of the Institution are on-going and continuously changing to be as current as possible, which is captured in the use of the word 'initiative'.
E-Learning	Learning that is facilitated by use of digital tools and content.
Email	A process of sending text messages in electronic form.
End-user computing	A group of approaches to computing that aims to integrate end users better into the computing environment or that attempt to realize the potential for high-end computing to perform in a trustworthy manner in solving problems of the highest order.
e-Readiness	Before implementation of school or FET College ICT Development Plans can commence, certain conditions, as set out in Section 9 of the Options Analysis, need to be met at each school or FET College site.
FET College	Means a public further education and training institution that is established, declared or registered under the Further Education and Training Act, number 16 of 2006, but does not include: (a) a school offering further education and training programmes under the South African Schools Act; or (b) a college under the authority of a government department other than the Department of Education; or (c) a private further and training institution (meaning the Member of Executive Council does not provide funds to the institution appropriated by the provincial legislature). It includes all learning and training programmes leading to qualifications at levels 2 to 4 of the National Qualifications Framework or such further education and training levels determined by SAQA and contemplated in the South African Qualifications Authority Act, 1995 (Act No. 58 of 1995), which levels are above general education but below higher education.

Terms and Definitions	Meaning
ICT Laboratory	A learning space/ classroom within a school specifically adapted for installation of a large number of computers (between 25 and 45), also referred to as a computer room or an ICT laboratory.
Impact	The extent to which investment in the e-Education Initiative will affect various systems within the Institution.
Impact Statement	A statement, in broad terms, of • a 'primary' impact that is expected to arise from investment in e-Education in respect of (i) enhancing its logistics and operations; (ii) building educators' capacity to teach effectively; and (iii) providing all learners access to quality education; or • a 'secondary' or ancillary impact that is expected to flow as an indirect consequence of investment in e-Education.
Information and Communication Technologies (ICT) (as defined in the White Paper)	ICT represents the union of information technology and communication technology. ICT is the combination of hardware, software, and means of communication that brings people together and that enable the processing, management and exchange of data, information and knowledge in order to expand the range of human capabilities.
Information Technology (IT) (as defined in the White Paper)	Electronic display, processing, and storage of information, but not necessarily the transmission of the information. IT carries strong historical associations with enterprise data processing and centralized computer services.
Internet	A worldwide, publicly accessible series of interconnected computer networks.
Laptop	An end-user computing device that is designed to be easily transportable and usable in any location. Otherwise known as a 'notebook'.
Last mile	The connectivity options that may be used to connect each school or FET College to the nearest WAN Backbone connection point.
Local Area Network (LAN)	Comprised of the following components: • Routers/Switches, including one, some or all of: – For wired networks, Ethernet Cat 5; – For wireless networks, 802.11b, g or n; and – For power line communication (PLC) networks. • Network server(s). These computing devices provide facilities that are shared by authorised users. Servers may include mail servers, database servers, application servers and the like.
Multifunctional devices	Devices that can be attached to a PC or to a network that can perform a range of functions, for example: faxing, printing, scanning, and copying. Also known as an 'all-in-one'.
Multimedia devices	Devices that can capture or output various media in combination, for example, sound, and video.
Needs Analysis	The first stage of the Feasibility Study which clearly argues the case for investing in the e-Education Initiative to assist the Institution to deliver its core services and meet its needs.
Network	An interconnected system of computers.
Network servers	A server that is designed and/or configured to monitor and control flows of data through a network.
Norms and Standards	Guidelines typically associated with current and prevailing policy and legislation within the applicable environment.
Open source software	Programmes whose licenses give users the freedom to run the programme for any purpose, to study and modify the programme, and to redistribute copies of either the original or modified programme (without having to pay royalties to previous developers).

Terms and Definitions	Meaning
Operating systems	The operating system is a programme. The programme, after being initially loaded into the computer, manages all the tasks and resources on your computer.
Option(s) or model(s)	A range of possible service delivery solutions/models for meeting the identified Outputs for the e-Education Initiative.
Options Analysis	The second stage of the Feasibility Study, setting out the range of possible options for delivering the required Outputs (as defined in the Needs Analysis) in respect of the e-Education Initiative, allowing the Institution to weigh up various options and make a choice.
Output	The specific, direct achievements or consequences expected to result from making judicious investments in the e-Education Initiative.
Peripherals	Any computer device that is not part of the essential computer.
Personal computer or PC	A personal computer may be a home computer, or may be found in an office, often connected to a local area network. The distinguishing characteristic is that the computer is used only (or mostly) by one person at a time, in a very interactive fashion, with no significant delay between an operator action and response by the computer. This is opposite to the batch processing or time-sharing models which allowed large expensive systems to be used by many people, usually at the same time.
Pillar	Any one of the six identified areas, expected to benefit due to investment in the e-Education Initiative, outlined below: • Infrastructure – Establish an ICT presence in public schools and FET Colleges; • Network connectivity – Institutions are connected, have access to the internet and communicate electronically; • Professional development – Build teachers' and managers' leadership, confidence and competence in the use of ICT; • Curriculum integration – Institutions are using education content of high quality; • Research, monitoring and evaluation; and • Human resource systems – Build an education and training system to support the integration of ICT in teaching and learning.
Private Public Partnership (PPP) standardization	The *Standardized Public Private Partnership Provisions* issued as National Treasury PPP Practice Note 1 of 2004, dated 11 March 2004.
Principal	Could be a school principal, an FET College campus manager, or an FET College principal.
Printing and Multi-purpose device(s)	Printing device(s) can be: slow, medium or high-speed; monochrome or colour; and inkjet or laser printers. Printers can be single purpose or multi-purpose devices; multi-purpose devices can provide additional scanning, photocopying and/or facsimile capabilities. Printers can be linked to single end-user computing devices or shared among multiple end-users over a network.
Project	The Institution is considering various models for implementing the Pillars of e-Education, amongst others a PPP model. The national Department of Education has appointed a Transaction Advisor to assist it in exploring the feasibility of procuring the required services and infrastructure by way of a PPP or alternative method.
Proprietary software	Computer software with restrictions on copying and modifying placed on it by the creator or distributor.

Terms and Definitions	Meaning
School	A public school means an institution which enrols learners, for education purposes, in one or more grades between grade zero and grade twelve, as defined in the Schools Act, number 84 of 1996, and where the Member of Executive Council provide funds appropriated for this purpose by the provincial legislature.
Secure Network	A network (whether a standalone network or a virtual network within the Internet), which is only accessible to Authorized Users.
Service Delivery Option(s)	The service delivery options set out the range of possible Options for delivering the required Outputs (as defined in the Needs Analysis). It should be noted that service delivery options do not include decision about the best way to procure the preferred service delivery option(s).
Site	A public school or FET College or FET College campus, as the case may be.
Site security	This is concerned with the control of the movement of persons and moveable assets across the perimeter boundary of the particular site.
Software	Various types of software can be anticipated: • Operating system software for end-user computing device(s), and networked servers, etc. • Network Management Software. This is software that is used to monitor, configure and manage the LAN, as well as access by the users of the LAN. • Application software directly or indirectly providing functional capabilities to end-users. For example: generic office software (such as word-processing and spreadsheets); departmental administration systems such as SASAMS and learning management software (planning tools, examination support systems, browsers, etc.) Whilst not immediately required for the support of logistic and administration, future phases of ICT deployment in institutions will use other types of application software (for example, educational content management, learner tools). In some instances, this software will share the same ICT infrastructure as will be used for the support of enhanced logistics and operations. For this reason, deployment of ICT infrastructure enhanced logistics and operations must give consideration to such future requirements.
Software standardization	The process by which the full range of software options for operating systems, utilities, applications, and services is rationalized with the objective of providing a limited number of options that are able to interoperate and provide the required functionality.
The Feasibility Study	The national Department of Education is conducting a feasibility study in terms of Treasury Regulation 16 (dealing with PPPs) to the PFMA in respect of the e-Education Initiative. The purpose of the feasibility study is to determine whether the e-Education Initiative is in the best interest of the Institution.
The Institution	Collectively, the national Department of Education and the nine provincial Departments of Education.
Thutong Portal	South Africa's education portal.
Transaction Advisor	The transaction advisory team consisting of the lead member, KPMG Services (Pty) Ltd, and its main subcontractors Ledwaba Mazwai Attorneys, Lendar Projects (Pty) Ltd, Neil Butcher & Associates and Macabee Risk Solutions (Pty) Ltd The role of the Transaction Advisor is to conduct a Feasibility Study, in accordance with Treasury Regulation 16 to the PFMA.

Terms and Definitions	Meaning
Transversal systems	A system that is used generally across an environment. SA government transversal systems (for example, the Basic Accounting System – BAS) are operated and supported by the State Information Technology Agency (SITA). Institutional transversal systems are those operated and supported by the Institution.
Treasury Regulations	The National Treasury Regulations published in Government Gazette No 23788 of March, 2005.
Virtual Private Network (VPNs)	A communications network tunnelled through another network, and dedicated for a specific network.
Wide Area Network (WAN)	General term referring to a large network spanning a country or around the world.
Wireless	Refers to the type of broadband connection where information is sent from and arrives at a computer through transmission towers.

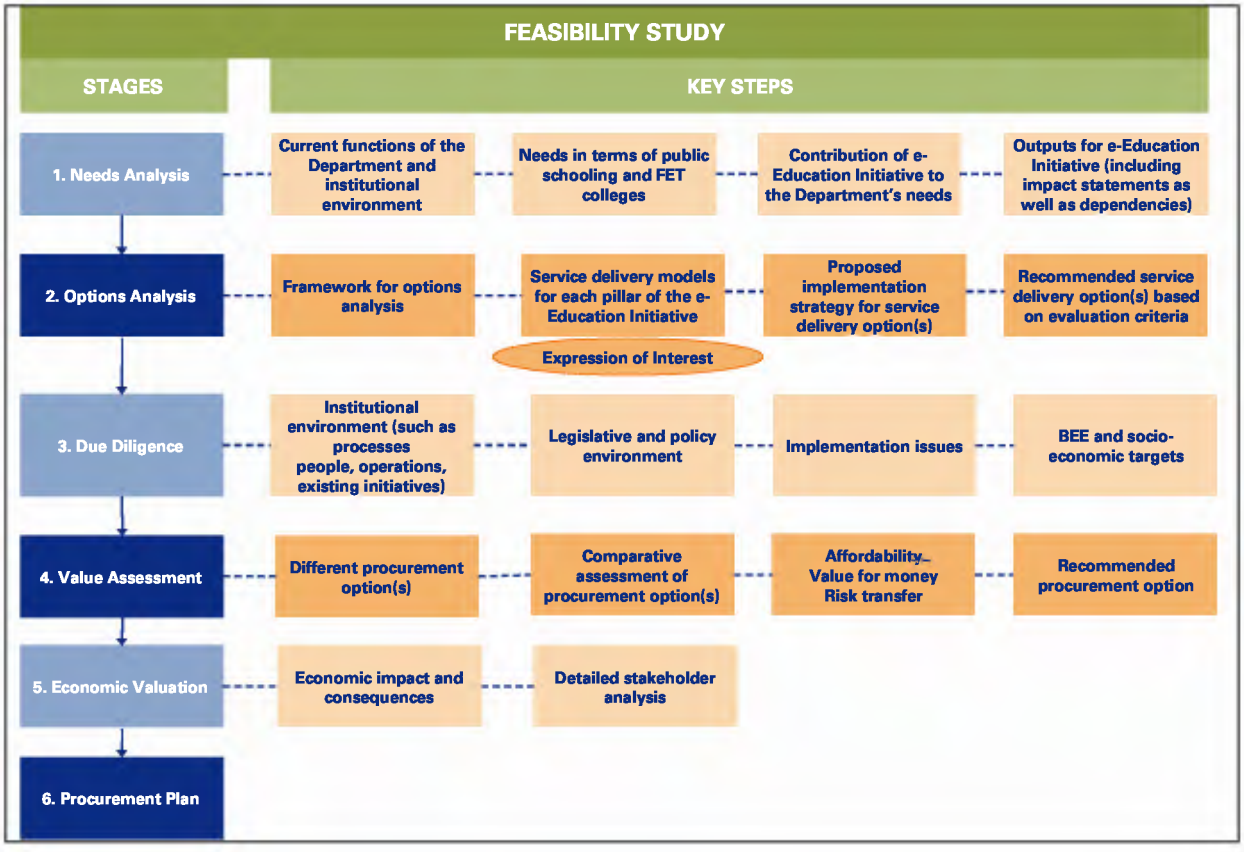
1 Introduction

1.1 Placing the Procurement Options Report

The national Department of Education is conducting a feasibility study in terms of Treasury Regulation 16 to the Public Finance Management Act, 1999 (PFMA) in respect of the e-Education Initiative. The purpose of the Feasibility Study is to determine whether the e-Education Initiative is in the best interest of the Institution. To this end, the Feasibility Study must:

1) Explain the strategic and operational benefits of the proposed e-Education Initiative for the Institution in terms of its strategic objectives and government policy;
2) Describe the specific terms of the e-Education Initiative in terms of the nature and extent of the Institutional functions, both legally and by nature, to be performed either by the Institution or by a private party;
3) Set out the legislative and regulatory framework applicable to the e-Education Initiative;
4) In relation to any financial commitment to be incurred, demonstrate the affordability of the e-Education Initiative for the Institution;
5) Set out the proposed allocation of financial, technical and operational risk between the Institution and a private party;
6) Demonstrate the anticipated value for money to be achieved; and
7) Explain the capacity of the Institution to procure, implement, manage, enforce, monitor and report on the e-Education Initiative.

The figure below shows the stages of the Feasibility Study:



Stage 1: Needs Analysis
A comprehensive Needs Analysis has been completed, which clearly argued the case for investing in the e-Education Initiative to assist the Institution to deliver its core services and meet its needs. The Needs Analysis defined a high-level set of Impact Statements, which define in broad terms the impact that is expected from investment in e-Education. It also presented a set of Outputs for the proposed e-Education Initiative, which indicate what will be achieved through suitable investment in the e-Education Initiative, as well as Dependencies on which success of the e-Education Initiative is contingent. The Dependencies help to delineate clearly which aspects of achieving the intended Impact Statements fall within the e-Education Initiative and which will be the responsibility of other parts of the Institution.

Stage 2: Options Analysis
The Options Analysis set out the range of possible options for delivering the required Outputs (as defined in the Needs Analysis), allowing the Institution to weigh up various service delivery options and make a choice. It should be noted that, in an Options Analysis, the Institution does not make the decision about the best way to procure the preferred service delivery option(s). In the Options Analysis, the Institution, supported by the Transaction Advisor, identifies and evaluates various potential options for meeting the Institution's needs to deliver the e-Education Initiative. After consideration of various factors to be set out in the due diligence and value assessment stages, the Institution will make a decision about the best procurement option (Private Public Partnership – PPP – or alternative).

Stage 3: Due Diligence
The Due Diligence stage is an extension of the Options Analysis stage, which aims to uncover any issues in the preferred service delivery option(s) that may significantly impact on the proposed e-Education Initiative. This included:

- A comprehensive legal due diligence of the preferred service delivery option(s) to ensure that all foreseeable legal requirements are met for the development and implementation of the e-Education Initiative (see section 1.3).
- A technical and educational due diligence of the preferred service delivery option(s) to uncover any problems that may impact on the e-Education Initiative's affordability and value for money, or cause regulatory delays at implementation. This focuses particularly on the following issues:
  - Review and validation of ICT options for the 'push' strategy of the e-Education Initiative, including a special focus on thin, fat and smart client networks;
  - Review of environmental considerations pertaining to the e-Education Initiatives, together with recommendations on how to handle these;
  - Comparison of FOSS and proprietary software options;
  - A model to project the number of ICT Laboratories required by schools to offer Computer Applications Technology (CAT) and/or Information Technology (IT) at FET level in schools, which were specifically requested to be included in the 'push' strategy of the e-Education Initiative by the Institution; and
  - Review of connectivity options and presentation of associated specifications (including specifications for aspects of the LAN).

Stage 4: Value Assessment
This is a pivotal stage of the feasibility study. It enables the Institution to determine the best procurement choice for the e-Education Initiative. The three tests, in respect of procurement options prescribed by Treasury Regulation 16 to the PFMA are:

- Affordability;

- Appropriate risk transfer to a private party; and
- Value for money.

Stage 5: Economic Valuation
The Economic Valuation will give a clear economic rationale for the e-Education Initiative, identify and quantify the economic consequences of all financial flows and other impacts on the e-Education Initiative, identify the opportunity cost of undertaking the e-Education Initiative by creating a no-investment scenario, and update the Stakeholder Analysis that has been done as part of the Needs Analysis.

Stage 6: Procurement plan
The Procurement Plan will demonstrate whether the Institution has the necessary capacity and budget to undertake the procurement of the e-Education Initiative, as well as indicate the appropriate governance structure for procuring and implementing the e-Education Initiative.

1.2 Purpose of the Procurement Options Report

The purpose of the Procurement Options report is to explore options available to the Institution to procure its preferred solution option (as set out in the Options Analysis Report) and to make recommendations to the Institution in this regard. The two key procurement options that need to be explored in terms of Treasury Regulation 16 are:
1) The Institution acquiring the assets and performing the related services itself; and
2) A private party undertaking procurement on behalf of the Institution.
The choice of whether or not to procure the solution option as a PPP can only be made after this stage.

To accomplish this, the Procurement Options report has been structured according to the Pillars of the e-Education Initiative being: ICT infrastructure; connectivity; professional development; curriculum and content; and monitoring, evaluation, and research.

1.3 Legal Due Diligence

A legal due diligence report has been prepared as a supplement to the due diligence legal report (as per the Due Diligence Report), the purpose of which is to respond to issues which have arisen in respect of the procurement options of the e-Education Initiative.

The following issues are covered in the supplementary legal due diligence report:
1) The determination of mandatory services of State Information Technology Agency ('SITA') in light of the State Information Technology Agency Act, 88 of 1998 ('the SITA Act');
2) The role of SITA in the e-Education Initiative procurement/implementation structure;
3) The role of public schools in the e-Education Initiative procurement/implementation structure;
4) The possibility of finance lease procurement outside of Regulation 16 of the Public Finance Management Act, 1999 (Act 1 of 1999) ('the PFMA');
5) Consideration of procurement options for network connectivity;
6) The scope of the Universal Service and Access Agency of South Africa ('USAASA').

The detailed supplementary legal Due Diligence is attached as to Annexure A of this report.

1.4 Introduction to Procurement Options

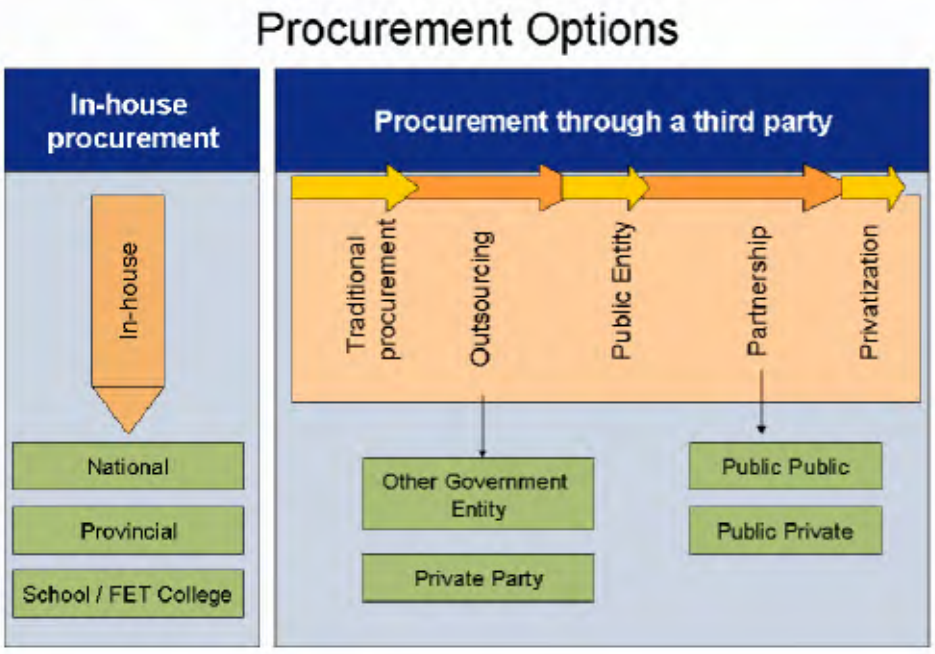
1.4.1 Introduction

The phrase 'Procurement Options' is used to describe the process by which the Institution will achieve delivery of the e-Education Initiative. The choice of procurement option depends on the nature and objectives of the Initiative, and the route that offers the best potential for the delivery of value for money and risk transfer.

Key factors that affect the procurement choice are:
1) Nature of the product/services;
2) Legal environment;
3) Schedule;
4) Cost certainty;
5) Predictability vs. uncertainty;
6) Competition and market conditions;
7) Apportionment of risk; and
8) Managing the process.

Procurement options can broadly be divided into two categories, being:
1) In-house procurement; and
2) Procurement through a third party.

Each of the above two categories have various sub-options as illustrated below:



Specific circumstances and needs of the e-Education Initiative generally dictate how a procurement relationship should be defined and consequently the type of procurement option the Institution would choose.

The key difference in moving from the left side to the right side of the diagram above in respect of third party procurement is the increased level of risk transfer achieved per mechanism. In

privatization, for example, one has full risk transfer, compared to outsourcing where generally limited risk transfer takes place.

For all third party procurements, a service level agreement (SLA) would be necessary. The SLA would accommodate the terms and conditions of the relationship between the parties, define appropriate levels of service delivery, and provide mechanisms to ensure performance measurement.

It is worth noting, as per Treasury Regulation 16, and more specifically in terms of the definition of the word 'private party' that PPPs in South Africa exclude a Public-Public Partnership. Partnerships can be split into a Public-Private Partnership ('PPP') and a Public-Public Partnership option. The basic difference between these two options is that, with a PPP, the service provider would be from the private sector, whereas, with a Public-Public Partnership, the service provider would be from the public sector. Another significant difference is that, with a Public-Public Partnership, the risk remains with Government. It should further be noted that the two forms of Partnership otherwise share the same legal principles, but partnering with a public sector service provider would not imply the same procurement principles.

The different procurement options, with their associated challenges and benefits, are discussed in more detail below.

1.4.2 In-house Procurement Options

In-house procurement entails that the responsibility for funding, implementing, operating, and maintaining the e-Education Initiative remains with the Institution. However, this may be done in conjunction with other procurement options, such as traditional procurement contracts, or outsourcing, as is currently the case.

Benefits of this procurement option are that the skilled, knowledgeable workforce that has significant experience of local delivery is retained (although this benefit can also be achieved with other procurement options). Also, the Institution retains complete control over the service delivery and has no external constraints (for example, third party agreements) that may inhibit its reaction to changing needs affecting the business. Finally, all assets procured through this procurement choice belong to the Institution.

Challenges that this procurement option face are that the Institution carries all the risks. A major constraint is that the Institution cannot borrow funding or sign finance leases with a focus on providing value for money in the short-term. This often results in higher cost over the lifetime of projects. In addition, bringing innovation to the service delivery is limited.
There are three parties that could take responsibility for the in-house procurement, being:
1) The national Department of Education;
2) Provincial Departments of Education (including district/regional offices); or
3) Each School/ FET College.

Depending on which party is responsible, different procurement rules and legislation may be applicable.

It should be noted that, as a more decentralized approach is followed, the benefits of economies of skill, scale, and standardization are reduced. Decentralization may, however, provide improved alignment to local conditions.

Funding is obtained through a combination of the budget, by way of grants, donor funding, and in the case of section 21 schools and FET Colleges fees collected.

1.4.3 Procurement Options through a Third Party

1.4.3.1 Outsourcing

Outsourcing involves transfer of responsibility from the Institution to a private party. Management of this new arrangement is through a contract that should include an SLA. Outsourcing can be undertaken to varying degrees, ranging from total outsourcing to selective outsourcing. Total outsourcing may involve dismantling entire departments or divisions and transferring the employees, facilities, equipment, and complete responsibility for a product or function to a private party. By contrast, selective outsourcing may target specific services or products that can be handled more efficiently by an external party.

Outsourcing can be undertaken on a needs basis, and is normally used for short- to medium-term projects. In the public sector, three years tends to be the maximum agreement term. Funding is obtained through a combination of budget, grants, and donor funding. Benefits are that the Institution obtains access to skills and services more flexibly, more quickly, and, potentially, more inexpensively than by developing and maintaining its own capacity. Limited transfer of risk to the outsourcer occurs. Assets used by the Institution under this procurement option may belong to the Institution or the outsourcer depending on the nature of the agreement.

Challenges this procurement option face are that limited risk transfer takes place and that the Institution's funding options are limited in terms of external borrowings and entering into long-term contracts. In addition, outsourcing agreements may limit the Institution's ability to react quickly to changing needs.

Outsourcing can be grouped into the following models:

1) Process Outsourcing (PO) – in the PO model, relevant resources (including staff) and assets for the performance of business processes are often, but not always, transferred from the Institution to the private party.

2) Service Provider (SP) – in the SP model, suppliers concentrate on providing selected similar services or products for multiple clients. Services are provided using supplier assets and staff. No Institutional assets or staff are transferred. Each supplier has a particular focus and/or point of entry to the market, with a wide range of pricing models and options. There is a seemingly endless combination of service, pricing, and delivery options, providing a solution for most situations.

3) Facilities management – in the facilities management model, assets remain with the Institution, but are operated and managed by the outsourcer using its staff. The facility's service may be internally-focused (for example, a building) or externally-focused (operation of a distribution infrastructure). In this model, the Institution would typically retain significant risk for assets.

4) Multisourcing – this refers to large (predominantly IT) outsourcing agreements. Multisourcing is a framework to enable different parts of the client business to be sourced from different suppliers that interoperate to provide the desired outputs or services. This requires a

governance model that communicates strategy, clearly defines responsibility and has end-to-end integration.

5) Leases – A lease is an agreement whereby the lessor conveys to the lessee in return for a payment or a series of payments the right to use an asset for an agreed period of time. Leases can be classified as finance leases and operating leases.

A finance lease is a lease that transfers substantially all risks and rewards incident to ownership of an asset. The classification of leases between operating and finance leases are important as, in terms of regulation 13.2 of the PFMA, the Institution is not able to enter into finance leases in terms of the PFMA (regulation 13 and 32), except through a PPP, where Treasury Regulation 16 (PPP agreements) is applicable. Regulation 13 states that 'with the exception of agreements concluded in terms of Treasury Regulation 16, the accounting officer of an institution my not enter into finance lease transactions'.

The Office of the Accountant-General issued practice note 5 of 2006/2007, which deals in more detail with the entering into of finance leases in terms of the PFMA. The practice note states the following:

> Despite the provisions contained in Treasury Regulations 13 and 32, departments, constitutional institutions and public entities may in future enter into finance lease transactions without approval of the relevant treasury, provided that:
> a) the finance lease is found to be more economical than an operating lease; and
> b) the period of the finance lease does not exceed 36 months or 60 months in respect of motor vehicles; and
> c) the finance lease is for the acquisition of equipment, including equipment procured in terms of RT3 of 2006, that is required for the day-to-day operational requirements of the department, constitutional institution or public entity for which funds have been appropriated by the relevant legislature (in the case of departments and constitutional institutions) or for which a budget has been approved by the relevant executive authority (in the case of public entities). The aforementioned equipment refers to equipment such as photocopiers, PABX boards, computer hardware and motor vehicles; or
> d) the finance lease is entered into in terms of a transversal contract entered into by the National Treasury on behalf of institutions to which the contract applies.
> Agreements entered into under PPP arrangements fall outside the scope of this practice note.

An operating lease (also referred to as equipment rental or rental agreement) is a versatile option for financing high depreciation, short life span new technologies such as computers which generally have a short lifespan due to high obsolescence. The supplier purchases equipment and rents it to the Institution for an agreed payment schedule over a fixed term. Whilst similar to a finance lease, an operating lease has greater flexibility. It provides the ability to upgrade to new technology through a simple variation of the existing contract (certain criteria apply). This variation can be implemented during the initial term of the agreement. The Institution can add in pieces of equipment and, if required, replace or upgrade equipment. It can also choose to have maintenance software installation and other intangible items included in the agreement. It is worth noting that in respect of operating leases, regulation 13.2.4 is applicable, which provides that the accounting officer of an institution may, for purposes of conducting the Institution's business, enter into lease transactions without any limitations, provided that such transactions are limited to operating lease transactions.

A full maintenance lease is a lease in which the lessor is responsible for all maintenance and service charges.

6) Goods and/or Services Contracts (traditional procurement) – a Goods and Services Contract occurs where a supplier carries out a service or supply goods in return for payment. Goods provided should be: as described; of satisfactory quality and fit for their intended purposes. Services should be carried out: as agreed, with reasonable care and skill, within a reasonable time.

7) Service Level Agreements (SLA) – an SLA is a formally negotiated agreement between two parties. It is a contract that exists between customers and their service provider, or between service providers. It records the common understanding about services, priorities, responsibilities, guarantee, and such — collectively, the level of service. For example, it may specify the levels of availability, serviceability, performance, operation, or other attributes of the service like billing and even penalties in the case of violation of the SLA. This is less a different type of outsourcing than a more formalized approach, and would typically be seen within the arrangements described under all of the above options except finance leases and goods contracts.

Advantages of outsourcing

Organizations that outsource are seeking to realize benefits or address the following issues:[1]

1) Cost savings: lowering the overall cost of the service to the business. Companies usually outsource to a vendor that specializes in a given function and performs that function more efficiently than the company could, simply by virtue of transaction volume.
2) Cost restructuring: operating leverage is a measure that compares fixed costs to variable costs. Outsourcing changes the balance of this ratio by offering a move from fixed to variable cost and also by making variable costs more predictable.
3) Improve quality: achieving a step change in quality through contracting out the service to providers with specialized competencies and at pre-defined service levels.
4) Knowledge: access to intellectual property and wider experience and knowledge.
5) Contract: services will be provided against a legally binding contract with financial penalties and legal redress. This is not the case with internal services.
6) Operational expertise: access to operational best practice that would be too difficult or time consuming to develop in-house.
7) Staffing issues: access to a larger talent pool and a sustainable source of skills.
8) Capacity management: an improved method of capacity management of services and technology where the risk in providing the excess capacity is borne by the supplier.
9) Catalyst for change: an organization can use an outsourcing agreement as a catalyst for major step change that cannot be achieved alone. The outsourcer becomes a change agent in the process.
10) Reduced time to market: acceleration of the development or production of a product through the additional capability brought by the supplier.
11) Commodification: the trend of standardizing business processes, IT services, and application services enabling businesses to buy intelligently at the right price. This allows a wide range of businesses access to services previously only available to large corporations.
12) Risk management: an approach to risk management for some types of risks is to partner with an outsourcer who is better able to provide the mitigation.
13) Focus: some companies outsource in order to eliminate distractions and force themselves to concentrate on their core competencies.

[1] Source: http://en.wikipedia.org/wiki/Outsourcing#Deciding_to_outsource

Disadvantages of outsourcing
Some of the major potential disadvantages to outsourcing include poor quality control, a lengthy bid process, and a loss of strategic alignment. All of these concerns can be addressed and minimized.

Traditional procurement vs PPP[2]
It is important to understand the traditional procurement approach (option 6 in the above summary) in contrast to the PPP model. While there is no universal definition of traditional procurement, characteristics might include:
- The public sector procures assets, not services, from the private sector, or vice versa.
- Assets are input-specified
- The private sector is responsible for delivering assets, not for their long-term performance beyond standard warranty periods.
- The project management of procurement typically remain with the public sector, including the risk of successfully integrating multiple works contracts.

Service providers
Outsourcing can be undertaken by two groups of entities, being:
1) Other government entities; or
2) Private sector.

Outsourcing to another government entity may be applicable where such entity has the specialist knowledge to deliver a specific product or service, or where it may be required by law, for example SITA and the South African Council of Educators (SACE).

1.4.3.2 Public Entity

A public entity is a government business enterprise or a board, commission, company, corporation, fund, or other entity which is established in terms of national legislation, fully or substantially funded either from the National Revenue Fund or by way of tax, levy, or other money imposed in terms of national legislation and accountable to Parliament. Schedule 3A and 3D public entities can borrow money for bridging purposes with the approval of the Minister and schedule 2, 3A, and 3B entities can enter into finance leases through certain functionaries as defined in the PFMA.

Public entities are established in the public sector, but outside the public service, typically for reasons of strategic, social, or economic intervention by the State or to deal with strategic risks and dangers that the State or society face to their security, health, prosperity, or wellbeing; and/or adopting commercial and business principles in service delivery when required; and/or signalling that there is need for objectivity and more operational autonomy, yet retaining accountability in the delivery of services.

The process to establish a public entity is well legislated, and various guidelines have been published by the National Treasury. In terms of the guidelines, the following need to be addressed in establishing a public entity:
- The rationale for agencification;
- Mandates for the creation, listing and classification of a public entity;
- Elucidating the process to create a public entity; and
- Deploying (transferring) public servants to a public entity.

[2] Source: Delivering the PPP promise, A review of PPP issues and activity, published by PriceWaterhouseCoopers

However, given the nature and scope of this e-Education Initiative, it is highly unlikely that a new public entity would be established. As such, this option is not further described. It should, however, be noted that existing public entities, such as SITA, USAASA, and SACE, may be used for service delivery, but as such then fall under the outsourcing option.

1.4.3.3 Partnerships

Public-Private Partnerships (PPP)

In broad terms, a PPP is simply an agreement between the government and a private company, to share the risk and rewards of a project, in which the private party assumes substantial financial, technical, and operational risk in designing, financing, building, and operating a project. PPP is also a formal term, relating to a procurement model that is defined by policy guidance, rules, and regulations. In South Africa, such arrangements fall under Treasury Regulation 16 to the PFMA for the Institution.

It constitutes a viable solution to the scarcity of technical and financial resources within governments. Through PPPs, government contracts can, for example, simply state their requirements about IT products or services, and leave the technical specification to the vendor to fulfil. As a result, risks such as operational and technology/obsolescence risks are transferred to the vendor. PPPs generally entail that the asset and all related services are provided through one contract. They are generally long-term contracts involving substantial initial capital investment and are often limited or non-recourse financed. The PPP is regulated through an SLA with government operating as the purchaser of services and/or enabler of the project responsible for monitoring and regulating service delivery.

A typical PPP would have the following characteristics:

1) Substantial risk transfer;
2) Value for money, which is critically dependent on the way risks are allocated between the parties;
3) Affordability;
4) The private sector partner typically invests in a capital asset and is responsible for maintaining and operating it over the life of the contract;
5) The focus is on services provided and not on assets used;
6) Government assets are often transferred or made available to the private party; and
7) The contractual arrangement specifies that a private party takes responsibility for and assumes the risks for all or part of a public sector function.

PPPs provide access to private sector design and innovation skills, project management skills, and private sector finance. They are often used to access resources that may not be available in the public sector, thereby speeding up development. They are also a mechanism for transfer of substantial risk from the public to private sector. Other advantages are the ability to spread cost over the lifetime of the project, providing greater predictability of cost over time and focusing on value for money over the lifetime of the asset. This option also reduces the impact of public borrowing.

However, PPPs also pose some challenges, including the need to comply with specific PPP regulations, higher cost due to the increased cost of procurement, risk transferred, and higher cost of private funding, length of procurement process, and inflexibility.

The key contrast between PPPs and traditional procurement is that, with PPPs, the private sector returns are linked to service outcomes and performance of the asset over the contract life. The

private sector provider is responsible not just for asset delivery, but for overall project management and implementation, and successful operation for several years thereafter. However, many of these benefits can also be obtained through 'smart' outsourcing contracts.

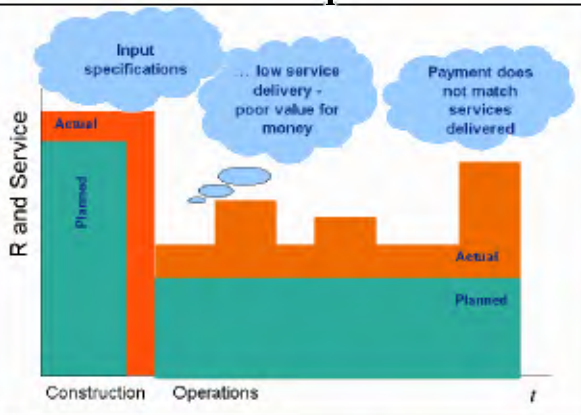
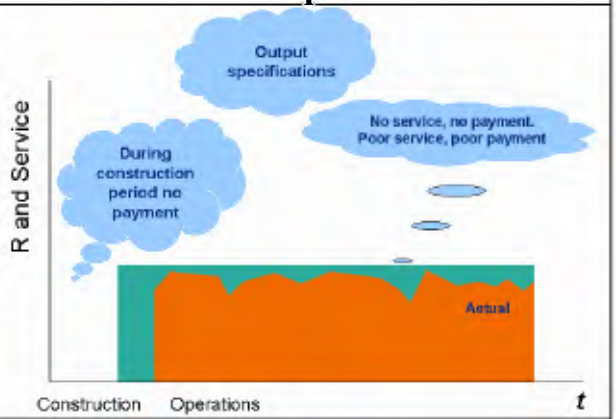
PPPs are increasingly being used in various parts of the world to finance ICT and e-government projects, especially in the United Kingdom education industry. They offer a powerful model for government and industry to work together rapidly, creatively, and collaboratively to achieve common goals

Evidence to date suggests that a PPP can be appropriate where there are major and complex capital projects with significant ongoing maintenance requirements. Here, the private sector can offer project management skills, more innovative design, and risk management expertise that can bring substantial benefits. Where they are effective, PPPs help to ensure that desired service standards are maintained, new services start on time and projects are completed on budget, and the assets are of sufficient quality to remain of high standard throughout their life.[3]

However, PPPs are unlikely to deliver value for money in other areas, for example where the transaction costs of pursuing a PPP are disproportionate to the value of the project or where fast-paced technological change makes it difficult to establish requirements in the long term.[4]

The two diagrams below depict the payment structures for an outsourcing or in-house service delivery option and a PPP. They demonstrate many of the specific characteristics of a PPP.

Table 1 In-house vs PPP option

In-house option	PPP option
	
• Service specifications are input based.	• Service specifications are output based.
• Payment is made periodically, both in the 'construction phase' and the 'operational phase' based on time and material or milestones. Payment is not generally linked to quality of services delivered.	• No payment is made for period that assets are acquired or developed (referred to as 'construction phase'). Payment is only made once services are delivered and in accordance with availability and performance specifications. Thus principle of 'no service, no payment' is applied.
• Payments are not fixed over the long term.	• Payments are fixed over the long term.
• Different suppliers contracted to service whole-life cycle of an asset.	• Single entity responsible for all phases of a project with expertise subcontracted by entity

[3] Source: Meeting the investment Challenge, July 2003, obtained from www.hm-treasury.gov.uk
[4] Source: Meeting the investment Challenge, July 2003, obtained from www.hm-treasury.gov.uk

In-house option	PPP option
	and not department. Thus same entity responsible for whole-life cycle of an asset.
• Assets are often purchased at lowest cost without taking into account whole-life cycle costing of initial investment decision.	• Whole-life cycle costing are taken into account when purchasing assets, such as electricity consumption of various ICT infrastructure in order to provide best value for money over the long term.
• Risk of cost overruns is mostly borne by the government.	• Risk of cost overruns is borne by the private party.
• Funding is provided by government.	• Funding is mostly provided by the private sector.

The PPP model is only likely to be applicable where:
- The private sector has the expertise to deliver and there is good reason to think it will offer value for money;
- The structure of the service is appropriate, allowing the public sector to define its needs as service outputs that can be adequately contracted for in a way that ensures effective, equitable, and accountable delivery of public services into the long term;
- It can be demonstrated that a PPP offers greater value for money for the public sector compared with other forms of procurement; and
- The nature of the assets and services identified as part of the PPP scheme are capable of being costed on a whole-of-life, long-term basis. Investment with a time horizon of five to ten years is unlikely to benefit from the PPP approach.

The use of a PPP would be inappropriate where:
- The pre-conditions of equity and accountability in public service delivery cannot be met, as in most forms of frontline service delivery;
- The transaction costs of pursuing PPPs are disproportionate compared to the value of the investment a project is delivering, impairing its value for money; or
- The fast pace of technological change in a particular sector makes it too difficult to establish requirements in the long term, or high levels of integration make enforcing systems' risk allocation difficult.

IT PPPs[56]

Practices in government procurement of IT vary from country to country. They range from being completely transparent to systems that give preferential treatment to a particular seller. Traditionally, decentralized IT procurement within a government was a common practice, which often led to a number of inefficiencies in the procurement system. For example, many country governments executed procurement of IT on the lowest bid basis, completely ignoring the experience of leading systems providers. This practice limited competition and favoured incumbent suppliers.

Procurement of IT by governments has undergone a significant change in recent years. In the United States of America (USA), individual states have their own sets of guidelines for procurement of IT. In the United Kingdom, the government established the Office of Government Commerce (OGC) under Her Majesty's Treasury,[7] which oversees the procurement process across

5 Source: Meeting the investment Challenge, July 2003, obtained from www.hm-treasury.gov.uk
6 Source: KPMG Global Markets – Quarterly insights briefing – government, 2008
7 www.ogc.gov.uk

the public sector. Since its introduction, the OGC has brought about many innovative ideas for enhancing the procurement process and optimizing negotiations for getting best value for public's money.

Governments are large buyers of IT. However, their orders get divided into many small orders at departmental and regional levels. To take advantage of economies-of-scale, governments are creating central agencies for procurement of IT to consolidate orders at departmental and regional level, which give them the best price and best services from vendors.

The government of Australia has centralized procurement of computer systems and notebooks, through an initiative entitled ITS 2007. Under this programme, all requests from different departments are consolidated to make one large bulk order. This enables the government to get the best deals and one standardized hardware standard across all departments. The process is expected to result in savings of AUD 567 million over four years.[8]

The United Kingdom's government's OGC is acting as a one-stop shop for the procurement needs of all government agencies. In addition, the government manages its IT projects and procurements using the Prince2 method, which identifies processes to track the activities of the project from start to finish. It does so by identifying roles and responsibilities of each member, and setting up details about inputs and requisite outputs for each process. The government plans to continue using this system and expand its usage across more departments.[9]

In the USA, the state government of Colorado has decided to consolidate its IT functions, including its state wide IT procurement, to manage its IT spending efficiently.[10] The US Office of Management and Budgets has clearly laid down the acquisition procedure for IT systems and e-governance.[11] Also, the savings and implementation of such procurements are regularly updated on the US government's Results.gov web site.[12]

Governments in different countries have also realized that they need to set clear guidelines and have well-defined processes to purchase major IT effectively. Procurement of IT is a capital-intensive exercise, and there is often a scarcity of financial resources within government budgets to finance such initiatives on their own. As a result, governments are increasingly favouring the model of transferring or sharing risks and rewards of IT projects with the private sector.

The concept of PPP in IT procurement was started in the United Kingdom, and formally introduced in 1992. However, PPP models are not always successful, and failures attract a lot of media attention. One model which has proven to be particularly unsuccessful in the United Kingdom has been the private finance initiative (PFI). Following a number of failures, the Treasury announced in July 2003 that PFI was inappropriate for procurement of IT products or services because of the inability of vendors to recover the full cost until the project is fully completed, which can take years.[13]

However, this has not been observed in other countries, where governments are successfully using PPPs to implement large-scale IT projects. IT projects have been successfully implemented in

8 ITS 2007 PC and Notebook computer contracts, Government Chief Information Office of Australia, October 10, 2007
9 Transforming Government Procurement: HM Treasury: January 2007
10 Colorado Governor Announces State wide IT Consolidation Plan, Gov Tech, September 2007
11 Section -53, Information technology and E-Government, Office of Management and Budget Circular 2007
12 http://www.whitehouse.gov/results/
13 Government IT projects: Life after PFI, Practical Law Company, November 2004

countries such as the USA, Australia, India, Mexico, and Brazil. As a part of its e-government initiatives, the Arizona State Government engineered a PPP contract with IBM in 1998, and the project ran until 2006.[14]

MCA21 by the Government of India is a benchmark PPP project implemented by the Ministry of Company Affairs to automate the company registration system in India.[15] In 2006, the MCA started an ambitious project of digitization of all of its physical records and automation of all processes related to enforcement of and compliance with legal requirements for companies registered in India.

GeBIZ[16] is the e-procurement portal of the government of Singapore. The government wanted to digitize its entire procurement process by implementing an efficient IT system. Development of the technical platform and maintenance support services were outsourced to NIIT, an Indian software and services company. NIIT designed the entire technical platform, and received a licensing fee for the sale of its intellectual property. The other component of returns to NIIT is based on customization of the software and the number of users using the platform. This attractive revenue-sharing model not only benefited NIIT but also yielded significant gains for the Singapore government in the form of a foolproof e-procurement system.

Various factors need consideration in an IT PPP when deciding on the PPP procurement route:

- The fast pace of change in the sector, which may make it difficult for the public sector to define the outputs it requires in a long-term contract effectively;
- The high level of integration of IT infrastructure into the other business systems of the procurer, which makes it more difficult to delineate clearly areas of responsibility to the client and the contractor, and so may make an appropriate sharing of risk more difficult to both discern and enforce;
- The market for third-party finance in IT PPPs;
- The nature of the capital investment, with costs in IT dominated not by large up-front investment but by running costs; and
- The duration and phasing of investment, where IT projects have a short life and include significant asset refreshes.

Successful implementation of IT procurement has always been difficult, for both the public and private sector, no matter what method is used. The Standish Group's report[17] on IT projects from the United States suggested that only 16 per cent of software projects are completed on time and on budget throughout IT procurement (based on the conventional procurement route). The report went further, stating that 'even when these projects are completed, many are no more than a mere shadow of their original specification requirements.

However, PPPs offers the chance of a more strategic approach and better requirement development, procurement process, governance and realization than many other approaches, as long as the contracts allow for greater ongoing flexibility and looser output specifications. Many PPP attributes can be applied to the other procurement options as well.

In the area of government procurement of IT, governments have started consolidating their demands and centralizing the entire procurement procedure. Governments are also trying to ensure

14 Virginia Department of Taxation, December 2006
15 Ministry of Company Affairs, Government of India, February 2008 and TCS Media release, February 2006
16 NITT partners Singapore co. bags Govt deal, October 2006
17 Source: The Chaos Report, The Standish Group, 1995.

transparency in the bidding process so that they are able to attract best bidders with innovative ideas. Also, PPP has emerged as a powerful paradigm to help ensure the competitiveness, sustainability, and effective management of various IT projects. The model of transferring risks and rewards of an IT establishment is highly attractive for the private sector to invest in government IT establishments. When the sharing of risks and rewards of the venture benefits both the public and private parties involved in the contract, the PPP model of establishing IT projects is observed to be very successful.

Public-Public Partnerships

The basic difference between a PPP and a Public-Public Partnership is that, with a PPP, the service provider is from the private sector, whereas, with a Public-Public Partnership, the service provider is from the public sector. Another significant difference is that, with a Public-Public Partnership, the risk remains with Government. It should further be noted that, apart from the service provider coming from either the public or private sector, the PPP and Public-Public Partnership otherwise share the same legal principles, but partnering with a public sector service provider would not imply the same procurement principles.

The definition of the word 'private party' in Treasury Regulation 16 implies that Public-Public Partnerships do not fall within its regulatory framework. According to the definition Public Entities like SITA cannot participate in a PPP transaction as a private party because of the listing in Schedule 3A, 3B, 3C and 3D of the PFMA. Treasury Regulation 16 further defines the word 'institution' by referring, among other things, to public entities listed in schedule 3A, 3B, 3C and 3D of the PFMA. It is on this basis that Public–Public Partnerships are excluded in terms of the Treasury Regulation 16.

1.4.3.4 Privatization

Privatization is the incidence or process of transferring ownership of business from the public sector (government) to the private sector (business). In a broader sense, privatization refers to transfer of any government function to the private sector.[18] Given the nature and scope of the e-Education Initiative, privatization is not a valid procurement option, and is therefore not discussed any further.

1.4.4 Deciding On a Procurement Option

Given the nature, size, and scope of the e-Education Initiative, different procurement options or combinations thereof may be applicable to the different Pillars. As such, recommendations regarding procurement options are discussed further under each applicable section of this document.

[18] Source: http://en.wikipedia.org/wiki/Privatisation

2 ICT Infrastructure

2.1 Introduction

The sections below provides more detail regarding: 1) the principal ICT infrastructure capabilities that the Institution must procure in order to support the e-Education Initiative options; 2) the entities that can contribute to achievement of the required capabilities, some of which are within the Institution and others outside; 3) third party procurement approaches; 4) different approaches to procurement; 5) suggested applicability of the procurement approaches to the elements of the ICT Infrastructure; and 6) assessment of each material ICT infrastructure 'build' requirement to determine if there are exceptions to the directions suggested in this section.

2.2 Probability of a Public Private Partnership

Several items have been considered to assess the probability of the PPP procurement route. These included the following:

Table 2 Items to consider in respect of PPP procurement route

Matter	Commentary
Scale, complexity, and political sensitivity of the Initiative	The Initiative is complex and has a particularly large scale and will require comprehensive risk management to assure success. The ongoing project management should include competent risk management. Illustrative matters to be considered are: • Budget and expenditure risk: unless the budget and expenditure processes are ring-fenced, there is a risk that budgeted funds may not be expended as planned or that sufficient budget may not be allocated. Cost and budget risks will be exacerbated if the project does not control all material cost elements required to support a successful outcome. For example, project risks will rise if infrastructure costs and ICT costs are separately managed. • Schedule risk: schedule development and compliance will not be determined and managed by a single body. Provincial requirements and priorities can influence timings. This factor, amongst others, increases schedule risk. • Scope risk: the scope is fairly simple in the management and administration spheres and can be well-defined. Development of short-, medium-, and long-term systems architecture will reduce scope risks. The requirements and influences of the individual provinces increases scope risk. • Resource risk: a range of resources will be required to achieve successful outcomes. These include ICT architecture, ICT operations management, project management, school deployment support, operational support, application support, school system operation, maintenance, and so on. These resources will be needed for both urban and rural environments, and will comprise departmental staff, provincial staff, and third parties. Effective policy, planning, coordination, and control will be necessary to ensure the availability of suitably capable skills. Resource risks will need close management. • Procurement risk. Procurement options are not yet considered. However,

Matter	Commentary
	it is likely that procurement will be complex and will demand carefully-devised strategies to facilitate cost-effective delivery. • Stakeholder and change management risk: this project affects a very large number of direct stakeholders and significant number of indirect stakeholders (provincial management, supplier and lobby groups, politicians, and so on). The project is of a scale that makes it impossible to communicate intentions and project details directly from the project's management to stakeholders on a regular and consistent basis. This creates a risk of misinforming and misunderstanding. The nature of the project will also influence the manner in which work is done, which demands careful attention to change management issues. • 'Business' deployment risk: this refers to the extent of change in the way the 'business of schools' is performed and the risks associated with such change. Whilst there may be some endemic risks, the project must recognize that there may be specific risks that apply only, or especially, to some provinces, types of schools or other defining characteristics. • Technology deployment risks probably represent the smallest risk, providing all other risks have been suitably managed. The proposed technologies are not complex, and the timeframes suggested for selective deployment of open standards-based solutions, including FOSS, are sufficiently long to enable concomitant risks to be identified and mitigated. The major risk to technology relates to its protection and sustaining, but this risk is managed through other areas. The principal technology risk relates to the effectiveness of forecasting demand for network and computer capacity. Under-planning will result in dissatisfaction and sub-optimal results, whilst over-planning will lead to cost wastage. • Political risk: the structure of South African education does not generally provide for a single locus for policy and financial control. There is a large provincial aspect to policy development and funding. Not only will harnessing all provinces into a single direction require material coordination effort, sustaining this direction over an extended period will be challenging and present real risk. Provincial priorities may not remain synchronized with the aims of the project.
Achievement of necessary prerequisites	The e-Education Initiative depends on satisfactory meeting of the pre-requisites. The prerequisites are not technically challenging or complex, but may nevertheless be difficult to achieve. Focused management attention will be required to overcome a number of obstacles. For example: • If budget and/or management of the achievement of pre-requisites is managed outside the e-Education Initiative (for example, as a separate project or within a provincial mandate), the risk of sub-optimal delivery from the e-Education Initiative will rise. However well-intentioned the responsible parties are, experience shows that projects whose outcome are significantly dependent on other 'external' activities have a high risk of not meeting budget, schedule, or desired outcomes. • Coordination: completion of prerequisites needs to be closely coordinated with delivery of ICT services and infrastructure. The consequences of late delivery are obvious, but equally early delivery is undesirable. • Single point of accountability: good practice suggests that delivery of ICT services to a school has a single point of accountability. A fragmented approach may facilitate vague responsibilities which, in turn, may result in poor delivery. • A significant element in the prerequisites is provision of power supply

Matter	Commentary
	and other external infrastructure. The Institution may be in a position to influence progress on such matters but it cannot control them. These external services are not typically planned on a 'few-months' time horizon, but are more commonly planned over more extended timeframes. The Institution will need to liaise with such suppliers and also reflect their long-term planning needs in its own plans.
Risk relating to the quality of existing ICT infrastructure;	Significant ICT deployment has occurred only in two provinces, being the Western Cape and Gauteng. Both provinces' deployments have made use of standard technology (personal computers, servers, printers, and so on). This technology has a useful life span in the order of four years, while existing installations are between nil and over four years old. It is likely that existing equipment would be at, or close, to the end of its useful life when the requirement to incorporate it into a new paradigm occurs. Gauteng is presently starting to deploy computer laboratories that are, at least in part, based on FOSS. The Institution should consider issuing an early guideline that sets out its technology roadmap, and proposes that provinces ensure that equipment acquisitions are compatible with a selective migration towards FOSS. Because of two factors it is expected that the risks of equipment redundancy and equipment non-compatibility are low: (i) most current equipment is capable of being used to some extent in 'managed client' environments; and (ii) current installations can be planned to be migrated at or close to the end of their useful life (typically four to six years after installation).
Risk allocation, specifically how to deal with particular IT risks such as scalability in terms of volume and usage, foreign exchange, technological advancements; and	Future risk allocation: possible future risk allocation options will depend on the preferred procurement option: for example, if the Institution chose to perform the task of specifying technology to suppliers, it would automatically assume the risk that are the concomitant of poor specifications. Accordingly, this section only indicates at a high level some of generic risk allocations that are possible where third parties assume a risk-based role: • Scalability: scalability risks apply most significantly to wide area network bandwidth use. Two extremes of approach are possible: – The Institution seeks 'adequate connectivity' and places risk on the supplier to anticipate and price demand (including the risk of under-estimating). Network demand is extremely volatile (SITA notes that capacity increases per annum by almost 100%). Finally, the project envisages a significant engagement period: forecasting the demand curve for such periods is highly risky. For these reasons, it is unlikely that there will be strong market appetite for this model. – The Institution estimates its annual bandwidth requirements and procures the defined bandwidth from suppliers. The Institution also identifies increments in usage and seeks supplier pricing for such increments. This option would be more attractive to suppliers, as it provides a specific base requirement that can be properly costed and delivered, and proved costed increment. Clearly, in the first option, the supplier takes significant risk, whilst, in the second, much risk is retained by the Institution. Variants that share risks differently can be considered. However, it is likely that market-compatible options will lean more towards the second option in view of the extreme unpredictability of demand. • Foreign exchange (forex): whilst the Institution is likely, but not certain, to procure network capacity, equipment, and software from South African suppliers, computer equipment and software will contain foreign cost

Matter	Commentary
	components. It will be important, especially where local purchases occur, to ensure double-dipping does not arise from overlap of forex risk and local CPIX risk. If required to do so, third party suppliers will manage forex risk via hedging instruments and are usually comfortable to do so for the term that such arrangements are available from financial institutions. A challenge of this project is its lengthy term. Suppliers are unlikely to be able to obtain, for example, 20-year hedges. It is likely that market-acceptable mechanisms could include fixed rand-based pricing with review points to take account of the lengthy term. The rules associated with these review points can be pre-agreed to ensure the balance of risk ownership remains. In summary, these mechanisms mean that both the Institution and the supplier outsource a large part of their forex risks to financial institutions at a cost that is built into the contract pricing. • Technology obsolescence: the rapid rate of product evolution is a significant challenge with ICT equipment, software, and networks. This is especially true with longer-term arrangements. An example is the likely progressive migration from laboratory-based desktop PCs to classroom-based securely-designed laptops. If laptops have evolved in cost and 'securability' to the extent they may effectively replace the need for a dedicated laboratory, then it can be argued that investment in labs and the PCs therein will become redundant. Equally, if technology emerges that is better for the job than that presently used, present technology may become sub-optimal. In the education milieu, this should not be seen as an issue on a large scale: Schools do not require the 'latest' technology in order to perform effectively. Additionally, technology-refresh cycles of four to seven years would mean that no school would be too far behind the latest developments. The technology obsolescence question for this project is more associated with how risk is shared between a third party and the Institution when one type or model of equipment (for example, a PC with the initial configuration) becomes inadequate to meet emerging user demands or, alternatively, is phased out in order to be replaced by a more effective solution (for example laptops) that has become pervasive and equally cost-effective. Here, two extreme options are available: - The Institution defines the technology outputs (a simplistic example: each learner shall have access to a computing device and printing services for four hours per week in laboratories or classrooms as determined by the Institution). In this case responsibility for, and risk associated with technology choice is borne and priced by the supplier. - The Institution defines an initial configuration for a PC, and sets out a mechanism for calculating the financial effect of configuration updates that it determines are required from time to time. Clearly, there variants between these extremes. Typically, the most appropriate variant will be one that allows the obsolescence risk to be most cost-effectively managed. This, in turn, will be affected by the extent of relevant technology risk management skills and capacity the Institution retains. Most commonly, in a PPP procurement, the preferred paradigm will be closer to that described under (i) above than that described under (ii).
The unique requirements of the educational environment, in that no one-size-fits-all model can	The Feasibility Study has demonstrated that there is not a single standard approach to the provision and use of ICT equipment and software or connectivity that will meet the needs of every school. The school's location, size, access to technologies, and the like all suggest that each school's

Matter	Commentary
be proposed for several aspects of the e-Education Initiative (as the analyses to follow will demonstrate), thus retaining the need for diversity of options to meet different educational needs.	requirements will differ. However, further consideration shows that the 'uniqueness' of a schools requirements are variations on themes rather that fundamental differences: The schools, will use broadly similar technologies for broadly similar functional requirements. The implications are: • Generic models for school requirements can be developed. The Feasibility Study has developed a range of characteristics (for example, size or location of school) on which generic models can be based. These generic models may need to be updated from time to time as technologies and/educational requirements emerge. Third party contractual mechanisms would be required to manage the implications of such changes. • Each school's situation would need to be assessed against the most closely applicable generic model. The assessment would review the school's current investment in ICT, its ICT maturity level and other factors such as the local availability of network technologies and support service. Variants on the generic model would be determined on a case by case basis in order to develop the most relevant requirements. • The mechanisms described in the above bullet points could be effectively accommodated in a number of procurements approaches and this should not present any material obstacles

Various views have been articulated on the effectiveness of ICT PPPs. These range from the view that they can be an effective vehicle for acquisition of ICT products and services through to dismissing them as a viable procurement mechanism owing to the rapidly changing nature of both the technology itself and the institution's requirements. Probably a balanced view for the education environment is presented by:

> While PPPs may prove to be useful for education departments facing shortages of infrastructure, they will not be unproblematic and certain aspects need to be examined very carefully.[19]

We believe that PPPs as conceived of and described in Treasury Regulation 16 are not likely to be a preferred option owing to the significant challenges arising in transfer and management of the risks associated with long-term technology procurement. Nevertheless, many principles of contracting and contract management associated with PPPs will be germane. We suggest that contracting approaches incorporate the beneficial principles of PPPs but address their shortcomings by using alternative, and more flexible, mechanisms.

2.3 ICT Capabilities

The e-Education Initiative calls for procurement of a wide range of capabilities, the most important of which are summarized in the table below.

Table 3 ICT infrastructure capabilities to be procured

Capability	Description
Architectures	Refers to the enterprise-wide view of all business ICT requirements and how they integrate, as well as the policies and standards that will guide construction of the architecture. They provide a medium- to long-term roadmap for ICT activities as

[19] John Pampallis (Director – Centre for Education and Policy Development.

Capability	Description
	well as the services to ensure that delivery leads to the desired and integrated result. Architecture elements include applications architecture, data architecture, and security architectures. Note that the same architecture portfolio will cover both ICT infrastructure and connectivity.
Design	Refers to design of ICT infrastructure solutions. It covers the range from architectures to standardized configurations. It covers hardware, software, and LAN design and produces specifications to the extent that the 'Build' activity can commence.
Build	Refers to acquisition of the specified requirements. This can occur through i. Development: for example, building a product (for example, a custom-made PC or a programme) to specification with own resources or third-party resources. ii. Procuring a ready-made product from third parties (for example, off-the-shelf software or a standard PC). iii. Customization, being procurement of a base product per (ii), followed by customization and enhancements to meet specified needs.
Deploy	Refers to installation and implementation of the specified requirements in the target environments. It includes, for example, product and other customizations to meet site-specific needs, technical and user training, facilitating user-adoption, change management, project management, and post-deployment reviews.
Operate	Refers to ensuring daily availability of ICT infrastructure by ensuring that routine ICT infrastructure management tasks are performed. Examples include routine checks, database management, first line troubleshooting, security and user registration, and data backup.
Technology Support	Refers to services that provide technology support to operators of the ICT infrastructure.
User Support	Refers to services that provide advice and guidance and other relevant services to users of the ICT infrastructure.
Maintain	Refers to services required to keep the deployed ICT infrastructure operating in accordance with its specifications. This may include both reactive and proactive maintenance.
Enhance	Refers to addressing emerging requirements that result in amendment of then-current specifications. Requirement may by driven by technology (a new version of an operating system is required by a new application system, a new operating system version requires a hardware upgrade) or by the Institution's needs (for example, the Institution determines the need to improve its ability to track learners from pre-primary to early work history, leading to changes in systems).
Refresh	Refers to replacement of existing ICT infrastructure when it reaches the end of its economic life.
Quality management	Refers to activities that aim to maintain and improve quality. Quality covers quality of delivery (for example, performance/capacity management and service management), suitability, and improvement of services for users.
Transfer	Refers to transfer of ownership of ICT infrastructure to the Institution. This may happen on deployment or may occur only at the end of a defined contract term.

2.4 ICT Capability Sources

The main players who could potentially play a role in the delivery of these capabilities are:

- The national Department of Education;
- Provincial Departments of Education;
- Provincial administrations;

- District offices;
- Schools;
- SITA; and
- The private sector.

Clearly, there are several permutations in the manner in which the players can address the capabilities. For example, an arbitrary example of such allocation could be:

Table 4 ICT capability sources

Objective	National Dept	Provincial Depts	Provincial Admin	District Offices	Schools	SITA	Private Sector
Architectures	Yes					Yes	
Design	Yes					Yes	
Build							Yes
Deploy		Yes					Yes
Operate					Yes		
Technology Support		Yes	Yes	Yes		Yes	Yes
User Support	Yes	Yes	Yes	Yes		Yes	
Maintain							Yes
Enhance							Yes
Refresh							Yes
Quality management	Yes	Yes		Yes		Yes	
Transfer							Yes

The above arbitrary example provides a simplified view. For instance, in the example, only the provincial Departments of Education are shown to play a role in deployment. In reality, this could involve the provincial and national Departments of Education, as well as district offices and schools.

2.5 Procurement Options Outside the Institution

Procurement options outside the Institution fall into three groups. They are:
- State agencies;
- Provincial ICT competencies; and
- Private sector organizations.

Each of these groups is discussed further below.

2.5.1 State Agencies

In this context, the only State agency that can offer relevant services is SITA. SITA's legislative framework (the SITA Act as amended and regulation thereto) does not state a specified role in regard to schools (for further information, see legal due diligence sections). However, its general mandate suggests that the organization can be approached for provision of services relating to schools. Indeed, SITA is already providing certain similar services to FET Colleges.

Where ICT services and products are procured directly by the Institution, it must procure through SITA except where ministerial exemption has been given or procurement is done through a PPP. SITA's supply of capabilities may be only through each provincial Department of Education, through the national Department of Education conduit, or (and more likely) a combination of both.

In principle, SITA has the types of technical competency that are needed to deploy certain of the services demanded by the e-Education Initiative. However, SITA's capacity is matched to its current services and is unlikely to include the ability to absorb the demands of the e-Education Initiative. To meet these demands, substantial capacity-building will be required, which would include capabilities focused solely on the Initiative's requirements.

Another relevant State agency is USAASA. One of USAASA's strategic objectives is 'To be a centre of excellence in provision of universal service and access'. USAASA's involvement in several projects provides it experience and exposure that are potentially useful to the Department of Education. Examples are include Community Telecentres, the Thusong Service Centres, School Cyberlabs, and Community Digital Hubs. USAASA does not have the capacity to be a major service supplier to the Department, but there may be useful roles it may play in supporting the e-Education Initiative. For example, it may be able to play a role in the governance structure for the e-Education Initiative.

The Department of Communications states as its role[20] 'To create a favourable ICT environment that ensures South Africa has capacity to advance its socio-economic development goals, support the renewal of Africa and build a better world'. Its core functions include developing ICT policies and legislation that stimulate and enhance the sustainable economic development of the South African first and second economy and positively impact on the social well being of all of South Africa's people. The Department of Communications manifestly has a role to play in deployment of technology on the scale of, and with the strategic impact envisaged by, the e-Education Initiative. This role can be expected to be principally facilitative, as the Department of Communications does not have the role of being a direct supplier of services.

2.5.2 Provincial ICT Competencies

Whilst provinces make use of SITA to provide aspects of their ICT services, they retain ICT competencies. These competencies can be expected to vary in scope and capability from province to province. Because schools operate within a provincial framework, the potential of procuring certain capabilities by or through provincial competencies should be considered. A benefit of using, and perhaps building, provincial capacity to provide ICT capabilities for the e-Education Initiative is their already-close understanding of provincial standards and approaches and familiarity with the province. As with SITA, existing provincial competencies are, in most cases, unlikely to match the demands presented by the scale of the e-Education Initiative, which will generate a requirement to build capacity.

2.5.3 Private Sector

Many organizations either are or would be keen to be active in the South African education and ICT sectors. Every one is a potential supplier to the Institution in terms of the e-Education Initiative. In addition, there are foreign State and private sector organizations that may be able to

[20] www.doc.gov.za/

provide capabilities to the Initiative through aid packages or other commercial approaches. The following table summarizes the types of organization from which the Institution may procure ICT infrastructure requirements.

Table 5 Private sector organizations from which ICT infrastructure can be procured

Organization	Description
Countrywide SA/ international corporate sector	These are entities in the ICT or educational sectors that have sufficient size to be able to provide substantial services directly (or indirectly, by sub-contracting other entities) to the Institution across the whole country. Benefits include the potential of 'ready-to-roll' capability, but such organizations can be 'non-inclusive', resulting in low involvement of and benefit to, for example, local communities.
Provincial SA corporate sector	These are entities in the ICT or educational sectors that have sufficient size to be able to provide substantial services directly (or indirectly, by sub-contracting other entities) to a region or province of South Africa. As with the countrywide equivalent, benefits include the potential of 'ready-to-roll' capability.
Niche SA/ international commercial organizations	These are organizations that provide only a narrow range of services or products. They may also be geographically limited, for example only offering services in Gauteng or Cape Town, but not both. Advantages are that the focus and lower overheads of these organizations can allow them to be relatively cost-efficient. A drawback is their limited capacity and the need for the Institution to manage relationships with many entities.
Niche SA/ international NGOs	As with the commercial equivalent, these organizations provide a narrow range of services, but operate on a non-profit model.
Local entities	These are entities that operate only in a limited geographical area, for example, a suburb or a township. Such organizations tend to have a narrow range of skills, are attractively priced, but may not have capacity to deal with peak demands or provide consistently reliable services.
Consortia	Consortia bring together a diversity of skills from multiple organizations (either small or large) and focus them through a special purpose entity. Frequently, but not always, they are able to create good coverage and efficiencies. Consortia can create an extra profit layer. If not properly constituted, there is a risk that the consortia can be insubstantial and unable to cope with adversities.

As with other options, the scale of the e-Education Initiative is such that no entity will have the capacity to absorb all of the e-Education Initiative's demands.

For certain elements and options, the private sector will have a greater capacity to meet that Department's demands. For example, deployment of unmanaged clients in many areas (for example urban situations), could 'piggy-back' on pre-existing supply chains, and the additional capacity requirement would not distort the market materially. However, as with SITA, no private sector entity is likely to have spare capacity to provide for the Department's wide area networking requirement. Thus, it will be necessary to build capacity and competence.

2.6 Procurement Approaches

This section sets out procurement approaches that may be viable for all or some of the ICT infrastructure capability requirement. These approaches are not mutually exclusive: combinations and variants are possible.

Table 6 ICT infrastructure procurement approaches

Procurement Approach	Description
Public-Private Partnership	A Public-Private Partnership typically brings together resources that can deliver outputs specified by the public entity. PPPs can be designed to address some or all of the ICT infrastructure capabilities. Common PPP models provide for 'design-build-maintain-transfer', 'design-build-operate', and other variants. A PPP can be designed to meet specific government and department objectives, including BBBEE and community involvement. Typically, a PPP will provide a defined range of output capabilities in return for a unitary fee, although other pricing mechanisms can be applied where the situation demands it. Similarly, whilst the assets used in provision of PPP services tend to remain a supplier asset until transferred to the institution at the end of the term, this is not exclusively so. Usually, only one private partner consortium is involved in a PPP. PPPs are generally extended arrangements, commonly exceeding ten years.
Public Private Partnership	A Public-Public Partnership largely mirrors the concepts of the Public Private Partnership, except that the Private Party is replaced by a Public Entity. A Public-Public Partnership will differ from the Public-Private Partnership option in the financing methods.
National	Service or goods are procured through a single national agency, for example, the Institution and SITA.
Provincial	This option allows each province to undertake its own procurement, within national policy and standards. Provincial procurement may be better able to support provincial objectives than national procurement.
Supplier catalogue	In this option, the Institution develops a catalogue of the service and product requirements and puts the catalogue out to tender. Limited or no commitment with regard to consumption is provided. Based on adjudication, the Institution commits to one or more suppliers to procure, on conditions that have been agreed with the relevant supplier as and when the Institution needs products and services. These arrangements are advantageous when the institution cannot be certain about the actual rate of procurement.
Lease	This option provides the Institution with only the beneficial use of the ICT infrastructure assets. Commonly, assets are transferred to the Institution at the end of the term of the agreement.
Best-of-breed	'Best-of-breed' requires the Institution to identify the best supplier for each product or service. For example, the best suppliers of PCs may not be the best providers of maintenance services. Balancing obvious quality advantages is the requirement that the Institution manage multiple suppliers and the interfaces between their services.
One-stop shop	A one-stop shop is the opposite of best-of-breed. In this instance, suppliers are selected based on their ability to manage and integrate supply of products and services. Whilst they may manufacture and supply products and services, they may not be the best or most cost-effective for any individual requirement.

2.7 Applicability of non-Institution Procurement Options for Institutional Capabilities

The following table suggests entities that can be a practical source from which the Institution can procure ICT infrastructure capabilities. In this table 'Y' notes an option from which the Institution could potentially procure its entire requirement, whilst 'P' suggests a part-capability.

Table 7 Applicable procurement options for ICT infrastructure

Requirement	SITA	Provinces	Corporate sector		Niche SA / international		Local entities	Consortia
			Countrywide SA & Int.	Provincial	Commercial organizations	NGOs		
Architectures	Y	P	Y	P	–	–	–	Y
Design	P	P	Y	P	P (niche aspects)	P (niche aspects)	–	Y
Build	P	P	Y (with sub contractors)	P	P	P	–	Y (with sub contractors)
Deploy	P	P	Y (with sub contractors)	P	P	P	P	Y (with sub contractors)
Operate (schools competency)	–	–	–	–	–	–	–	–
Technology Support	Y	P	Y (with sub contractors)	P	P	P	P	Y (with sub contractors)
User Support	Y	P	Y (with sub contractors)	P	P	P	P	Y (with sub contractors)
Maintain	P	P	Y (with sub contractors)	P	P	P	P	Y (with sub contractors)
Enhance	P	P	Y (with sub contractors	P	P	P	P	Y (with sub contractors
Refresh	–	–	Y (with sub contractors	P	P	P	P	Y (with sub contractors
Quality management	Y	–	Y (with sub contractors	P	P	P	P	Y (with sub contractors
Transfer	–	–	Y (with sub contractors	P	P	P	P	Y (with sub contractors

The following table suggests potential types of procurement that could be applied to each capability requirement. Again, 'Y' notes an approach from which the Institution could potentially procure its entire requirement. '**N**' indicates that the procurement option is unsuitable.

Table 8 Procurement options applied against capability requirements for ICT infrastructure

Requirement	PPP	Volume contract	Supplier catalogue	Lease	Provincial	National	Best of breed	One-stop shop
Architectures	Y	N	N	N	N	Y	Y	Y
Design	Y	N	N	N	N	Y	Y	Y
Build	Y	Y	Y	Y	Y	Y	Y	Y
Deploy	Y	Y	Y	Y	Y	Y	Y	Y
Operate (schools competency)	–	–	–	–	–	–	–	–
Technology Support	Y	Y	Y	Y	Y	Y	Y	Y
User Support	Y	Y	Y	Y	Y	Y	Y	Y
Maintain	Y	Y	Y	Y	Y	Y	Y	Y
Enhance	Y	Y	Y	Y	Y	Y	Y	Y
Refresh	Y	N	Y	Y	Y	Y	Y	Y
Quality management	Y	Y	Y	Y	N	Y	Y	Y
Transfer	Y	–	–	Y	–	–	–	Y

2.8 ICT Infrastructure Build Requirements

The dominant ICT infrastructure build requirements are:

- For administration and management: LAN infrastructure, end-user devices (for example, desktop PCs and laptops), servers, printers, operating systems, productivity software, e-mail and browser capabilities, and other administrative applications.
- For learners and educators: LAN infrastructure, and managed end-user devices (for example, 'smart clients'), servers, printers, operating systems, educational software, and e-mail and browser capabilities. The managed end-user devices for learners may be placed in ICT laboratories or in alternative configurations (for example, mini-ICT laboratories or classrooms).

In both cases, there will be demands for other requirements (for example, electronic whiteboards or facsimile capabilities) that will only be determined at a later stage of the e-Education Initiative through each school's ICT Development Plan, but these neither constitute a major part of the anticipated procurement, nor do they represent a new class of acquisition. Accordingly, the total requirement falls into seven main groupings, being:

- End-user hardware and operating systems (typically acquired, maintained, upgraded, and disposed of as a unit);
- Printers and printing services;
- Servers and operating systems (again, typically acquired as a unit);
- LAN infrastructure (cabling, switches, network points, and so on);
- Productivity software, (e-mail, Internet browsers, word processors, spreadsheets, and the like);
- Educational software; and
- Other administrative software.

Review of procurement matters set out in this section against these build components shows no misalignment or material exception: Although certain areas are more likely to be serviced by niche suppliers (for example educational software and administrative software), these could be procured through other approaches (such as a PPP). However, in an event where the niche supplier may become a subcontractor to a consortium, the Institution would need to ensure supply risks are managed.

2.9 Recommended ICT Infrastructure Procurement Model

ICT Infrastructure will be deployed in two phases: the 'push' phase in which specified ICT components will be deployed to schools for administrative and administrative purposes and the 'pull phase'. There will be no single template for ICT Infrastructure deployment in the 'pull' phase. Each school and FET College will assess educator and learner requirements and, based on this, develop an ICT Development Plan. The school/ FET College will select appropriate technology to meet this plan's needs from a 'catalogue' that contains suitable options approved by the Institution.

After having considered the nature of ICT Infrastructure procurement implied by the phases of the e-Education Initiative, we conclude that a PPP does not present an attractive procurement methodology. The main arguments supporting this conclusion are:

- In the part of the -Education Initiative (the 'pull' phase) that has most significance[21] from a procurement perspective, there will be no fixed 'output specification' or requirement. Schools

[21] Volumes of ICT infrastructure in the 'push' phase will be low relative to the 'pull' phase. It would not be prudent, however, to use different procurement mechanisms for the two phases.

and FET Colleges will determine their own emphases, which may result in a substantial range of output requirements.

- Technology related to the ICT Infrastructure will evolve rapidly. Whilst it may be theoretically possible to define an output specification that will remain constant despite the evolution of technology, it is practically difficult to do so. Evolving technology presents new opportunities that, in turn, modify the ideal output specification over time. A PPP requires some degree of certainty as to output specification, which cannot be provided here.
- An additional factor relating to technology evolution is cost. Moore's law[22] that predicts both improved technology and declining costs has been consistently demonstrated over the last two decades. This creates high financial risks for any supplier and the Department. Unpredictability of future pricing and performance leads to a risk of poor value for money for the Institution on the one hand and failed suppliers through lack of profitability on the other.

The inability to be definitive about these matters indicates that, although these requirements would be met though partnerships between various service providers (public and private sector) and that the management of agreements should include some of the rigorous contracting principles of PPPs, the procurement mechanism would not be a PPP as defined in Treasury Regulation 16. Treasury Regulation 16 defines the phrase 'public private partnership' to mean a commercial transaction between an institution and a private party in terms of which, among other things, the private party assumes substantial financial, technical, and operational risk in connection with the performance of the institutional function and/or use of State property.

Because output specifications will not be fixed and each school and FET College will determine its own requirements and emphasis thereto, transfer of substantial technical risk may not be achievable. Furthermore, because ICT Infrastructure evolves rapidly and this may impact on costs, the assumption of substantial financial risk may not be achievable.

Legally, there is nothing that prohibits implementation of the procurement model within Treasury Regulation 16, provided that substantial technical and financial risk will be transferred to the private party and the e-Education Initiative remains affordable and there is also value for money. Further there is nothing in law that could prohibit the application of PPP principles in contracts that are not regulated by Treasury Regulation 16.

One of the significant challenges in developing a procurement strategy in respect of ICT Infrastructure is determining where the locus of procurement control should ideally be placed. Does a centralized procurement model present most benefits or will a decentralized policy produce better real value for money?

The commonly-stated advantages of centralized procurement are standardization, economies of scale, cost-effective access to skills, and better control, amongst others. Less positively, centralization is often cited as the cause of long lead times, communication misunderstandings between supplier and consumer, expensive supply chains, and more.

Decentralization offers almost the converse, with benefits of customer intimacy, greater sensitivity to local issues, supplier responsiveness, local 'ownership', and the like. Unfortunately, decentralization often encounters patchy control, non-standardization, poor cost control, and other disadvantages.

[22] …colloquially, 'bang per buck' doubles every 24 months' ,refer http://en.wikipedia.org/wiki/Moore's_law

For the e-Education Initiative, there is no single centralization/decentralization approach that can be applied. Instead, hybrid approaches will need to be considered for each of the procurement requirements and proposals are put forward in the table below. The table outlines a set of procurement proposals regarding ICT Infrastructure to implement the recommendations made in our Options Analysis and Due Diligence Report. Output specifications are presented that describe the products and/or services that need to be procured in order to implement the recommendation. For each output specification, an associated proposed procurement strategy is outlined, which takes into account the range of available procurement options presented for ICT Infrastructure.

As will be seen, we do not recommend a single procurement strategy. In a project of the scale and importance of the e-Education Initiative, procurement strategies are required that match the demands of each requirement.

The term 'outsourcing' is not used in the table below in the narrower context of traditional public sector approaches. The full spectrum of outsourcing options should be considered for each output, ranging from traditional government procurement approaches to third-party financing concepts. The emphasis on outsourcing will, however, be on arrangements that can be effectively and efficiently managed over the medium term.

Table 9 Procurement recommendations for ICT Infrastructure

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
1) **Architectures** in respect of Management and Administration (the enterprise-wide view of all ICT requirements and how they integrate, as well as the policies and standards that will guide construction of the architecture)	The national Department of Education is responsible for development of architectures.	*Outsourcing – private party* Procurement of expert consultancy services to develop the details of Architectures through open tender, complemented by consultation with relevant government agencies such as the DPSA and SITA. This is a short-term contract to develop architectures, followed by occasional review processes to ensure the architecture remains aligned to emerging needs of schools and suitably capitalizes on technology opportunities.	Contracts should be placed and managed centrally by the national Department of Education. This should not preclude provincial Departments of Education from participating as appropriate in processes associated with architectural development.	
2) **Design** in respect of Management and Administration (the detailed design of ICT infrastructure solutions)	The national Department of Education is responsible for defining output specifications (that is, the functionality and performance required by management and administration staff of schools).	*Outsourcing – private party* Procured as part of the 'build' requirement. Private parties are to be required to demonstrate that their proposed designs will meet the output specifications. Private parties are to update their designs to capitalize on emerging technology.	Contracts should be placed, and managed centrally by the national Department of Education. This should not preclude provincial Departments of Education from participating in processes associated with design development. Where there are unique requirements, it is anticipated that this process may result in some provincial variations.	Whilst multiple designs may be able to meet the output specification, it is recommended that significant variation be kept to a minimum in order to capitalize on economies of skill and scale.
3) Build and deploy a) **Build** in respect of Management and Administration	The national Department of Education is responsible for (i)	*Outsourcing – private party:* The responsibility for building and deployment should be incorporated into a single agreement. Within this context,	A procurement policy framework developed by the DoE should set out principles governing procurement	Product variations can be permitted provided each complies with

[23] Terms used here are more fully defined in Table 9 'ICT infrastructure capabilities to be procured'.

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
(acquisition of the specified requirements, including local area networking, desktop end-user devices for administrators, laptops for principals, and printers) b) **Deployment** in respect of Management and Administration (installation and implementation of the specified requirements in the target environments)	defining output specifications, that is the functionality and performance required by the management and administration staff of schools; and (ii) setting up frameworks for effective contract management.	bidders should be encouraged to use subcontractors to improve their geographical deployment footprint. Multiple outsourcing contracts are recommended to allow bidders the opportunity to propose in respect of one or more components (for example, local area network installation, printers and PCs) and to allow them to propose in respect of one, some, or all provinces or regions that cover parts of multiple provinces. Owing to the evolving nature of technology and its cost, medium term (3- 7 years) contracts are recommended. Procurement requirements should also encourage the building of capacity in rural and urban areas of South Africa. Contracts should require the private party to offer the DoE advantages of newer technology as it becomes available. Procurement disciplines associated with PPPs that are relevant to the proposed procurement regime should be incorporated into agreements.	agreements. Inter alia, this should identify those items that can sensibly be procured through national framework contracts. These will be high volume 'standard' items where purchasing power can be consolidated, for example, end-user devices and printers. Preferably, such contracts should not exclude regional supply channels and should contain provincial DoE 'call-off' mechanisms to allow provinces and district offices to effect procurement. Contract management should be a hybrid of centralized and provincially-based. Contracts for items where there is a need for local knowledge and support (or stimulating local industry) should be procured and managed provincially in accordance with a national framework of contract management standards.	standards set down by the national Department of Education. We recommend that provincial Departments of Educations play the primary role in the planning and timing of acquisition and deployment, within the context of a single plan coordinated by the national Department of Education.
4) **Operate** in respect of Management and Administration (daily	The school is responsible to ensure the ICT	*Insourced* This service will be done by the school that operate the ICT infrastructure. The scope of	*Not applicable* Owing to the nature of this service all activities will be	While this is a school responsibility,

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
availability of ICT infrastructure by ensuring routine ICT infrastructure management tasks are performed)	infrastructure are operational	such activities comprises actual use of ICT infrastructure by staff and learners in the course of educational and administrative activities, together with a small amount of routine 'housekeeping'. 'Housekeeping' includes such tasks as ensuring the inventory of ICT resources (computers, printers, and the like) is properly stored when not in use (for example, in locked storage or secure classrooms) and was not subject to ill-use, as well as ensuring that local data is kept secure (by, for example, performing data 'back-up' on a regular basis). Performance of these tasks and those of a similar nature would be guided by Departmental policy. In addition, the User Support activity (see next row) would provide local guidance for schools to assist them in setting-up such housekeeping practices, and provide assistance with any practical challenges experienced from time to time by the school.	performed at a school level.	district office and provincial support is essential. Although alternative regional structures could be considered for this support, it is recommended that emphasis be placed on building the capacity of, and resolving challenges experienced regarding, technology support in existing structures. Alternative structures could be regarded as being 'outside the system'. Because a key value in the e-Education Initiative is to see use of ICT as part of education and not as an adjunct, it is important to involve existing structures rather than create new ones.
5) **User Support** in respect	The national	*Outsourcing – private party*	The nature of these services	Provinces and

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
of Management and Administration (services that provide advice and guidance and other relevant services to users of the ICT infrastructure) While provinces (and their districts) will provide support to schools, this support can be expected to focus on management and exploitation of ICT capabilities. This requirement instead relates to day-to-day support of schools in their use of technology. Here, a structure of contact centres[24] is recommended rather than a single national 'help desk'. The structure would support the concepts of a) Various levels of support, including: frequently covered matters (that can be	Department of Education is responsible for (i) defining output specifications, that is the functionality and performance required of contact centres by the management and administration staff of schools; and (ii) setting up frameworks for effective contract management.	The architecture of user support services should, ideally, be determined as part of Requirement 1 (Architecture). An integrated nationwide approach to procuring support is recommended in order to capitalize on economies of skill and scale. The architecture is likely to be layered: for example, a national support centre, regional support, and local on-the-ground capacity. To facilitate this, multiple outsourcing contracts are expected, subject to architecture recommendations. These contracts would have linked obligations and would include: (i) national support centre, (ii) regional (or provincial) support centres, and (iii) local support abilities. Flexibility to allow bidders to propose for parts or all of each type of contract must be balanced against the complexities presented in managing service quality and suppliers. Owing to the critical nature of this type of service, medium term (3- 7 years) contracts with well-constructed termination provisions are recommended. Procurement requirements should encourage building of capacity in rural and urban areas of South Africa.	requires some national activities whilst other activities are provided regionally or at schools. National services should be acquired and managed by the national Department of Education. Regional services should be procured and managed by provincial Departments of Educations in accordance with a national framework of contract management standards if the preferred suppliers supply on a provincially-aligned basis. Where preferred suppliers supply on a regional basis that is not province-specific, the specific conditions should be considered to determine if this should be management by a nominated province or at a national level. These services will require an effective contract management governance structure to ensure robust	districts will need to be capacitated to perform their key role in monitoring quality and effectiveness of support services.

[24] The use of 'Contact Centre' rather than Help Desk is deliberate. The structure must be cost-effective, and effectiveness of the service will depend on it having good and practical knowledge of schools environments. The service must be seen as a point of contact for schools to get advice in context rather than a 'help desk' that focuses on technology support alone.

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
addressed in the most cost efficient manner), matters requiring local knowledge or advanced levels of technical knowledge, remote telephone or e mail support, and on-site assistance; b) Nationally and regionally-based support.		Procurement disciplines associated with PPPs that are relevant to the proposed procurement regime should be incorporated into agreements.	integration of national, regional, and local services.	
6) **Maintain** in respect of Management and Administration (services required to keep the deployed ICT infrastructure operating in accordance with its specifications)	The national Department of Education is responsible for (i) defining the output specification, that is the service levels required in respect of each type of component (local area network, printer, PC, etc), including, for example, time to respond, time to repair, down time and the like; and (ii) setting up frameworks for effective contract	*Outsourcing – private party* An integrated nationwide approach to procuring maintenance is recommended, in order to capitalize on economies of skill and scale. The architecture is likely to be similarly layered but for different reasons: a national capability exists for most complex problems, regional support attends to matters that cannot be resolved by front-line staff, and local on-the-ground capacity attends to routing incidents. Their operation is coordinated via the contact centres referred to in (5) above. Multiple outsourcing contracts are expected and these should, where practical, include links to the original equipment manufacturer or supplier (i.e. the supplier(s) selected under (3) above.	Maintenance services may be acquired for original manufacturers or suppliers or may be acquired from third parties. This will be determined by which bidder or bidders' proposal(s) most effectively meets all of the Institution's needs. Where original manufacturers or suppliers are selected, mirroring the approach to centralization and decentralization proposed in (3) above is recommended. Where alternative suppliers are selected, certain items of maintenance can sensibly be procured through national	Provinces and districts will need to be capacitated to perform the key role of monitoring quality and effectiveness of maintenance services.

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
	management.	Contracts at national, regional and local levels should be linked in order to assure continuity of service and service quality. As in the case of support services, flexibility to allow bidders to propose for parts or all of each type of contract must be balanced against the complexities presented in managing service quality and suppliers. Owing to the critical nature of this type of service, medium term (3- 7 years) contracts with well-constructed termination provisions are recommended. Procurement requirements should encourage building of capacity in rural and urban areas of South Africa. Procurement disciplines associated with PPPs that are relevant to the proposed procurement regime should be incorporated into agreements.	framework contracts. Such contracts should not exclude regional supply channels and should contain provincial Department of Education management mechanisms to allow provinces and District Office to effect procurement of services. Contract management should be coordinated nationally, but should incorporate a strong provincial element. Local knowledge should be procured and managed provincially in accordance with a national framework of contract management standards.	
7) **Enhancements** in respect of Management and Administration (addressing emerging requirements that result in an amendment of then-current specifications).	The national Department of Education is responsible for defining the requirements in terms of an enhancement regime. This will be largely driven by its application systems	*Outsourcing – private party* The party responsible for provision of the to-be-enhanced ICT Infrastructure component should also be responsible for relevant enhancements. Accordingly, this should be incorporated in arrangements set out under (3) above.	See (3) above.	Management of enhancement always presents challenges. These can be minimized with well-defined applications systems and output architectures. Governance mechanisms

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
	architectures and by setting up frameworks for effective contract management.			covering the national Department of Education and the provincial Departments of Educations are recommended to manage enhancement. This will avoid unnecessary proliferation of variants on software and hardware.
8) **Refresh** in respect of Management and Administration (replacement of existing ICT infrastructure when it reaches the end of its economic life)	Refresh rates can significantly affect costs of ownership. Whilst bidders will be asked to propose refresh rates, the national Department of Education will be responsible confirming or amending the proposals. These will include refresh rates for hardware and software (e.g. four years for administrative desktop PCs). The national DoE should	*Outsourcing – private party* The party responsible for provision of the ICT Infrastructure component should also be responsible for Refresh. Accordingly, this should be incorporated in arrangements set out under (3) above.	See (3) above	

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
	also set out its policy in respect of retired equipment (for example, use as 'managed clients', donations to NGOs, 'green' disposal, etc).			
9) **Quality management** in respect of Management and Administration. (activities that aim to maintain and improve quality) Quality management will cover delivery (for example, performance and capacity management, and service management), suitability and improvement of services for users.	The national Department of Education will be responsible for (i) ensuring suppliers' quality management policies are consistent with the Department's policies; and (ii) implementing a quality audit regime.	*Outsourcing – supplier and e-Unit* The e-Unit is further discussed in the governance section of this report. The parties responsible for supply of services set out above can reasonably be expected to have, and comply with, quality management policies. Consequently, a significant part of quality management services are recommended to be outsourced with the relevant outsourced arrangement. In addition, however, there is a requirement for the quality of suppliers' quality management to be audited. This activity may be *Insourced*, but it is recommended that this is *Outsourced* by incorporation into the duties of the e-Unit.	This contract should be awarded and managed nationally. As noted in the linked recommendations, it is essential that the contract award and management mechanisms involve provincial Departments of Education to ensure support for quality management principles, objectives, and management.	Provinces' and districts' role in monitoring the quality and effectiveness of services will need to be coordinated with the activities of the e-Unit.
10) **Transfer** in respect of Management and Administration (transfer of ownership of ICT infrastructure to the Institution)	This requirement will arise only if a supplier proposal selected by the Institution is one in which ownership of assets is not transferred on acquisition. This could arise if a lease	*Outsourcing – private party* This requirement should be incorporated into arrangements set out under (3) above.	See (3) above.	

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
	option is selected.			
11) **Architectures** in respect of Educators and Learners (the enterprise-wide view of all ICT requirements and how they integrate, as well as the policies and standards that will guide construction of the architecture)	The national Department of Education is responsible for development of architectures.	*Outsourcing – private party* Architectures for teaching and learning are likely to be more dynamic than those for Administration and Learning owing to the wider variety of technologies and evolution of requirements. Architectures will also be 'looser': each school's actual usage of technology will be in accordance with a 'pull' strategy that allows them to select and integrate components from approved ranges. This means that the architecture will need to be created and then monitored on an ongoing basis to ensure that offerings from suppliers will interoperate in the school. Procurement of expert consultancy services to develop the details of Architectures through open tender is recommended, complemented by consultation with relevant government agencies such as the DPSA and SITA. This would be a short-term contract to develop Architectures. Ongoing management and updating of the Architectures, including approved ICT components, should be managed by the e-Unit. The e-Unit's review processes should also ensure that the Architectures suitably capitalize on technology opportunities.	Owing to the nature of this service, contracts should be placed, and managed, centrally by national Department of Education. This should not exclude provincial Departments of Education's participation in processes associated with architectural development.	
12) **Design** in respect of Educators and Learners (detailed design of ICT infrastructure solutions)	The national Department of Education is responsible for	*Outsourcing – private party* In the outsourcing of the build and deploy requirement (see row 13), a determination must be made that the relevant components	As with Management and Administration, contracts should be placed with and managed centrally by the	

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
	ensuring that approved ICT components meet required standards and are interoperable.	are compliant with technology and interoperability standards. The Department should use a specialist third party selected by open tender for this verification process. The scope should include initial assessment and occasional reviews.	national Department of Education.	
13) Build and deploy a) **Build** in respect of Educators and Learners (acquisition of the specified requirements, including local area networking and a range of approved equipment selected by schools/FET Colleges in terms of their ICT Development Plans; and b) **Deployment** in respect of Educators and Learners (installation and implementation of the specified requirements in the target environments).	The school/FET College is responsible for determining its requirements in terms of its ICT Development Plan. The national Department of Education is responsible for setting up a contract management regime that facilitates cost-effective procurement for schools/FET Colleges.	*Outsourcing – private party* Responsibility for Build and Deploy should be incorporated into a single agreement. Within this context, bidders should be encouraged to use subcontractors to improve their geographical deployment footprint. Multiple contracts are recommended to allow bidders the opportunity to propose in respect of one or more components (for example, local area network installation, printers and PCs) and to allow them to propose in respect of one, some, or all provinces or regions that cover parts of multiple provinces. Owing to the evolving nature of technology and its cost, medium term (3- 7 years) contracts are recommended. Procurement requirements should encourage the building of capacity in rural and urban areas of South Africa. Contracts should require the private party to offer the DoE advantages of newer technology as it becomes available. Procurement disciplines associated with	The principles articulated in respect of Management and Administration apply equally here. In summary, a hybrid of contracts led and managed by the national Department of Education and contracts arranged by provincial Departments of Education is proposed. The exact nature of the hybrid should be determined only in the procurement phase of this project when the supply solutions that best meet the Department's needs are assessed. We recommend that national Department of Education and provincial Departments of Education contract management occur in accordance with a policy framework developed by the national Department of Education. This will facilitate	Product variations can be permitted provided each complies with standards set down by the national Department of Education. Provincial Departments of Educations are recommended to play the primary role in planning and timing of acquisition and deployment, within the context of a national plan coordinated by the national Department of Education. Provincial Departments of Educations and District Offices need to be capacitated to provide advice and

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
		PPPs that are relevant to the proposed procurement regime should be incorporated into agreements. Procurement agreement structures will vary according the nature of component concerned. For example, a contract for the supply of a wide range of optional components is likely to be catalogue-based (that is pre-agreed local pricing and conditions, but no specific. committed volumes) whilst a contract for classroom-based user devices may be include commitments on volume, cost, and exchange-rate cover.	effective integration of the management of suppliers and contracts for best results. There is a need for local knowledge and support (or stimulating local industry), which should be procured and managed provincially in accordance with a national framework of contract management standards.	guidance to each school and FET College regarding its ICT Development Plan.
14) **Operate** in respect of Educators and Learners (daily availability of ICT infrastructure by ensuring routine ICT infrastructure management tasks are performed)	The school/ FET College is responsible to ensure the ICT infrastructure are operational	*Insourced* This service will be done by the school/ FET College that operate the ICT infrastructure. As with schools, the scope of such activities comprises actual use of ICT infrastructure by staff and learners in the course of educational and administrative activities, together with a small amount of routine 'housekeeping'. 'Housekeeping' includes such tasks as ensuring the inventory of ICT resources (computers, printers, and the like) is properly stored when not in use (for example, in locked storage or secure classrooms) and was not subject to ill-use, as well as ensuring that local data is kept secure (by, for example, performing data 'back-up' on a regular basis).	Not applicable Owing to the nature of this service all activities will be performed at a school/ FET College level.	Whilst this is a school/FET College responsibility, District Office and Provincial support will be essential. As with Management and Administration above, it is recommended that emphasis be placed on building the capacity of, and resolving challenges experienced regarding, technology support

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
		Owing to the more advanced nature of FET Colleges, it is probable that a more complex use of technology will evolve in some, if not all, FET colleges. In more complex cases, housekeeping responsibilities will also become more challenging. This will require development of more advanced ICT housekeeping skills. It is likely that such skills will evolve at the FET College alongside the more advanced use. However, it will be prudent to ensure, through Support services that the level of skill matches the technology requirement. Usage and housekeeping matters would be guided by the Departmental policy. The User Support activity (see next row) would provide local guidance for Colleges to assist them in setting up such housekeeping practices, and provide assistance with any practical challenges experienced from time to time by the College.		in existing structures.
15) **User Support** in respect of Educators and Learners (services that provide advice, guidance, and other relevant services to users of the ICT infrastructure)	The national Department of Education is responsible for (i) defining output specifications, i.e. the functionality and performance required by the Educators and	*Outsourcing – private party* We recommend that the support structures noted in terms of Management and Administration (Row 5) be used for this user support requirement. This will provide a single point of contact for the school/FET College.	The centralization / decentralization of these services should be dealt with in the same manner as used for Management and Administration. It is important that there is a single approach to allocation and contract management of all support services for schools and FET	Provinces and districts will need to be capacitated to perform the key role of monitoring the quality and effectiveness of support services.

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
	learners at schools/FET Colleges; and (ii) setting up frameworks for effective contract management.		Colleges.	
16) **Maintain** in respect of Educators and Learners (the services required to keep the deployed ICT infrastructure operating in accordance with its specifications)	The national Department of Education is responsible for (i) defining the output specifications, i.e. the service levels required in respect of each type of component (local area network, printer, learner end user device, etc), including, for example, time to respond, time to repair, down time and the like; and (ii) setting up frameworks for effective contract management.	*Outsourcing – private party:* We recommend that maintenance structures noted in terms of Management and Administration (Row 6) be used for this requirement.	As for User Support, the centralization / decentralization of these services should be dealt with in the same manner as used for Management and Administration and for the same reasons.	Provinces and districts will need to be capacitated to perform the key role of monitoring quality and effectiveness of support services.
17) **Enhancements** in respect of Educators and Learners (addressing emerging requirements that result in	The national Department of Education is responsible for	*Outsourcing – private party* The approaches recommended in terms of Management and Administration also apply here.	See (13) above.	Governance mechanisms covering the national Department

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
an amendment of then-current specifications).	setting out an enhancement policy and governance structure and setting up frameworks for effective contract management.			of Education and the provincial Departments of Educations are recommended to manage enhancement. This will avoid unnecessary proliferation of variants on software and hardware.
18) **Refresh** in respect of Educators and Learners (replacement of existing ICT infrastructure when it reaches the end of its economic life)	The national Department of Education is responsible for defining requirements in terms of technology refresh.	*Outsourcing – private party* The approaches recommended in terms of Management and Administration also apply here.	See (13) above.	
19) **Quality management** in respect of Educators and Learners (activities that aim to maintain and improve quality)	The national Department of Education will be responsible for ensuring that suppliers' quality management policies are consistent with the Department's policies and for implementing a quality audit regime.	*Outsourced – supplier and e-unit* The approaches recommended in terms of Management and Administration also apply here.	This contract should be awarded and managed nationally for the same reasons as set out under this service for Management and Administration.	Provinces' and districts' role in monitoring the quality and effectiveness of services will need to be coordinated with the activities of the e-Unit.

Requirement[23]	Policies and Norms	Proposed Procurement Strategy	Centralization/ decentralization	Linked Recommendation
20) **Transfer** in respect of Educators and Learners (transfer of ownership of ICT infrastructure to the Institution).	This requirement will arise only if the supplier proposal selected by the Institution is one in which ownership of assets is not transferred on acquisition. This could arise if a lease option is selected.	*Outsourcing – private party* The approaches recommended in terms of Management and Administration also apply here.	See (13) above.	

3 Connectivity

3.1 Introduction

Procurement considerations are detailed below in terms of:

1) The key connectivity capabilities that the Institution must procure in order to support the e-Education Initiative options;
2) The entities that can contribute to achievement of the required capabilities, some of which are within the Institution and others outside;
3) Third party procurement approaches;
4) Different approaches to procurement;
5) Suggested applicability of the procurement approaches to the elements of the connectivity; and
6) An assessment of each material connectivity 'build' requirement to determine if there are exceptions to the directions suggested in this section.

3.2 Connectivity Capabilities

The e-Education Initiative calls for procurement of a range of capabilities, the most important of which are summarized in the table below.

Table 10 Connectivity capabilities to be procured

Capability	Description
Architectures	The enterprise-wide view of all business ICT requirements and how they integrate, as well as policies and standards that will guide construction of the architecture. Architecture elements for connectivity include, for example, network services architectures, VPN architectures, and physical network architectures. The same architecture portfolio will cover both ICT infrastructure and connectivity.
Design	Design of connectivity solutions. This will cover the physical layers (for example, last-mile connectivity options) and logical layers (including design of connectivity-related services, security design, capacity plans, and the like).
Build	Acquisition of the specified requirements. In the case of connectivity, this may occur through bespoke development and acquisition of some or all network components and services or may occur through modification and/or enhancement of existing network facilities.
Deploy	Installation and implementation of the specified requirements in the target environments. It includes, for example, deployment of VPN capabilities and network services, as well as installation of last-mile connectivity services. Technical and limited user training, facilitating user-adoption, change management, project management, and post-deployment reviews must be considered.
Operate	Ensuring daily availability of connectivity by ensuring that routine connectivity management tasks are performed. Examples are routine checks, network monitoring, troubleshooting, and security management.
Technology Support	Services that provide technology support to schools and/or the Institution in the event of technology failures.
User Support	Services that provide advice, guidance, and other relevant services to users of the connectivity infrastructure.
Maintain	Services required to keep the deployed connectivity operating in accordance with its specifications. This may include both reactive and proactive maintenance.

Enhance	Addressing emerging requirements that result in an amendment of then-current specifications, for example, increased bandwidth, improved quality, or additional network services.
Refresh	Replacement of existing network infrastructure, services, or parts thereof when they reach the end of their economic life.
Quality management	Activities that aim to maintain and improve connectivity quality, for example, network performance and capacity management, and improvement of services for users.
Transfer	Transfer of ownership of connectivity infrastructure to the Institution. This may happen on deployment or may occur only at the end of a defined contract term.

3.3 ICT Capability Sources

The main players who could play a role in delivery of connectivity capabilities are:
- The Department of Communications through its various initiatives;
- The national Department of Education through its existing Education VPN;
- Provincial administrations through their existing network infrastructures;
- SITA through the Next Generation Network (NGN) and other connectivity offerings;
- Other State-owned enterprises such as Infraco, Neotel, and Sentech; and
- The private sector, through provision of both WAN backbone and last-mile services.

As with ICT infrastructure, there several permutations regarding the manner in which the players can deliver the capabilities.

3.4 Procurement Options outside the Institution

Procurement options outside the Institution fall into three groups. They are:
- State agencies, notably the SITA, Department of Communications, and Infraco;
- Provincial connectivity services; and
- Private sector organizations.

Each is discussed further in this section.

3.4.1 State Agencies

Where connectivity services are acquired by the Institution for its own use, the Institution is required to use SITA for service provision, unless the procurement falls under National Treasury Regulation 16 or ministerial exemption has been provided. As with ICT infrastructure, the SITA Act as amended and regulation thereto do not state a specified role in regard to schools. However, their general mandate suggests that the organization can be approached to provide connectivity services relating to schools. SITA has already provided VPN services for FET Colleges.

3.4.2 Provincial ICT Competencies

Some provinces have access to existing network infrastructure. One example can be found in Gauteng, where the Gauteng Shared Service Centre (GSSC) has existing connectivity services. There is, therefore, a base on top of which the e-Education Initiative could potentially build in such provinces. In addition, municipal networks are developing and may provide part of the connectivity solution for urban schools. As with ICT infrastructure, capabilities and opportunities differ across provinces.

3.4.3 Private Sector

There is an increasing number of service providers in the connectivity space. This number can be expected to grow further. The following table summarizes the types of connectivity provider that may be able to meet part or all of the Institution's needs.

Table 11 Private sector organizations from which connectivity can be procured

Organization	Description
Countrywide corporate sector	These are the networking companies that have a countrywide footprint and could be in position to meet the Institution's needs. This group includes dominantly-wired services such as Telkom, as well as wireless services such as MTN, Vodacom, Motorola, and others. Benefits include the potential of 'ready-to-roll' capability.
Provincial SA corporate sector	These are the networking service providers (for example, Internet Service Providers) that use larger organizations' network infrastructure to provide services that focus on specific provinces.
Niche SA commercial organizations	These are organizations that provide only a narrow range of services or products. They may also be geographically limited, for example offering services in Gauteng or Cape Town, but not both.
Consortia	Consortia can be formed to provide a full portfolio of connectivity services. As with ICT infrastructure, consortia bring together a diversity of skills from other organizations and focus them through a special purpose entity.

3.4.4 Sectoral Capacity

The network service requirements presented by the Department's requirements are, for the large part, new. This places different demands on the connectivity 'market' from a situation where existing demand is being moved from one supplier to another. In addition, the Department's requirements are substantial. Accordingly, it is realistic to expect that neither public nor private sector suppliers will have immediate capacity to provide services. Whether the supplier is a private sector consortium or, for example, SITA, this means that a pragmatic and realizable capacity-building strategy will be an essential precursor to commitment by the Department.

3.5 Procurement Approaches

This section sets out procurement approaches that may be viable for all or some of the connectivity requirement. These approaches are not mutually exclusive: combinations and variants are possible. As certain options are fully described in the ICT infrastructure section of this document, this section provides only an outline of feasible options.

Table 12 Connectivity procurement approaches

Procurement approach	Description
PPP	A PPP typically brings together resources that can deliver outputs specified by the public entity. To meet connectivity requirements, it is likely that the PPP would be required to 'design-build-operate-maintain-transfer' as a minimum.
Volume contract	In this option, the Institution determines its anticipated connectivity and service requirements. A tender will contain the Institution's anticipated bandwidth

Procurement approach	Description
	requirements, services and service levels, last-mile requirements, and the like.
Supplier catalogue	In this option, the Institution develops a catalogue of service and product requirements and puts the catalogue out to tender. This type of arrangement is more difficult for connectivity services, as there is a considerable fixed cost in providing a dedicated network service, with each additional user or bandwidth requirement having a relatively small impact on costs. A supplier catalogue approach may result in suppliers weighting the pricing of low usage volumes to cover their cost risks. The approach is, however, feasible and should be considered.
Lease	This option provides the Institution with only the beneficial use of the connectivity assets.
Provincial	This option allows each province to undertake its own procurement, probably within national policy and standards. Provincial procurement may be better able to support provincial objectives than national procurement. This might be done, for example, by integrating connectivity services in a community so that school bandwidth can be effectively used outside school hours for other community purposes. By meeting a wider range of community requirements, network redundancy may become more affordable.
National	Service or goods are procured through a single national agency, for example, the Institution and SITA.
Best-of-breed	'Best-of-breed' requires the Institution to identify the best supplier for each product or service.
One-stop shop	One-stop shop is the opposite of best of breed. In this instance, suppliers are selected based on their ability to manage and integrate supply of products and services.

3.6 Applicability of non-Institution Procurement Options for Institutional Capabilities

The following table suggests entities that can be a practical source from which the Institution can procure connectivity capabilities. In this table 'Y' notes an option from which the Institution could potentially procure its entire requirement whilst 'P' suggests a part-capability. 'N' indicates that the procurement option is unsuitable.

Table 13 Applicable procurement options for connectivity

					Corporate sector			
	SITA	**DoC**	**Infraco, etc.**	**Provinces**	**Countrywide**	**Provincial**	**Niche organizations**	**Consortia**
Architectures	Y	P	Y	P	Y	P	P (niche aspects)	Y
Design	Y	p	Y	P	Y	P	P (niche aspects)	Y
Build	Y	N	Y	P	Y	P	P	Y
Deploy	Y	P	Y	P	Y	P	P	Y
Operate	Y	N	Y	–	Y	P	P	Y
Technology Support	Y	N	Y	P	Y	P	P	Y
User Support	Y	N	Y	P	Y	P	P	Y
Maintain	Y	N	Y	P	Y	P	P	Y
Enhance	Y	N	Y	P	Y	P	P	Y

					Corporate sector			
	SITA	**DoC**	**Infraco, etc.**	**Provinces**	**Countrywide**	**Provincial**	**Niche organizations**	**Consortia**
Refresh	Y	N	Y	P	Y	P	P	Y
Quality management	Y	P	Y	P	Y	P	P	Y
Transfer	Y	N	Y	N	Y	P	P	Y

The following table suggests potential types of procurement that could be applied to each capability requirements.

Table 14 Procurement options applied against capability requirements for connectivity

	PPP	**Volume contract**	**Supplier catalogue**	**Lease**	**Provincial**	**National**	**Best of breed**	**One-stop shop**
Architectures	Y	Y	N	N	N	Y	Y	Y
Design	Y	Y	N	N	Y (provincial network integration)	Y	Y	Y
Build	Y	Y	Y	Y	Y	Y	Y	Y
Deploy	Y	Y	Y	Y	Y	Y	Y	Y
Operate	Y	Y	–	–	Y	Y	Y	Y
Technology Support	Y	Y	Y	Y	Y	Y	Y	Y
User Support	Y	Y	Y	Y	Y	Y	Y	Y
Maintain	Y	Y	Y	Y	Y	Y	Y	Y
Enhance	Y	Y	Y	Y	Y	Y	Y	Y
Refresh	Y	N	Y	Y	Y	Y	Y	Y
Quality management	Y	Y	Y	Y	N	Y	Y	Y
Transfer	Y	–	–	Y	–	–	–	Y

3.7 Connectivity Build Requirements

The dominant connectivity build requirements fall into two main groupings, being:

- 'Last-mile' connectivity (that connects all schools to the WAN backbone); and
- WAN backbone and VPN connectivity (that provides access to the national and provincial Departments of Education and systems, as well as the Internet);

A review of procurement matters set out in this section against these build components shows no misalignment or material exception: Although certain areas are more likely to be serviced by niche suppliers (for example educational the Last-mile connectivity), these could be procured through other approaches (such as a PPP). However, in an event where the niche supplier may become a subcontractor to a consortium, the Institution would need to ensure that supply risks are managed.

3.8 Recommended Procurement of Solution

The table below outlines procurement proposals regarding Connectivity to implement the recommendations made in our Options Analysis and the Due Diligence Report. The three principal outputs are a WAN backbone, VPNs, and Last-mile Connectivity. Output specifications are presented that describe the products and/or services that need to be procured in order to implement

the recommendation. For each output specification, an associated proposed procurement strategy is outlined below, which takes into account the range of available procurement options presented for WAN Backbone, VPNs, and Last-mile Connectivity.

Table 15 Procurement recommendations for Connectivity

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
1) **Architectures** in respect of WAN Backbone and VPNs (the enterprise-wide view of all WAN Backbone requirements and how they integrate, as well as policies and standards that will guide construction of the architecture)	The national Department of Education is responsible for development of architectures.	*Public-Public Partnership* Use of the SITA Next Generation Network is the recommended basis for WAN backbone. Because of the criticality of this service, the substantial size of the commitment, and the need for capacity building, it is recommended that this service not be procured under the Department's existing arrangement with SITA, but that it is instead procured in terms of a Public-Public Partnership. This will allow for development of an agreement that would suitably protect school education interests by providing necessary guarantees. In this context, architectures would be developed by the Public Partner. Depending on the nature of the Public-Public Partnership provisions, it is recommended that the Department also procure the services of a specialist third party to provide an independent assessment of the viability of SITA Architectures. The third party may be another government agency or a private party.	The nationally integrated aspects of delivery of this service require that contracts should be placed at, and managed centrally by, the national Department of Education. As with other architectures, this should not preclude provincial Departments of Education from participating in processes associated with architectural development.	The e-Unit should have a material role in assurance of the Architectures. A sub-unit is recommended that would focus entirely on WAN services.

[25] Terms used here are more fully defined in Table 9 'ICT infrastructure capabilities to be procured'

[26] This recommendation is not in line with the SITA Act , particularly sec 7(4)(a)(i) & (b), which provide for the mandatory role of SITA. It is not within the framework of the Act to position SITA to compete with private parties. For the recommendation to stand in law the SITA Act will have to be amended to enable SITA to be involved in a competitive bidding process.

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
		In terms of the VPNs procurement should be through SITA unless value-for-money analysis proves otherwise. In terms of **VPNs** it is recommended that the Department issue the procurement documentation to both SITA and the private sector[26]. This will allow the Department to evaluate the SITA offering (as the PSC) against the private sector bids (as the customized PPP) and determine which provides the best Value for Money. The SITA offering will be based on the recommended service delivery option as detailed in the Due Diligence report and the private sector bids will be based on the recommended service delivery option as per the Options Analysis report.		
2) **Design** in respect of WAN Backbone and VPNs (detailed design of the WAN)	The national Department of Education is responsible for defining output specifications, that is the functionality and performance required of the WAN Backbone.	*Public-Public Partnership* As set out in (1) above, including third party assessment.	For the same reasons as with WAN Backbone Architecture, this service requires that contracts should be placed at, and managed centrally by, the national Department of Education.	The e-Unit's WAN sub-unit should be capacitated to provide assurance regarding designs.

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
3) **Build and deploy** a) **Build** in respect of WAN Backbone and VPNs (acquisition of the specified requirements); and b) **Deployment** in respect of WAN Backbone and VPNs (installation and implementation of the specified requirements in the target environments)	The national Department of Education is responsible for defining output specifications (that is the functionality and performance required of the WAN Backbone) and setting up frameworks for effective contract management.	*Public-Public Partnership* As set out in (1) above.	The principle of a single WAN backbone demands that the national Department of Education award the agreement and manage the Partnership. Contract management should have a cascaded governance structure to provide a voice to provincial Departments of Educations in setting requirements, in key contract provisions, and in certain contract management activities.	The e-Unit's roles would include consolidating service requirement information, planning, monitoring service delivery, and managing variances from target qualities. It would provide a coordinating focus for the national Department of Education and provincial Departments.
4) **Operate** in respect of the VPNs and WAN Backbone (daily availability of WAN infrastructure by ensuring that routine tasks and services are performed)	The national Department of Education is responsible for ensuring the WAN Backbone operational service is effectively supplied, by setting out service requirements and ensuring there is a suitable service monitoring regime.	*Public-Public Partnership* As set out in (1) above	This service would be part of the Partnership. Accordingly, the same approach to centralization and decentralization would apply.	The e-Unit's roles would include monitoring performance and operational service levels.
5) **User Support** in respect of	The national	*Public-Public Partnership*	This service would be part	Provinces will need

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
WAN Backbone and VPNs (services that provide advice, guidance, and other relevant services to users of the WAN Backbone and VPNs) This service is not a day-to-day requirement in respect of schools. Advisory and guidance services regarding the WAN backbone will primarily relate to exploitation, planning, and performance management issues (for example, advice on changing capacity or priorities for data across the network). This type of guidance will be required at a multi-school, rather than single school, level, and will be delivered at both national and provincial levels. Because of the detailed nature of this type of support, it can be expected to be provided directly through consultative support rather than a contact centre.	Department of Education is responsible for defining a framework that will allow for clear channels of communication regarding user support at National and Provincial Levels and managing its consequences (also see Enhance).	As set out in (1) above	of the same Partnership as the Operate service. Accordingly, the same approach to centralization and decentralization would apply.	to be capacitated to participate effectively in matters relating to the WAN backbone. We recommend that the e-Unit should coordinate support interactions with the Public Partner.
6) **Maintain** in respect of	The national	*Public-Public Partnership and Outsourcing*	This service would be part	Whilst Provinces

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
WAN Backbone and VPNs. (services required to keep the deployed WAN Backbone operating in accordance with its specifications) Effective delivery of this service is dependent on formal communication channels that allow for schools, districts, and Provincial or National Departments to report problems, such problems to be progressed (and expedited or escalated as required), and the problems to be resolved. It is recommended that this matter be managed via a single communication channel and, thus, be combined with the contact centres for ICT infrastructure maintenance and support.	Department of Education is responsible for defining output specifications, that is the service levels required in respect of the components of the WAN Backbone (for examples, data transmission quality, virus and firewall services, internet site filtering, and so on). Service levels will vary according to type of service. The national Department of Education would also be responsible for setting up a framework for effective service level management.	The maintenance requirement should be covered in the arrangement envisaged in (1) above. The contact centre service should be procured as set out in (5) of Table 15.	of the same Partnership as the Operate service. Accordingly, the same approach to centralization and decentralization would apply.	will need to be capacitated to effectively participate in matters relating to the WAN backbone, we recommend that the e-Unit should play the primary role in managing the quality of maintenance services.
7) **Enhancements** in respect of WAN Backbone and VPNs (addressing emerging requirements that result in amendment of then-current	The national Department of Education is responsible for determination and effective operation	*Public-Public Partnership* As set out in (1) above.	This service would be part of the same Partnership as the Operate service. Accordingly, the same approach to centralization and decentralization would	Governance covering the national Department of Education and provincial Departments is

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
specifications)	of governance structures that will manage demands to increase network capacity. The national Department is also responsible for developing usage policies that will prevent unwarranted growth.		apply.	recommended to manage changes in network capacity. However, detailed monitoring and management of capacity would be undertaken by the e-Unit.
8) **Refresh** in respect of WAN Backbone and VPNs (replacement of existing WAN Backbone infrastructure when it reaches the end of its economic life)	The national Department of Education is responsible for defining the WAN Backbone output requirements from time to time. These may lead to refresh activities occurring earlier than scheduled. As with ICT infrastructure, the national Department should confirm that the Public Party's policy for disposal of redundant WAN Backbone infrastructure is in	*Public-Public Partnership* As set out in (1) above.	This service would be part of the same Partnership as the Operate service. Accordingly, the same approach to centralization and decentralization would apply.	Detailed monitoring and management of this activity would be undertaken by the e-Unit.

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
	line with its own policy.			
9) **Quality management** in respect of WAN Backbone and VPNs (activities that aim to maintain and improve quality)	The national Department of Education is responsible for confirming that the Public Party's quality policy is acceptable and for establishing mechanism to audit compliance.	*Public-Public Partnership* As set out in (1) above.	This service would be part of the same Partnership as the Operate service. Accordingly, the same approach to centralization and decentralization would apply.	Whilst quality management is the responsibility of the supplier, a strong audit role is recommended. This would be undertaken by the e-Unit. The e-Unit will require strong channels of communication with provincial Departments of Education and, through them, Districts and schools to ensure thorough quality audits.
10) **Transfer** in respect of WAN Backbone and VPNs (transfer of ownership of WAN Backbone and VPNs to the Institution) We do not recommend that the Department aim to 'own' the WAN Backbone. This is not part	Not required	Whilst transfer of WAN Backbone assets to the Department is not required, the Department may choose to change its WAN Backbone supplier (at the end of the agreement's term or earlier). To cover risks associated with this event, agreement with the Public Party should cover the Department's rights in regard to transferring Public Party staff, as well as hard and intellectual property assets, to its new provider.	This is a contract termination event, and should be managed by the national Department of Education. Provincial Departments would participate in management of the process to the extent required by the contract's exit management plan.	Any transfer on termination of an agreement with the Public Party should be managed by the e-Unit on the Department's behalf.

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
of the Department's core activity, and would require skills that the Department is unlikely to be able to retain. The WAN Backbone should be seen as a service.				
11) **Architectures** in respect of last-mile connections. (The enterprise-wide view of all last-mile connection services and how they inter-relate, as well as the policies and standards that will guide construction of the architecture) Owing to the nature of last-mile connections,[27] the infrastructure will not frequently be shared between schools. Architectures will, here, be concerned with, for example, the types of last-mile technologies and their applicability to different situations, as well as integration with other local government service requirements.	The national Department of Education is responsible for development of Architectures.	*Outsourcing – private party* Procurement of expert consultancy services to develop the details of architectures through open tender is recommended, complemented by consultation with relevant government agencies such as the DPSA and SITA. This is a short-term contract to develop architectures followed by occasional review processes to ensure the architecture remains aligned to the emerging needs of schools and suitably capitalizes on technology opportunities.	Owing to the nature of this service, contracts should be placed with, and managed centrally by, the national Department of Education. This should not preclude provincial Departments of Education from participating in processes associated with architectural development.	The e-Unit should play a material role in assurance of the Architectures. A sub-unit is recommended that would be focused entirely on WAN services.

[27] The term 'last-mile' can be misleading. This is the connection between the school and the nearest point of the WAN Backbone. The last-mile can be many kilometers in length.

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
12) **Design** in respect of last-mile connections (detailed design of last-mile connections solutions)	The national Department of Education is responsible for stating output specifications and any design principles that must be met by supplier designs, for example security standards.	*Outsourcing – private party* This service should be procured as part of the 'build' requirement. Private parties should be required to demonstrate that their proposed designs will meet the output specifications. Private parties are to update their designs to capitalize on emerging technology.	See (13) below.	The e-Unit's WAN sub-unit should be capacitated to provide assurance regarding designs
13) Build and deploy a) **Build** in respect of last-mile connections (acquisition of the specified requirements); and b) **Deployment** in respect of last-mile connections (installation and implementation of the last-mile in target environments)	The national Department of Education is responsible for defining output specifications (that is the functionality and performance required) and setting up frameworks for effective contract management.	*Outsourcing – private party* Responsibility for Build and Deploy should be incorporated into a single agreement. Within this context, bidders should be encouraged to use subcontractors to improve their geographical deployment footprint. Multiple outsourcing contracts are recommended to allow bidders the opportunity to propose a range of technologies and to propose in respect of one, some, or all provinces or regions that cover parts of multiple provinces. Owing to the evolving nature of technology and its cost, medium term (3- 7 years) contracts are recommended. Procurement requirements should also encourage the building of capacity in rural and urban areas of South Africa.	Last miles will be facilitated by a limited range of technologies provided by relatively few source suppliers. The national Department of Education should aim to advise and/or build skills of provincial Departments of Education to choose amongst technologies and to be involved in managing contracts at a national level with suppliers. The manner in which contracts are awarded will be determined only when evaluating proposals against the Department's requirements. These may be	Product variations should be encouraged to the extent that this does not create problems in diversity management. Variations must comply with standards set down by the national Department of Education. Provincial Departments should play the primary role in planning and timing of acquisition and deployment, within the context of a

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
		Contracts should require the private party to offer the DoE advantages of newer technology as it becomes available. Procurement disciplines associated with PPPs that are relevant to the proposed procurement regime should be incorporated into agreements. It will be difficult to guarantee fixed levels of last-mile take-up to any supplier owing to the nature of the required service and the use of multiple suppliers. Accordingly, contract terms should avoid specific commitments and guarantees, and are more likely to be 'catalogue' contracts that provide pre-agreed conditions and pricing (with, perhaps, volume price breaks).	any of national, regional, provincial, or local contracts. Notwithstanding this variety, a governance structure incorporating national Department of Education oversight and provincial management is recommended. This will enable sharing of lessons learned in contract management, and will support continuing development of last-mile procurement policy. A policy framework developed by the DoE should set out principles governing procurement agreements.	single plan coordinated by the national Department of Education. The provincial Departments of Education role can be supported by the e-Unit. The e-Unit and or SITA should be considered in a procurement agency role for the Department.
14) **Operate** in respect of last-mile connections (daily availability of last-mile connections)	The national Department of Education is responsible for ensuring the WAN last-miles' operational services are effectively supplied, by setting out service requirements and ensuring there is a suitable service monitoring regime.	*Outsourcing – private party* This service should be integrated into the Build and Deploy service arrangements	The views stated in respect of Build and Deploy apply equally here.	The e-Unit's roles would include monitoring performance and operational service levels.

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
15) **User Support** in respect of last-mile connections (services that provide advice, guidance, and other relevant services to users of the last-mile connection) As with the WAN Backbone, this service is not a day-to-day requirement in respect of schools. Advisory and guidance services regarding the last-miles will primarily relate to exploitation, planning, and performance management issues, and will most commonly be delivered at national and provincial levels. Because of the detailed nature of this type of support, it is expected to be provided directly through consultative support rather than a contact centre structure.	The national Department of Education is responsible for defining and creating a framework that will allow for clear channels of communication regarding user support at national and provincial levels and managing its consequences (also see Enhance).	*Outsourcing – private party* This service should be integrated into the Build and Deploy service arrangements.	The views stated in respect of Build and Deploy apply equally here.	Provinces will need to be capacitated to effectively participate in matters relating to the last-miles. We recommend that the e-Unit should coordinate support interactions with suppliers.
16) **Maintain** in respect of last-mile connections (services required to keep the deployed last-mile connections operating in	The national Department of Education is responsible for defining output	*Outsourcing – private party* An integrated nationwide approach to procuring maintenance is recommended in order to capitalize on economies of skill and scale.	Maintenance services may be acquired for original manufactures or suppliers or may be acquired from third parties. This will be	Provinces and districts will need to be capacitated to perform a key role in monitoring

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
accordance with its specifications).	specifications (i.e. the service levels required, including, for example, time to respond, time to repair, and down time) and setting up frameworks for effective contract management.	The maintenance architecture is likely to be layered: a national capability exists for most complex problems, regional support attends to matters that cannot be resolved by front-line staff, and local on-the-ground capacity attends to routing incidents. Their operation will be coordinated via the contact centres outsource arrangement referred to above. Multiple outsourcing contracts are expected, and these should, where practical, include links to the original equipment manufacturer or supplier (i.e. the supplier(s) selected as part of (3) above). Contracts at national, regional, and local levels should be linked in order to assure continuity of service and service quality. Flexibility to allow bidders to propose for parts or all of each type of contract must be balanced against the complexities presented in managing service quality and suppliers. Owing to the critical nature of this type of service, medium term (3- 7 years) contracts with well-constructed termination provisions are recommended. Procurement requirements should encourage the building of capacity in rural and urban areas of South Africa.	determined by which proposal(s) most effectively meets all of the Department's needs. Where original manufacturers or suppliers are selected, mirroring the approach to centralization and decentralization proposed in (13) above is recommended. Where alternative suppliers are selected, certain items of maintenance can sensibly be procured through national framework contracts. Such contracts should not exclude regional supply channels, and should contain provincial Departments of Education management mechanisms to allow provinces and district offices to effect procurement of services. Contract management should be coordinated nationally, but should incorporate a strong provincial element. Local knowledge should be procured and managed provincially in accordance	quality and effectiveness of support services. The e-Unit should monitor, and manage variance in, supplier performance.

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
		Procurement disciplines associated with PPPs that are relevant to the proposed procurement regime should be incorporated into agreements.	with a national framework of contract management standard.	
17) **Enhancements** in respect of last-mile connections (addressing emerging requirements that result in amendment of then-current specifications)	The national Department of Education is responsible for defining the requirements in terms of an enhancement regime and setting up frameworks for effective contract management.	*Outsourcing – private party* The party responsible for provision of last-mile connection should also be responsible for relevant enhancements. Accordingly, this should be incorporated in arrangements set out under (13) above.	See (13) above.	The governance mechanism covering the national Department of Education and provincial Departments are recommended to provide enhancement management. This will be focused on obtaining best educational value from available funds.
18) **Refresh** in respect of last-mile connections (replacement of existing last-mile connections when they reach the end of their economic life)	Not applicable (see proposed procurement strategy).	*Outsourcing – private party* The Department will state its output requirements. It will be the responsibility of the party responsible for provision of the last-mile to ensure technology refresh such that output requirements are delivered. Accordingly, refresh obligations should be incorporated in arrangements set out under (13) above.	Not applicable.	The e-Unit should have a role in monitoring suppliers' approach to refresh: a sub-optimal refresh policy may lead to poor last-mile performance.
19) **Quality management** in respect of last-mile connections (activities that aim to maintain and	The national Department of Education is responsible for	*Outsourcing – supplier and e-Unit* The parties responsible for supply of services set out above can reasonably be expected to have, and to comply with,	This contract should be awarded and managed nationally.	Provinces and districts' role in monitoring the quality and

Requirement[25]	Policies and Norms	Proposed Procurement Strategy	Centralize / Decentralize	Linked Recommendation
improve quality)	confirming that supplier quality policies are acceptable and for establishing mechanism to audit compliance.	quality management policies. Consequently, a significant part of quality management services are recommended to be outsourced with the relevant outsourced arrangement. In addition, however, there is a requirement for quality of suppliers' quality management to be audited. This activity may be *Insourced*, but it is recommended that this be *Outsourced* through incorporation into the duties of the e-Unit.		effectiveness of services will need to be coordinated with the activities of the e-Unit.
20) **Transfer** in respect of last-mile connections (transfer of ownership of last-mile connections to the Institution) We do not recommend that the Department aim to 'own' last-miles for the same reason as stated under WAN Backbone above.	Not applicable.	Not required.	Not applicable.	

4 Professional Development

4.1 Introduction

Procurement considerations for professional development need to be viewed from several perspectives:

1) Agency: Who is procuring? Who is the buyer or who is able to buy professional development services?
2) Offerings: What is procured? What is available and offered as professional development services? Is there any regulation or restriction in this regard?
3) Pricing: What is the price for these professional development services?
4) Financing: How is this paid for? Who pays or subsidizes and with what terms?

Each is explained below.

4.2 Agency

The first dimension of a procurement model for professional development is consideration for who has the buying power. Agency is essentially about where the decision-making power lies to procure professional development opportunities. Agency for procurement of professional development services may vest with:

- The national Department of Education;
- Provincial Departments of Education;
- Regional, district, or circuit level officials;
- Individual schools or Colleges; or
- Individual educators.

These overlap somewhat with the categories of Professional Development (PD) points used by the South African Council for Educators (SACE), which is responsible for implementation, management and quality assurance of the Continuing Professional Teacher Development (CPTD) system:

- Employer-led programmes;
- School-led programmes;
- Qualification programmes
- Self-chosen activities; and
- Other programmes offered by NGOs, teacher unions, community- and faith-based organizations, or other approved providers.

The CPTD categories include consideration for agency (who is leading: employer-led, school-led, or self chosen) and implementing agent (who is offering: Higher Education Institution, NGO, or other organization). However consideration with regard to this dimension of procurement is not about the implementing agent, but about who initiates implementation. It focuses on who is empowered to procure professional development. As such, the focus is on employer led, school-led, and self-chosen activities in terms of the CPTD categories.

Different options can be considered in this regard, as the following examples illustrate:

4.2.1 Option One: Top Down Agency (Employer led PD)

In this example, procurement takes place at the highest level of the education hierarchy. The national or provincial Department of Education procures professional development services and rolls this out to its schools or FET Colleges.

It is conceivable that the national (or provincial) DoE could decide on a set of professional development offerings that all or specific segments of its educational staff require. It could outline terms of reference for such training, and issue a public tender to which professional development agencies can then respond. The DoE would review the tenders and appoint an agent (or agents) to 'roll out' the training as specified in the terms of reference. This could be considered a classical top-down model. The DoE conceptualizes, appoints, and oversees design and roll out of the professional development offering. The DoE may opt to allow some decision-making to take place lower down the hierarchy in relation to which educators attend (schools or Colleges may be asked to nominate, say, two to four educators to attend, but attendance from the school/College is mandatory).

There are several advantages to this model. The DoE retains control over course/programme design and implementation, as well as over reach and timing of offering. The DoE can invest in one national or provincial programme, so investments in course and materials design carry minimal risk and benefit from economies of scale. There is also a level of equity in this model, as all participating educators receive the same offering. However, this concept of 'equity' should be viewed with caution, as a 'one-size-fits-all' approach may not necessarily be appropriate, and this scale of intervention generally requires a 'cascade model' of implementation, where there is frequently significant variation in quality of the offering depending on the skills and experience of the facilitator. Using this model, the whole system can be considered, and critical points of intervention planned. As such, the system is big enough to justify very specialized offerings – which draw on specific job functions within the school and College environments. For example, this approach may specifically target:

- CAT and/or IT teachers;
- ICT coordinators;
- School principals;
- College principals or CEOs;
- Grade 8 and 9 Mathematics teachers; and
- Other niche groups.

In addition, the procurement process in this model is centralized, as large budget allocations can be sure to follow the procedures required by the Public Financial Management Act, 1999.

The disadvantages of this model are mainly focused on the disempowerment of educators. Applying this model removes the option of educator choice in selecting a service provider. Educators (and their school or Colleges) may be expected to participate (it is compulsory), and not be personally motivated or engaged in the offering. The offering can seldom take into account the unique contexts and settings of specific schools, Colleges, or educator needs. This weakness can be overcome if offerings are disaggregated and specialized. For example,

a course targeting mathematics teachers or application of ICT in farm schools could be sufficiently focused to create contextual relevance.

This type of approach is commonly used to communicate new policy directions, such as new curriculum requirements, where the whole system needs to be exposed to a specific set of content and approaches, and this has to be done systematically across the system. Such interventions usually have little follow-up support, with most of the investment being made in initial design and roll out.

4.2.2 Option Two: Middle Down Agency (Decentralized employer led PD)

In this option, decision-making with regard to what professional development is purchased vests with support structures at regional, district, or circuit level. In the case of schools, the provincial DoE may have allocated funding to the region, district, and/or circuit to undertake training. The circuit or district either offers the training or procures the services of a professional development agency to run the training for their schools. In the case of FET Colleges, this decentralization may take place from national to provincial level: the national Department may allocate funding for FET College training to provincial departments and the training for the FET College be procured on a province-by-province basis.

In this case, the region, district, or circuit can plan an intervention that meets specific school needs within that area. For Colleges, provincial variation can be accommodated. There can be some adaptation of an offering to suit needs within a province, region, or district. This model also provides opportunities for colleagues from schools within a district or region or colleagues from Colleges within a province to interact with each other. Applying this model, professional development service providers know the geographical location concerned, and can plan contact sessions accordingly.

Disadvantages of this model include that specialized areas (such as special needs schools, farm schools, or a specific curriculum area) may not have a sufficient critical mass to warrant dedicated professional development offerings at this level. The school or College and individual educators are not involved in selecting what professional development is undertaken. They may select which staff from the school or College participate, but, as they are not involved in requesting professional development or in the procurement process, their involvement is minimal. In addition, as procurement processes are decentralized, district, region, or circuit level staff may require capacity support on the required procurement process. They may, for example, be presented with professional development contract templates, recommended rates, and/or options of service providers through the support of the national or provincial DoE.

4.2.3 Option Three: Bottom-up School or College Level Agency (School-led PD)

In this option, the school or College has decision-making power and funding to purchase professional development offerings. The school or College may develop a professional development plan (such as a workplace skills plan) and use its funds (derived from the

province, its own fund raising, school fees, or work place skills grants) to pay for professional development.

Advantages of this model include that the school or College is responsible for its professional development and takes ownership of this process. It is expected to identify its own needs and has the choice of service provider. As a result, training is selected to suit the unique requirements of the specific school or College and its related staff aspirations. Competition between professional development agencies to offer suitable services is encouraged, and smaller programme offerings can compete with large national or province-wide providers. In some instances, where the school or College identifies a need for several educators to engage in the same offering, the training may be conducted at one site – at the school or College.

Disadvantages of this model include that professional development agencies might only service schools and Colleges in economically viable locations, and could need to be incentivized to service rural and specialist schools or Colleges. In addition, some schools or Colleges may not be a position to identify their professional development requirements or to select suitable agencies to provide these services. Thus, they may require support in developing professional development plans, accessing information about professional offerings and service providers, and ensuring appropriate procurement processes. It may however be argued that this support is necessary professional development itself – and should be part of an offering to school or College leaders.

4.2.4 Option Four: Individual Agency (Self chosen PD)

In this option, individual educators procure professional development opportunities for themselves. An individual educator (administrator, teacher, lecturer, principal, or other person) could choose to pay for their own professional development. Funding sources could be in the form of personal contributions, student loans, grants, or bursaries. There could be various incentive schemes in place to encourage individual agency to pursue professional development. These could be facilitated through various education support structures (district, provincial, and national) and include such mechanisms as:

- Salaries being based on professional qualification levels;
- Promotion decisions taking into account professional development undertakings;
- Requiring ongoing professional development to maintain professional status (CPTD system);
- Requiring set levels of professional qualification and CPTD points for appointment into professional positions (SACE requirements for registering as an educator);
- Offering bursaries, scholarships, loans, or vouchers for professional development;
- Allowing time off work duties for studies; and
- Reward and recognition processes such as teaching or lecturing awards, opportunities for teaching exchanges, and local and international travel.

Advantages of this individual agency model include that the educator is personally vested in the decision to undertake professional development, and so is more likely to engage with and benefit from it. Also, a wider range of professional development options is encouraged, designed to suit the working lives and lifestyles of education professions. This encourages competition between professional development agencies to offer suitable services to

individual educators. Likewise, specialist interests and specializations can be serviced, and a critical mass of participating educators sourced from around the country.

Disadvantages of this individual agency model occur when considering planning implications for the whole system. National, provincial, district, and circuit support structures have reduced control over what is offered and undertaken. Their role shifts to one of encouraging uptake, sharing information, and monitoring. Educators who volunteer to improve themselves may be likely to be already performing well, with the result that incentive strategies may be needed to target educators with no personal desire for continued professional development (such as ensuring that CPTD points are used as a basis for maintaining professional status, promotion, appointment, and so on). As providers have no guarantee of participation numbers, they have to carry some risk and as a result per participant fees could be more expensive than in other models.

4.3 Regulating Offerings: What can be Procured?

The second consideration pertaining to procurement models is 'what is offered?', or 'what qualifies as a professional development offering?' The format of professional development offerings is covered in the various models of professional development (face-to-face, site of learning, mode of delivery, accreditation, fee structure, and so on), so is not repeated here. The issue of concern in terms of procurement is how the professional development market is regulated, if at all. What options are presented to the procurement agents and are there any restrictions to these? Again several models are possible.

4.3.1 Option One: Open Market

In this model, all opportunities for professional development are considered professional development. The system regulates itself, as people participating in the opportunities choose which to partake in for their personal benefit (and with the ultimate objective of personal growth and advancement). The advantages of this model are that it encourages competition between providers and so can bring down prices as cost becomes a key differentiator. Providers are not subjected to any bureaucratic review or accreditation process. The main disadvantage of this model is that the State has no control over what is offered and considered suitable training. Also, the State cannot ensure that sectors of the market that are considered less economically viable – such as rural areas or specialist fields – are accommodated. The State is unable to protect educators from low quality training offered by unscrupulous providers.

4.3.2 Option Two: Approved Providers

In this model, providers of professional development offerings are granted approval (in some instances, accreditation) by some regulatory authority – in the South African context, SACE or the Education Training and Development Practitioners Sector Education and Training Authority (ETDP Seta) – to offer professional development opportunities. Funding mechanisms favour participating in offerings provided by these approved providers. This is generally the model adopted in the Higher Education sector, where identified public and

private Higher Education Institutions are granted departmental approval. The State does not review individual programme offerings, but the institution as a whole.

The advantage of this model is that there is a level of State approval which can be used to guide educators, schools, and Colleges in their choice of suitable professional development agencies. By having a single and transparent approval process for institutions, institutions are then free to design and adapt their programmes as required. Focusing on approving providers reduces the review cycles and the bureaucratic approval process. Approved providers are then granted 'academic freedom' to adapt their course, innovate and adjust to market requirements without having to gain State approval in their individual programme offerings.

The disadvantage of this model is that approval processes require systems and capacity to administer them, which adds costs to the State. The approval process also takes time, so new providers cannot be quickly approved to suit an urgent market or State requirement. This tends to disadvantage less well established and smaller providers that are unable to compete with the established approved providers such as universities. Obviously in exceptional circumstances, the approval could be streamlined. The criteria and process for approval need to be made transparent and accepted as appropriate to ensure stakeholder commitment to the process.

4.3.3 Option Three: Approved PD Offerings

Specific offerings such as a conference, discussion forum, or community of practice can be approved as a professional development offering. In this case, the unit of review for approval is the course offering or PD event – and not the provider. This review may be done independently from, or in conjunction with, the approval of professional development providers. In the South African context, such offerings are likely to require SACE approval to contribute to the CPTD system.

The advantage of this model is that every offering meets the requirements of the stated criteria for appropriate and high quality professional development offerings. Criteria can be established for various categories and made transparent to providers. They can then use these as a basis for self-improvement and a means to ensure that they maintain the acceptable standard of their offerings.

A key disadvantage of this approach, as for the approval of providers, is that approval processes require systems and capacity to administer them, which adds costs to the State. The approval process also takes time and so new programmes of events of PD offerings cannot be quickly approved to suit an urgent market or State requirement. In addition, this adds bureaucratic workload to the providers which can slow down implementation, reduce innovation, and add to administrative costs. Where new approaches require State or bureaucratic approval, they may be less likely to be attempted, and approved courses may become dated to avoid having to re-register programmes. This can be minimized by allocating an approval life span to a programme of, say, three to four years. Another disadvantage is that this model duplicates to some extent the work of SAQA and the ETDP Seta in registering courses and programmes and approving training providers.

4.3.4 Option Four: Standards-Based Requirements

In this model, only accredited offerings are recognized as professional development offerings. Training provided needs to be accredited to issue a qualification, short course, or unit standard. In the South African context, this would be done against the National Qualification Framework, using quality assurance agencies approved by the ETDP Seta, such as the Council on Higher Education or individual ETDP training providers.

The advantage of this model is that each offering has gone through a level of curriculum review and leads to accumulation of credits on the Nationals Qualification Framework. The bureaucracy for this system already exists, and schools and FET Colleges can benefit from ETDP Seta grants and skills levy disbursements.

A key disadvantage of this model is that the relevant standards-generating bodies to support professional development on ICT in education have not been developed. Standards generation processes are slow and costly, involving a wide range of stakeholders: the Department of Education, professional development providers, and industry players in the ICT sector. This is compounded by ICT in education sitting across the education and IT sector and alignment between the two frameworks being required. In the absence of SAQA-registered unit standards and whole qualifications, this model can only support courses and programmes already registered on the NQF, such as Advanced Certificate in Education (ACE) programmes. In addition, many professional development events and offerings – such as participation in a community of practice, self paced review, use of digital content and lesson plans or participation in conferences and trade fairs – cannot be registered as a unit standard or short course and would not qualify for inclusion on the NQF.

4.4 Pricing and Costing Models

Another consideration for the procurement models is pricing:
- What is the overall cost?
- What is charged (price)?
- Which products and services are provided?

Pricing for professional development is usually calculated on the basis of the number of participants, using a student or participant fee structure. The agent responsible for procurement is charged a student or learner fee for the agreed offering. This may constitute tuition fees for a course, registration fees for a conference, the fee to purchase a self-study guide, or the price of a learner subscription to a journal or community-of-practice forum.

To allow for comparison of pricing levels one may use:
- Cost per participant per notional hour; or
- Cost per participant per CPTD point.

The overall cost is the fee paid by the agent (as defined above) procuring the professional development services.

The cost is not necessarily the same as the charge levied to the end user or participant. This is often referred to as the price, charge to the end user, or student fee. The price to the

participant may be zero (if it is a free service), but there is generally always a cost associated with offering the product or service, which is then borne by other possible agents.

4.5 Financing: How is this Paid For?

Financing of professional development refers to how payment is made and by which agents. There are several models in this regard, many of which can operate in concert (for example model one may be applied to cover 80% of the cost, while the remaining 20% is funded using model three).

4.5.1 Option One: Direct Procurement

In this option, the procurement agent finances the professional development offering, making a direct payment, most likely in instalments, against agreed milestones, to the professional development agency (agencies). Alternately, the agent (such as a national or provincial department) may decentralize financing and provide this to be administered at a lower level (such as regional, district, or school level).

The main advantage of this model is that there is a single transaction, which reduces risk and administration. Advantages of economies of scale can be taken into account, as the provider's risk is reduced and so the pricing may be lower. The disadvantage is that responsibility for transaction is removed from the main beneficiaries: either the School or College or the individual educator. As such, they could become less invested in the transaction and less likely to value the offering. In this model, responsibility to ensure appropriate levels of participation vests with the procurement agent, as the provider has been guaranteed a payment irrespective of participation levels.

4.5.2 Option Two: Subsidies

Here, the procurement agent subsidizes professional development offerings, usually on a 'per-participant' basis. The subsidy is given directly from the government agent to the professional development provider, and does not involve the participant at all. This type of model is adopted in higher education environments, where higher education institutions are able to claim for government subsidies on the basis of learner enrolments.

In this model the onus to ensure appropriate levels of participation vests with the provider. They are paid per participant and so are incentivized to ensure appropriate uptake levels. A disadvantage is that they have to carry some of the risk of potentially low uptake levels, which will increases their per-participant pricing. Also this models adds to the administrative load, as monitoring and reporting on participation are required as part of the transaction approval process.

4.5.3 Option Three: Bursaries

In this instance, agents award bursaries to students enrolling in professional development activities. These may be awarded based on meeting sets of criteria and may be accompanied by associated work-back agreements.

The advantage of this approach is that the individual educator is able to make bursary applications and pursue their own professional development ambitions. They are vested in the process, and have to agree to the bursary terms. Adopting a bursary system as opposed to a subsidy system allows space for private sector contributions to the scheme. Individual companies (FET Colleges with their independent status, or private sector companies) may offer bursaries that suit their own requirements or support their Corporate Social Investment objectives. So bursaries allow for cost sharing with agencies other than the State.

In addition bursaries, which can have set criteria for their award, are a good mechanism for the State to engineer access to professional development offerings. For example, educators who are able to afford professional development offerings or who have been previously advantaged can be excluded from the bursary criteria. The bursary can target participants on the basis of need, academic merit, area of specialization (prior learning), or any other criteria as deemed appropriate.

The disadvantage is that bursary administration processes are required, and individual applications need to be reviewed against transparent criteria. Where work-back agreements are in place, these need to be tracked and monitored.

4.5.4 Option Four: Loans

Here, agents pay for the professional development offering, but structure a loan agreement with the participant (or possibly the school or College) with set interest rate and repayment terms.

The advantage of loans is that they recognize that appropriate professional development results in greater economic opportunities for the participant in terms of their career prospects. While the participant may not be in a position to pay for the offering at the time, once qualified they are able to contribute financing towards studies. This shares the cost of professional development with the participant.

The disadvantage of this approach is that it requires administration and monitoring. The motivation to participate in the offering needs to be sufficiently high and the subsequent economic benefit clear to ensure uptake.

4.5.5 Option Five: Vouchers or Credits

Here, agents issue vouchers or professional development credits to schools, Colleges, or educators, which are then redeemable by professional development agencies. The voucher can then be used by the provider to claim the participant subsidy.

A voucher or credit system may either be administered at an individual educator level or at the school or College level. For the individual level, each educators is allocated credits for participation in professional development offerings. For the school or College level, the credits are awarded to the school or College and they decide which educators benefit from the offerings.

The advantage of this model is that it puts the power of choice for professional development in the hands of the school or College or individual participant. This is thought to encourage competition between providers to offer the best quality service for the voucher value to the participant. In addition, the school or College level is that the school or College is empowered to direct the professional development direction and requirements of its member educators. It may not be appropriate for all educators to receive a professional development credits for e-education, but it would be likely that in a year 10% of the staff could be engaged in such training.

4.5.6 Option Six: Grants

On the basis of documentation supplied through an application process, grants could be issued to schools, Colleges, or individual educators. While bursaries tend to be associated with a formal course or qualification, a grant could apply to a far wider range of funding requirements, such as travel, staff exchange, conference participation, submission of an academic paper, and so on. The ETDP Seta offers discretionary grants, but other agents could structure various grant application processes.

Grants could be applied for in advance, and advance payment made for services and products. Alternately, a grant may be administered on a refund basis. The person, school, or College would make their grant application, get notice of approval (with conditions such as the need to demonstrate proof of participation and/or completion), and then submit to the grant fund for a refund.

The disadvantage of this model is that a grant process requires administration and approval. Clear guidelines are required, and awarding of grants needs to be made transparent to ensure that allocations are fair. Grant applications take time and administration from the side of the applicant (school, College, or individual educator). This could result in well-resourced and advantaged schools and Colleges submitting applications, while those that should be targeted may lack resources and capacity to submit applications and so be further disadvantaged.

4.6 Type of Procurement

Finally, the type of procurement transaction needs to be considered. The generic options outlined above are relevant to professional development:

- In-house school or FET College;
- In-house national Department of Education;
- In-house provincial Departments of Education;
- Outsourcing – other government departments;
- Outsourcing – Private Party;
- Public Entity;

- Public-Public Partnership;
- Public-Private Partnership; and
- Privatization.

Their characteristics have been explained above, so are not be repeated here.

4.7 Professional Development Procurement Models

Considering each of the above dimensions, various possible procurement models are available and depend on the options selected for each dimension of consideration. The following matrix provides a summary of procurement options for each dimension.

Table 16 Matrix of procurement models

1. Procurement Agency: Who is empowered to procure the professional development offering?	Agency option 1: Top Down Agency (Employer led PD)	Agency option 2: Middle Down Agency (Decentralized employer led PD)	Agency option 3: Bottom-up School or College Level Agency (School-led PD)	Agency option 4: Individual Agency (Self chosen PD)		
2. Offerings: What can be procured? How is this regulated if at all?	Offering options 1: Open Market	Offering option 2: Approved providers	Offering option 3: Approved PD offerings	Offering option 4: Standards-based requirements		
3. Pricing and costing considerations	Overall cost to procurement agent:	Cost per participant per notional hour:	Cost per participant per CPD point:	Price charged per participant:	Product and services included in offering:	
4. Financing	Financing option 1: Direct payment	Financing option 2: Subsidies	Financial option 3: Bursaries	Financial option 4: Loans	Financial option 5: Vouchers	Financial option 6: Grants

It is feasible that there could be a procurement model where:

- There is top-down agency, with the national or provincial Department of Education procuring the services of several professional development providers (agency option one);
- The offerings are approved, as they are unit standards-based short courses as registered on the NQF (offerings option four);
- The pricing and costing considerations are agreed and the price charged per participant is zero;
- Educators are given a professional development credit or voucher to participate in the training, which the professional development provider can claim from the provincial government on submission of the voucher.

Alternately, the professional development procurement model may comprise:

- An individual educator choosing to enrol in a specific professional development offering (Agency option four);
- Educators choose from a published list of approved providers (offerings option one);

- The overall cost is not relevant, and the educator is aware of the fees to be charges to them for the course before they register;
- The educator pays the fees and enrols;
- The provider claims an additional government subsidy directly from the government, based on their learner enrolment (financing option two).

Using the above matrix, multiple procurement models for professional development offerings can be developed. Consequently, specific, preferred procurement strategies are indicated to implement the recommendations for professional development.

4.8 Recommended Professional Development Procurement Model

As has been explained in the Options Analysis, an existing mechanism exists for educators in respect of professional development, both in terms of pre-service education programmes and in-service education programmes. The recommendations in respect of professional development relate to enhancement of the existing mechanisms in order to achieve the requirements of the e-Education Initiative.

The ETDP Seta plays a role in directing professional development funding for scarce and critical skill areas in the sector and providing quality assurance for training providers. The ETDP Seta will play a role in monitoring provision and skills development in the sector through its annual skills planning process, which involves the national and provincial Departments of Education, schools, and FET Colleges. Development of e-learning skills and capacity as priority areas in all of these work environments is to be included in the ETDP Seta framework of operation. In so doing, specific grants and subsidies for e-learning related professional development opportunities will be facilitated through the existing mechanisms of collaboration between the Departments of Education and the ETDP Seta.

SACE has a legislative responsibility to provide a CPTD system. Although the SACE Act does not provide SACE with an exclusive right, it is not desirable for the Institution to have its own parallel system, given that SACE was established for exactly this purpose. The Institution's recently issued ICT professional development guidelines also support SACE. Furthermore, a wide selection of professional development opportunities will be made available in terms of the e-Education Initiative, which will allow each educator to follow the development route most suited to his or her individual needs and requirements.

Given the above, a PPP is not considered suitable for professional development, as this may also not achieve equity of delivery nor provide for the diversity required, both in types of training offered and methodologies applied.

The existing mechanisms do, however, have key deficiencies:
- The SACE CPTD system is not yet functional;
- The envisaged CPTD system focuses only on educators and not on non-educational personnel;
- SACE does not have sufficient capacity to manage the CPTD system, especially if the additional workload that this e-Education Initiative will generate is taken into account;

- There is a lack of funding for development of standard training materials where these may be required; and
- There has been limited spending on e-Education professional development by provinces in the past.

The recommended professional development procurement model for the e-Education Initiative is, therefore, that schools and Colleges become the primary agents for procuring professional development services. However, the district office will play an important part in facilitating and coordinating procurement of professional development services relevant to the whole district. Through their ICT Development Planning Processes, schools and Colleges should:

- Receive information on priority training interventions as identified by provincial Departments of Education (including which interventions have mandatory participation);
- Access information on what is available nationally;
- Participate in district-wide planning processes for professional development across schools in the district;
- Engage staff regarding their individual professional development requirements; and
- Put forward an annual professional development plan for the school or College.

While individuals would not be precluded from procuring their own professional development services, access to funding and subsidies for professional development should occur through school and College ICT Development Plans, which are facilitated by the district office.

Departments of Education (national and provincial) will play a key role in ensuring that all schools and Colleges have the capacity and funding to pursue ongoing e-Education professional development. In the short term, the national Department will procure professional development services for an initial orientation for district offices and then for all schools and Colleges on the e-Education Initiative and the ICT development planning process. There will also be central procurement of a detailed structured learning programme for targeted schools and Colleges to ensure that their managers are capacitated to develop ICT Development Plans and manage their related professional development plans as required by their province. Both the orientation and detailed structured learning programmes will be procured through traditional processes, in that the department of Education will prepare and issue an open tender. The orientation and structured learning programme(s) will be approved by SACE as contributing to CPD points. Provincial Departments of Education will identify which schools and Colleges should be selected for targeted support where needed.

Provinces will be able to prioritize key professional development interventions, ensuring that these are integrated into the ICT Development Plans of relevant schools and Colleges and appropriately subsidized and/or funded. Where necessary, a province may adopt a traditional procurement process of developing and issuing an open tender to conduct specific professional development interventions. Any provincial initiative should, however, include a process of ensuring SACE approval for attainment of CPD points and should have the potential to be offered in other provinces. The intention, however, is to ensure that districts, and in turn individual schools and Colleges within their jurisdiction, have some discretionary or general professional development budget (or credits) available to them for their staff to undertake professional development that may not be a provincial priority. It is envisaged that schools and Colleges will be able to select from the national list of professional development

offerings which contribute to CPD points (additional details on the preferred procurement strategy for this are presented below). These selections will be communicated to the district, which will then coordinate offerings across schools. Individual provinces will be able to indicate which of these national offerings are provincial priorities. As such, schools and Colleges will be able to select from a list of nationally (SACE) approved and provincial priority professional development offerings.

The national Department of Education will play a role in providing policy guidelines, sharing information on available offerings, and administering incentive mechanisms to encourage appropriate uptake of professional development support. The incentive mechanisms to be used will include:

- A once-off Higher Education Institution (HEI) subsidy to support universities in offering appropriate ICT-related initial educator training.
- A CPTD points system where educators are required to accumulate points in order to retain their professional status. These CPTD points will include ICT-related PD offerings. This will be administered, as Gazetted, via SACE.
- A CPTD points system where non-educator staff members are required to accumulate CPTD points for ICT related PD offerings. This will be administered alongside the SACE CPTD system.
- An e-education Professional Development credit or voucher system which works in support of the CPTD system as a mechanism to fund or subsidise PD undertakings.

The table below outlines a detailed set of output specifications to implement the recommendations made in our Options Analysis. Output specifications are presented that describe the products and/or services that need to be procured in order to implement the recommendation. For each output specification, an associated proposed procurement strategy is outlined below, which takes into account the range of available procurement options presented for professional development.

Table 17 Output Specifications for Professional Development

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
1) Policy guidelines defining levels of competence for ICT use for all educators and non-educator personnel developed and approved.	*Outsourcing – private party* Procurement of expert consultancy services through open tender.	National Department of Education	Recommendation One: Define and approve levels of competence for ICT use for all educators.
2) A once-off HEI subsidy to support HEIs in their fulfilment of the requirement to ensure that all educators entering the profession are developed to at least the Adaptation Level of ICT use is established and maintained.	*Public entity – SACE* Once-off subsidy to be established as a dedicated fund, (limited to a three year period) in consultation with the national Department of Education. Services in maintaining the fund to be provided by SACE, as an extended part of their responsibility for overseeing teacher development. Additional capacity for SACE to offer this service should be procured by following existing SACE human resource and/or sub-contracting procedures. Public HEIs to apply to SACE to draw down funds from the once-off subsidy according to pre-defined proposal format.	SACE	Recommendation Two: Ensure that all educators leaving pre-service professional development programmes are developed to at least the Adaptation Level by the end of 2009/2010.
3) A CPTD system for educators and a quality assurance system for administrators and technical staff for continuing professional development relating to ICT skills is established and maintained.	*Public entity – SACE* CPTD System to be established and maintained by SACE. Additional capacity for SACE to offer this service should be procured by following existing SACE human resource and/or sub-contracting procedures. This should include the requisite capacity for administration of CPD points for non-educator personnel in schools and Colleges.	SACE administers CPTD system and e-PD credits. Provincial Departments of Education allocate funding for e-PD credits.	Recommendation Three: Establish and sustain implementation of in-service professional development through the CPTD system.

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
	The funding or subsidies for CPTD-related training should be provided via provincial Departments of Education as e-PD credits. Dedicated funds for this should be earmarked through the e-Education Initiative. Schools and Colleges to apply for registration of all personnel on CPTD activities through their ICT Development Plans.		
4) An audit of district level capacity is conducted and additional ICT leadership support staff are identified and/recruited for district offices.	*Outsourcing – private party* Procurement of expert Human Resource services.	National Department of Education	Recommendation Four: Identify and appoint and relevant district level staff and provide a the structured learning programme for district officials focusing on their leadership and coordination roles in supporting the objectives of the e-Education Initiative.
5) A structured support programme on district level ICT leadership and support is developed and implemented.	*Outsourcing – private party* Procurement of expert professional development services to develop Open Educational Resources for a district leadership programme through open tender. Procurement of expert professional development services to implement district leadership programme for each province through open tender.	National Department of Education procures development of learning materials and guides. Provincial Departments of Education procure service providers to implement programme across	Recommendation Four: Identify and appoint and relevant district level staff and provide a structured learning programme for district officials focusing on their leadership and coordination roles in supporting the objectives of the e-Education Initiative.

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
		all districts in the province.	
6) A structured support programme on design and development of ICT Development Plans, directed at school management, is developed and implemented.	*Outsourcing – private party* Preferred provider relationships to be established with 2-4 service providers to deliver this service, ensuring that service providers are able to cover full geographical scope of South Africa. Providers should be appointed through an open tender against detailed terms of reference. The terms of reference may differentiate specific requirements for each province. A national per-school price to be agreed for the services mapped out in the Options Analysis, with these services drawn on as requested on a province-by-province basis. Each provincial Department of Education to contract with one or more preferred provider to deliver support services within the province, with overall coordination provided nationally. Payment to service providers to be made nationally on the basis of claims approved by the relevant provincial Department/s of Education.	National Department of Education to identify 2-4 preferred service providers. Provincial departments of Education to select and contract with preferred service provider.	Recommendation Five: Provide a structured learning programme for school and FET College management which leads to submission and approval of ICT Development Plans.
7) A structured support programme on design and development of ICT Development Plans, directed at FET College management, is developed and	As for output 4.	National Department of Education	Recommendation Five: Provide a structured learning programme for school and FET College management which leads to submission and approval of ICT

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
implemented.			Development Plans.
8) A series of incentive mechanisms are operational to ensure vibrancy and a diversity of programme offerings including: a) Funding allocations to support programme and resource development for priority interventions; b) A CPTD system to encourage uptake of ICT-related PD offerings; and c) The related e-PD credit system to fund and/or subsidise ICT related PD offerings.	*In-house national* Priority professional development interventions to be identified by the national Department of Education on the basis of policy priority, as well as in consultation with provincial Departments, teacher unions, and SACE. *Outsourcing – private party* National Department of Education to procure expert consultancy services through open tender to undertake requisite programme and resource development. *Public entity- SACE* Services to develop and administer incentive mechanisms to be provided by SACE through the CPTD system. Additional capacity for SACE to offer these services should be procured by following existing SACE human resource and/or sub-contracting procedures. *In-house provincial* Provincial Departments of Education to allocate e-PD credits to their schools and Colleges, as part of budgeting for ICT Development Plans for schools and Colleges. *In-house provincial* Funding of e-PD credits to be provided via	National Department of Education responsible for identification of priority professional development interventions and for procurement of expert consultancy services. SACE to manage CPTD system and associated incentive mechanisms. Provincial Departments to manage financing and allocation of credits.	Recommendation Six: Invest in establishing and sustaining a vibrant diverse system of professional development for educators to support implementation of the e-Education Initiative.

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
	provincial Departments. The e-PD credit allocations may distinguish: • General e-PD credits which are redeemable for any ICT related offerings that results in CPTD points; and • Priority e-PD credits which are redeemable only for priority PD interventions as identified by the provincial and/or national Department.		
9) All relevant DoE departmental structures are aware of the opportunities created by the e-Education Initiative to support their strategic objectives and are aligning their functions to optimize these.	*Outsourcing – private party* National Department of Education to procure expert consultancy and communication services through open tender.	National Department of Education	Recommendation Eight: Invest in a series of change management interventions to support implementation of the e-Education Initiative.

NOTE: No specific outputs have been defined above for 'Recommendation Seven: Develop a learning space on the Thutong portal which delivers on professional development services and information directed at school and FET College communities', as the services to implement this recommendation form part of the Curriculum and Content Output specifications. They will, therefore be procured through the Thutong portal procurement process.

5 Curriculum and Content

5.1 Introduction

Procurement considerations for curriculum and content need to be viewed from several perspectives:

1) Agency: Who is procuring? Who is the buyer or who is able to buy curriculum and content products and services?
2) Offerings: What is procured? What is available and offered as curriculum and content products and services? Is there any regulation or restriction in this regard?
3) Pricing: What is the price for these content products and services and what are the pricing models?
4) Financing: How is this paid for? Who pays or subsidizes and with what terms?

Each is explained below.

5.2 Agency

The first dimension of a procurement model for curriculum and content is consideration for who has the buying power. Agency is essentially about where the decision-making power lies to procure curriculum and content products and services.

The agency for procurement of the school curriculum rests wholly with the Department of Education. The national Department of Education is mandated to publish the national curriculum and its related guidelines. The curriculum units in provincial Departments of Education then support their district office subject advisors and support staff in their provinces in implementation of the national curriculum statements.

For the FET College sector, the agency for curriculum procurement lies jointly with the national Department of Education, which has published the National Certificate (vocational), and SAQA and the various Setas and their FET-band courses and programmes such as learnerships. Responsibility for developing and publishing curricula vests with national State structures.

In terms of ICT applications and educational resources, these may be procured by a range of players:

- The national Department of Education;
- Provincial Departments of Education;
- Regional, district, or circuit level officials;
- Individual schools or Colleges; or
- Individual educators.

Different options can be considered in this regard, as the following examples illustrate.

5.2.1 Option One: Top-Down Agency (National Department of Education)

In this example, procurement takes place at the highest level of the education hierarchy. This is the case for curriculum development, where the national Department of Education and SAQA are responsible for curriculum development. This is the legislated option and appropriate to ensure national coherence within and portability across the National Qualifications Framework.

In relation to content procurement, this top-down agency model may be applied where the national Department of Education procures relevant ICT applications (through a licensing agreement or by commissioning development and distribution of a specific platform or package). The advantages of this model are that there is national standardization, which ensures interoperability between users, while economies of scale can be used to negotiate better pricing and licensing agreements. In addition, because the procurement process in this model is centralized, large budget allocations can be sure to follow the procedures required by the Public Financial Management Act, 1999. The economies of scale in operating at a national level, provided the requirements of an application across the entire system are uniform, offer a compelling argument for adopting a national procurement or development approach.

This needs to be weighed up against the requirement to encourage a competitive software and educational materials market, where there is room for multiple and competing tenders for the supply and development of ICT applications and educational materials for school and College markets. A key disadvantage is that schools and individual educators are not provided with any choice. While educator choice may not be essential for some ICT applications, it could be an important consideration in selection and use of educational content.

5.2.2 Option Two: Middle-Down Agency (Provincial or District Level)

In this option, decision-making with regard to content purchases vests with support structures at provincial, regional, district, or circuit level. The provincial DoE may have allocated funding for province-wide software licensing agreements or for development of a specific content application.

In this option, the province can plan for an intervention that meets specific school or College needs within that area. There can be some adaptation of an offering to suit needs within the province, region, or district. This model also provides opportunities for colleagues from schools within a district or region or colleagues from Colleges within a province to share their experiences in using the same platforms and to be able to share lessons in having used particular content offerings.

The main disadvantage of this model is that there are smaller volumes of content licences and sales at the provincial level than at the national level, which may increase the unit price for licences or purchases. There is also the potential that, where provinces are using different systems or content sources, they are unable to share resources and experiences. This model may result in duplication of effort, as each province has to have capacity to review, recommend, and procure content. In this model, the school or College and individual

educators are not involved in selecting the educational content used in their school or College.

5.2.3 Option Three: Bottom-up School or College Level Agency

In this option, the school or College has decision-making power and funding to purchase ICT applications and educational content. This may either be done in a completely free market, where schools and Colleges can select from any available resources, or it may be done with a national or provincial framework where only approved applications and content resources may be purchased. The latter is currently the model used by schools to procure physical Learning and Teaching Support Materials (LTSM). Each province approves a list of LTSM, from which schools may select. Procurement of LTSM is then done either directly with publishers or via the provincial department LTSM order system, depending on the status of the school.

This model is appropriate for educational content where educators have individual preferences regarding which materials they would like to use and can communicate this via their school or College procurement planning processes. The advantage is that educators take responsibility for familiarizing themselves with different options and, having made selections themselves, are then vested in using that resource. At the same time, there is diversity in the LTSM market. Different needs can be catered for because several competing publishers or materials developers can meet the criteria and so be approved. There is a healthy, competitive market, yet schools and Colleges are protected from having to distinguish unsuitable and poor quality materials from those that meet departmental requirements.

The disadvantage of this model is that it is not suitable to both educational content resources and ICT applications. Certain ICT applications, such as management information systems, lend themselves to national standardization to ensure data consistency across the sector. In such situations, it may be inappropriate to allow schools or Colleges to select their own systems (even if from a predefined list).

5.2.4 Option Four: Individual Agency

In this option, individual educators or learners procure ICT applications and educational content. An educator (administrator, teacher, lecturer, principal, or other person) could choose to pay for their own LTSM. Although unlikely to be systemically applied, it is conceivable that educators may want a collection of LTSM to support their specialization. As such, they should be able (and encouraged) to make LTSM purchases for their own professional development.

Similarly, individual learners, or their parents, may opt to purchase relevant LTSM. The most obvious disadvantage of a model where each learner chooses their LTSM is that there can be no whole-class teaching from an agreed learning support material. Another is that learners who are unable to afford LTSM purchases are disadvantaged. The disadvantages demonstrate that this model is not a viable content procurement model for the whole system. However, this is not to imply that it should be entirely disregarded, nor can it be ignored. Learners who are able to afford such purchases are advantaged. They are able to make purchases via retail

stores, directly from publishers, and via online shopping. It may, therefore, be argued that, because many learners (poor and affluent) are making such purchases and are subjected to the marketing of various publishers and content vendors, the State can play an important role in ensuring that all learners and their parents can access information about suitability of LTSM to support the national curriculum. So, like the school or College level agency model, this individual agency model may either be regulated or unregulated. The Department of Education can leave the marketing of materials solely to vendors or can play a role in reviewing materials and providing Departmental approval to suitable materials in order to guide individual consumers.

5.3 Regulating Offerings: What Can be Procured?

The second consideration pertaining to procurement models is 'what is offered?' This issue or regulation has already been touched on in the descriptions of the various agency models above, as it is fundamental to the curriculum and content arena.

In terms of curriculum, it clear that there is a need for regulation and that one national curriculum ensures that there are comparable standards and portability between institutions, while avoiding duplication of effort in designing curriculum frameworks, assessment tools, and so on. While a provincial competence for curriculum development is conceivable (and has been applied in South Africa before for certain Departments of Education), the current policy framework provides for national regulation of both school and FET College curricula.

In relation to regulation of content, there is, however, far greater flexibility, and various models are worth considering. Each is presented in brief below.

5.3.1 Option One: Open Market

In this model, there is no regulation. Content developers are free to develop any ICT applications and LTSM, and there is no process for Department of Education approval. An advantage of this model is that it encourages competition between providers, and so can reduce prices as cost may be a key differentiator between competing LTSM products. Content developers, software vendors, or publishers are not subjected to any bureaucratic review or accreditation process. However, by allowing an open market, procurement agents may buy materials or software that are not of a suitable quality and do not meet the requirements of the national curriculum. The Department has no control over what is offered and considered suitable content.

Also, in an open market, typically only materials considered profitable are developed, while content that is important but not necessarily economically viable may be neglected. An example of this might be content that supports learners with barriers to learning, where developers do not consider this a large enough market to service. Another example may be materials in minority indigenous languages. Left to the open market, these would be unlikely to be developed, even though their educational and social importance is clear.

5.3.2 Option Two: Approved Developers or Publishers

In this model, content developers or publishers are granted national Department of Education approval. The Department does not review individual content offerings, ICT applications, or LTSM programme offerings, but the development agency as a whole. On the basis of its track record of quality materials and software production (coupled with fear of losing State approval or preferred supplier status), the development agency is able to develop and market new products without having each individually approved.

The advantage of this model is that there is a level of State approval that can be used to guide educators, schools, and Colleges in their choice of suitable developers or publishers. Preferred supplier status gives developers and publishers the freedom to react quickly to new requirements without requiring approval on every product. The administrative burden placed on the State to review and approve content is thus substantially reduced.

The disadvantage of this model is that a few preferred suppliers may dominate the market. Small or new development companies may be unable to compete or to meet the criteria for State approval for the company as a whole. They may, however, have excellent quality individual products on offer, which are then lost to the market given the company's overall approval status.

A further disadvantage of this model is that approval processes require systems and capacity to administer them, which adds costs to the State. Monitoring is required to ensure that preferred suppliers maintain requisite standards of quality.

5.3.3 Option Three: Approved Content Products and Services

The Department may also opt to review and approve identified content offerings. Here, the resulting content product is reviewed, rather than the content development agency. In the South African context, this is currently the case, where each province publishes lists of approved LTSM. This, however, applies predominantly to textbooks, and there are very few digital materials on these approved lists.

The advantage of this model is that every offering meets the Department's criteria and requirements. Criteria can be established for various categories, and made transparent to providers. Developers can use the criteria for approval, as a basis for self-improvement, and as a means to ensure that they maintain an acceptable standard for their products.

A key disadvantage of this approach is that approval processes require systems and capacity to administer them, which adds cost to the process. The approval process also takes time, and so new LTSM and applications cannot be quickly approved to suit an urgent requirement. In addition, this adds bureaucratic workload to developers, which may reduce innovation and add to administration costs.

A further disadvantage of this model is that it may favour the traditional textbook view on LTSM: that there is a single authoritative resource from which learners and educators engage with the curriculum. New paradigms of the value of a variety of resources – which do not

necessarily communicate the entire curriculum and where single elements may be very suitable at particular points in time – are not as easily accommodated. Such resources are so numerous that review of individual lesson plans and small chunks of learning materials is not logistically possible.

5.3.4 Option Four: Educator-Led Regulation

In this model, individual educators are encouraged and empowered to review and comment on materials that they have used. Other educators or agents are then able to see the comments and ratings of their peers before they procure that content product or service. This is a technique used frequently in online communities, where approval ratings are published and popularity indicators (such as most frequent downloads) are used to display online content to potential consumers.

The advantage of this model is that educators are empowered to review materials and can select on the basis of their peers' views in similar contexts. The disadvantage is that data may be so general that it is not useful, while aggregated data may be unreliable. This is not a viable model in the absence of ICT communication and data processing, given the time delays and labour that would accrue in communicating feedback and analysing reviews. In the online environment, this functionality can be relatively easily and cheaply built. A disadvantage of the online educator review model is that it is difficult to ensure that educators participate in the review process, as contributions are usually voluntary. Incentive mechanisms (such as accumulation of e-LTSM credits or CPTD points for submission of reviews) may be put in place to encourage submission of reviews, but these add administrative costs. A further potential disadvantage is that review processes may be manipulated by, for example, publishers commissioning or constructing reviews to favour their materials. To avoid this, secure identification verification processes and monitoring are needed.

5.4 Pricing and Costing Models

Another consideration for the procurement models is pricing:

- What is the overall cost?
- What is charged (price)?
- Which products and services are provided?

Pricing for curriculum development tends to be negotiated on the basis of terms of reference agreed with the Department of Education. The resulting curriculum documents are policies owned by the Department, published for public access, and distributed freely to schools and Colleges. This is an appropriate model for curriculum, as these documents should be in the public domain, easily accessible to educators and learners, and available freely to interested materials development.

Pricing for content is, however, agreed in other ways. The usual LTSM model is that the risk of development is borne by the publishing or development company, and pricing is set per end user or per product. In the digital environment, this pricing may be set in the form of annual licensing agreements calculated per school or FET College, per workstation, per user,

(depending on learner, educator, or manager target), or as a provincial/national agreement or licence for public school or College use.

The Options Analysis has considered the potential cost benefits of shifting market competition away from the point of sale, so that, rather than encouraging publishers and materials developers to compete at the point of sale of completed products, this competition occurs at two separate stages:

- At the point of development of the materials; and
- At the point of production for example printing and distribution.

Instead of publishers competing to get onto approved provincial lists once they have invested their venture capital and taken the commercial risk to develop learning resources, they compete for government tenders to develop specific learning resources. There is then further competition for production of materials – for the guaranteed distribution – once materials development is complete, but this competition starts afresh, so can be secured by a different agency from that responsible for development of the resource. While such an approach would require a shift in the business models of many publishers, it would create possibilities for long-term cost savings to the system as a whole.

To allow for comparison of pricing levels for educational content, one may use the cost per participant per notional hour. This may entail modelling projected content use and taking into account computer access projections for specific classes within a school or College.

The cost of content is not necessarily the same as the charge levied to the end user or participant. This is often referred to as the price, charge to the end user, subscription, or licence. The price to the participant may be zero (if it is a free service), but there is always a cost associated with developing and offering the product or service, which is then borne by other possible agents.

5.5 Financing: How is this Paid For?

Financing of curriculum and content refers to how payment is made and by which agents. There are several models in this regard, many of which can operate in parallel. Different models may apply to different types of content.

5.5.1 Option One: Direct Procurement

In this option, the procurement agent finances the curriculum or content development and/or distribution, making a direct payment, against agreed milestones for pre-defined numbers of resources/licences, to the agency or agencies.

The main advantage of this model is that there is a single transaction, which reduces risk and administration. The advantages of economies of scale can be taken into account as the developer's or publisher's risk is reduced and so pricing may be lower. The disadvantage is that responsibility for the transaction is removed from key beneficiaries (either the School/College or individual educator). As such, they could become less invested in the transaction and less likely to value the offering. In this model, responsibility to ensure appropriate levels of use vests with the procurement agent, as the developer has been

guaranteed a payment irrespective of how content is used and marketed. It remains, however, in developers' interests to ensure that their content is well received and appropriately used. As such, several developers couple training and support services on effective use with their product sales. In this model, support, upgrade, and maintenance services may be built into the agreed sales contact.

5.5.2 Option Two: Subsidies

Here, the procurement agent subsidizes content purchases, subscriptions, or licensing agreements. The subsidy may be given directly from the government agent to the content developer or distributor, and need not involve the end user at all. The subsidy is, however, marketed and intended to support uptake of the product and make it affordable. Such a model may conceivably be negotiated for all schools and Colleges, or subsidies may be offered to targeted schools or Colleges applying clustering criteria as appropriate.

In this model, the onus to encourage uptake and so make use of the subsidy vests with the content developer, distributor, or vendor. They are still paid on a per-licence or per-sale basis, and so are incentivized to ensure appropriate uptake levels. A disadvantage is that vendors carry some of the risk of potential low uptake levels, and this can increase their per-user or per-licence pricing.

5.5.3 Option Four: Loans

While it is theoretically conceivable that schools or Colleges or individual learners or educators may make a financial loan for content procurement, given that the investments required for individual content purchases are likely to be small, this option is highly unlikely to be used and hence is not considered in more detail.

5.5.4 Option Five: Vouchers or Credits

Here, agents issue vouchers or content credits to schools, Colleges, or educators, which are then redeemable by making content purchases. The content for which credits can be redeemed may be regulated through approval processes as described above.

A voucher or credit system may either be administered at an individual educator level or at the school or College level. At the individual level, each educator would be allocated credits for content purchases. At the school or College level, credits would be allocated to the school or College, which would decide on purchases by engaging their educators on what content is required. Given that curriculum and content planning tends to take place at the subject specialization level with support of heads of department, a school- or College-level model is likely to be more appropriate for LTSM purchases. However, where individual educators are being encouraged to participate in communities of practice, as well as to share and review content resources with colleagues, an individual educator credit system may be a useful incentive mechanism.

The advantage of this model is that it puts the power of choice for content to be procured in the hands of the school or College or individual participant. The advantage of administering a credit system at the school or College level is that the school/College is empowered to direct the content direction and requirements of its member educators. This system also allows State guidance and intervention in what types of content are procured. For example, credits may be associated with digital LTSM and digital educational content as a mechanism to encourage use of this particular kind of content. Schools and Colleges are still free to make other content purchases, but are incentivized to try to participate in digital content offerings.

5.5.5 Option Six: Educator Secondments

Another option in paying for content development and distribution is to use available educator resources within the system, facilitating educator secondments to content development projects. Most educational content development agencies make use of educators at various points in the content development and distribution process. Educators may use this as a means of supplementing their teaching income, or it may remove them from the school or College system. Seconding educators to this role, and so keeping them within the system while offering them a professional development opportunity and a break from the classroom, would be an attractive alternative. The advantage is that this is a cost-effective mechanism to develop and/or review and regulate educational content. Educators are also afforded a break from the classroom context to broaden their experiences. They may be more likely to use digital content on their return to the classroom given their exposure to its development and/or review, and so to influence colleagues in ICT uptake. Using educators in the system means that they are fully aware of the classroom contexts in which content is intended to be used. They are thus likely to be pragmatic in assessing and providing guidance regarding content relevance.

Educators may also be seconded to mentor and stimulate effective use of content. The new content environment becomes less about selecting and using content, and more about contributing to communities of practice and sharing content resources. Seconding educators to support specific communities of practice and to provide training and support on content use in Schools and Colleges may be a cost-effective means of stimulating changes in practice at school and College levels. By seconding rather than employing educators to this role, multiple sets of educators can be brought into the content support process and then re-integrated into the school or College context. Secondments are of a fixed duration, and can be scaled up or scaled down as capacity requirements change over time.

The disadvantage of this model is that educators are unlikely to have specialist content and instructional design skills, and may require professional development support to fulfil their content development roles adequately. This may, however, be overcome by ensuring appropriate management and support structures for them in the content development team. High turnover of secondments may mean that content development teams are unable to sustain momentum and build common purpose. Again, this can be overcome if secondments are for a reasonable length and if new recruitments are staggered rather than taking place simultaneously.

5.6 Type of Procurement

Finally the type of procurement transaction needs to be considered. The generic options, as outlined above, are of relevance to content and curriculum:

- In-house school or FET College;
- In-house national Department of Education;
- In-house provincial Department's of Education;
- Outsourcing – other government departments;
- Outsourcing – Private Party;
- Public Entity;
- Public-Public Partnership;
- Public-Private Partnership; and
- Privatization.

Their characteristics have been explained above, so are not be repeated here.

5.7 Curriculum and Content Procurement Models

Considering each of the above dimensions, various possible procurement models are available, depending on options selected for each dimension of consideration. The following matrix provides a summary of the procurement options for each dimension:

Table 18 Matrix of procurement models for curriculum and content

1. Procurement Agency: Who is empowered to procure?	Agency option 1: Top Down Agency (national)	Agency option 2: Middle Down Agency (provincial or district)	Agency option 3: Bottom-up School or College Level Agency	Agency option 4: Individual Agency	
2. Offerings: What can be procured? How is this regulated if at all?	Offering options 1: Open Market	Offering option 2: Approved developers or publishers	Offering option 3: Approved content products and services	Offering option 4: Educator-led regulation	
3. Pricing	Pricing option 1: Once off payment for use in perpetuity	Pricing option 2: National bulk licensing agreement	Pricing option 3: Licensing or subscription agreement	Pricing option 4: Price negotiated shift competition away from point of sale	Pricing option 5: Zero end user
4. Financing	Financing option 1: Direct procurement	Financing option 2: Subsidies	Financing option 3: Loans	Financial option 4: Vouchers or credits	Financial option 5: Educator secondments

It is feasible, for example, that there could be a procurement model where:

- There is top-down agency, with the national or provincial Department of Education procuring the services of a content development agency or negotiating a bulk licensing agreement (agency option one);
- Only content products that appear on approved lists may be procured (offerings option three);

- The pricing and costing considerations are agreed and the price charged per participant is zero (pricing option five);
- Schools are given eLTSM credits as an incentive to purchase digital content resources (financing option four).

Alternately, a procurement model might involve:
- Individual educators being seconded to a national educational content project (financing option five);
- These educators review existing educational content, rate its relevance and associate it with the relevant element of the NCS or NCS (vocational) (offering option four);
- Educational resources are published free of charge for use by any educator (pricing option five);
- Individual educators are incentivized to use the freely available content through the accumulation of e-LTSM credits (financial option four).

Using the variables outlined in the above matrix, multiple procurement models for curriculum content can be developed. Drawing from the above, specific, preferred procurement strategies are indicated to implement the recommendations for curriculum and content.

5.8 Recommended Curriculum and Content Procurement Model

5.8.1 Curriculum

It is anticipated that any curriculum processes would be implemented through the normal procedures used by the national and provincial Departments of Education to procure specialist curriculum development services and to facilitate consultation with key stakeholders. Consequently, there should be no need for special procurement procedures, although it is likely that earmarked funding would be necessary. Implementation of the proposed recommendations also does not involve significant upfront capital investment. While there is a need for curriculum guides on how to integrate ICT into each content focus area (learning area, subject or FET College course), these guides may be developed by being commissioned through the national or provincial Departments of Education. As curriculum is a national competence, and provincial variation is unlikely to be significant enough to justify duplication in content development investment for the guides, it is recommended that the guides be developed by the national Department of Education. It is important that these guides are freely available in the public domain and that the intellectual property resides with the Department of Education. Given the need for both printed and digital versions of guides, there may be an opportunity to secure sponsorship for printing and distribution of the guides in exchange for limited branding in the guide (for example, on the back covers), which is then clearly marked as advertising. This approach would involve the private sector in financing of curriculum guides as a marketing exercise, but the curriculum development process would be driven by the DoE (and not in partnership with the sponsors). For these reasons, a PPP is not considered suitable in respect of the curriculum options for the e-Education Initiative.

So the recommended procurement model for curriculum is to maintain the status quo, where development of curriculum policy and guidelines is conducted by the national Department of

Education through consultative exercises and by contracting appropriate expert consultancy services. Provincial Departments of Education should remain responsible for providing curriculum support through their curriculum units, district offices, and teacher centres.

5.8.2 Content

In reflecting on the viability of the procurement of PPPs for the content activities, some recommendations lend themselves to PPP procurement, while others clearly do not. Content recommendations where a PPP is clearly not suitable for implementation include:

- Recommendation One: Establish which ICT applications require national standardization and procure these nationally.
- Recommendation Four: Include a special category of LTSM materials – e-learning materials or e-LTSMs – into the LTSM approval processes.
- Recommendation Five: Continue national management of Thutong as a repository of freely available educational content for the schools and FET College curriculum and as the location of online communities of practice for educators and learners.
- Recommendation Six: Invest in priority content development focus areas to expand the range and variety of high quality, freely available educational resources (printable and computer-based) accessible on Thutong.

A PPP is not considered suitable to implement *Recommendation One: Establish which ICT applications require national standardization and procure these nationally.* As this work would need to be completed as part of business applications development processes within the Department of Education, it is not considered feasible to procure this as a separate PPP, given the relatively low scale of investment required.

Regarding *Recommendation Four: Include a special category of LTSM materials – e-learning materials or e-LTSMs – into the LTSM approval processes*, analysis of options has demonstrated that this is again an area where identification of a single, preferred option is neither logistically practical nor educationally desirable. Given this, it is essential to create effective mechanisms to enable open competition between various players seeking to make their ICT applications and educational content available to schools and FET Colleges. Such a mechanism already exists to manage this process in the field of educational textbooks, so, as has been noted, it will be best to integrate procurement of ICT applications and digital educational materials into the LTSM process by creating a special category for e-learning materials – e-LTSMs.

A PPP is also unsuitable to implement *Recommendation Five: Continue national management of Thutong as a repository of freely available educational content for the schools and FET College curriculum and as the location of online communities of practice for educators and learners.* The national Department of Education manages Thutong as a national education portal for schooling and FET Colleges. It is recommended that the national Department of Education retains responsibility for content and curriculum management functions, but that appointment of a service provider to provide technical and hosting support be extended to at least three years for each appointment to ensure continuity in delivery of services. The low scale of investment required, as well as the relatively small size of Thutong, confirms that this recommendation does not warrant a PPP.

Recommendation Six: Invest in priority content development focus areas to expand the range and variety of high quality, freely available educational resources (printable and computer-based) accessible on Thutong is also not suitable for a PPP. In terms of this recommendation, it is proposed that the Department of Education should begin a series of structured investments to acquire high quality educational content that can be distributed freely via Thutong. As for the curriculum guides, it is important that the DoE retains control of the content development process and that the resulting Intellectual Property resides with the DoE, preferably under a Creative Commons Licence which allows for adaptations to be made over time and new products to be freely distributed for use in the system. Nevertheless, content development is a costly undertaking, and there are several Corporate Social Investment (CSI) Initiatives which would value funding the development of priority content areas in exchange for the right of association and including limited branding in the materials. Such branding needs to be clearly identifiable as advertising rather than embedded in the content, where its function as advertising may be lost to learners.

Should this approach be followed, guidelines on advertising limits should be made clear in sponsorship agreements with participating private sector partners. This would tap directly into marketing budgets of the private sector, creating a win-win situation for both role players. Nevertheless this is insufficient for a PPP, as the content development and resulting product should be owned by the Department of Education and the resulting materials should be freely available in the public domain. In addition, a PPP would restrict content development to a few service providers, which is not desirable when trying to facilitate access to a wide range of materials from which schools and Colleges may select. Also, once initial content has been developed, this can be used for several years before requiring substantive review. As such, while the curriculum remains unchanged, minimal maintenance and updating should be required for the materials. This provides a further argument that a PPP is not suitable for this recommendation.

Content recommendations where there may be potential for PPP procurement include:

- Recommendation Two: Identify ICT applications for use at school or College level that do not require national standardization, and integrate their acquisition into procurement plans for ICT infrastructure.
- Recommendation Three: Support growth of choice between proprietary and open source operating systems and office productivity suites and development of knowledge within learners about a range of ICT applications.
- Recommendation Six: Extend the Thutong Portal to include online ordering of digital LTSMs, as well as LTSMs in general.

For recommendations two and three, a PPP, while theoretically possible, is not recommended. These recommendations form part of the ICT Development Plans of schools and Colleges. Given this, the same considerations for a PPP as discussed under ICT options for Educators and Learners would be applicable. Therefore, on face value, a PPP does not seem suitable. However, if some level of standardization of ICT application options across schools and Colleges can be achieved, it will greatly assist the Institution in supporting the ICT application environment.

Considering recommendation two specifically, it is felt that, in order for schools to have meaningful choice in ICT applications, they should be able to select from a list of preferred providers. Bulk licensing agreements should be negotiated by the national Department of Education to allow these applications to be made available to schools and Colleges at the best possible prices. These agreements should make provision as appropriate for procurement of support services for relevant Open Source software products. Such a system of selection of bulk licences from a list of preferred providers does not lend itself to a PPP.

In terms of recommendation three, there are two related requirements: First, all infrastructure procured through the ICT Development Plans needs to be partitioned so that it can run both Open Source and proprietary operating systems and office productivity suites. Second, a FOSS migration strategy needs to be developed and implemented. The former can be achieved simply by making this a requirement in tenders for preferred supplier for all the relevant ICT models (see ICT Hardware Output Specifications), and does not require a PPP. The latter can be efficiently and independently conducted but procuring expert consultancy services through open tender where all relevant stakeholders are then able to participate as appropriate through consultative processes coordinated by the national Department of Education. Again a PPP is not considered appropriate.

We turn now to considering the viability of a PPP for *Recommendation Six: Extend the Thutong Portal to include online ordering of digital LTSMs as well as LTSMs in general.* While for the Thutong Portal as a whole, online access to lists of approved LTSMs should be managed by the national Department of Education, there is opportunity to explore a PPP for online ordering, purchasing, and delivery of LTSMs to schools and Colleges in support of this recommendation. Currently ordering of LTSMs operates provincially, and there have been improvements in administration of text book delivery, with growing numbers of schools having section-21 status to manage their own LTSM budget and to order directly from publishers and/or distributors. Timely textbook delivery remains a priority indicator for government service delivery. As such, there is a commercial opportunity to offer an online ordering, purchase, and delivery system which creates a seamless online interface between publishers/content developers and the schools or Colleges ordering from them. Stock management, processing of online ordering, and delivery or LTSMs is, however, not the core competence of the Department of Education.

As such two possible avenues could be pursued to realize this objective:

1) The national Department of Education takes responsibility for listing all of the provincially approved LTSMs, and simply directs schools and FET Colleges to the relevant publisher or distributor. The publisher or distributor is then responsible for processing the order, receiving payment, and making deliveries.
2) The national Department considers a PPP or outsourced arrangement with an appropriate private sector partner to offer a 'one stop educational resources shop', where ordering (although involving a range of publishers and distributors) appears seamless to the buyer. This would be a fully online service, listing all approved LTSMs (both physical and digital). It may be extended to include other educational resources such as stationery, sports equipment, and so on. This approach would facilitate tracking and allocation of e-LTSM credits, as all orders eligible for e-LTSM credits would be conducted through a single site. Participation as a publisher or distributor would be voluntary for those

developers that have LTSMs on the approved lists. They would, however, be expected meet certain performance criteria to maintain their participation status.

As such there is the potential to consider a PPP for fulfilment of this recommendation. However, this recommendation would most efficiently be realized by establishing an online purchasing and clearing house for school and College LTSM. As such, this type of service requires a relatively low capital investment. Consequently, these services are not considered to be suitable for a PPP. A properly designed outsourced arrangement is considered to be more viable.

With analysis of the viability of PPPs for each recommendation complete, it is possible to put forward proposed procurement strategies for content. The recommended procurement model for content to support the e-Education Initiative builds on the status quo with regard to existing processes for LTSM approval, but includes additional strategies to ensure that:

- ICT applications requiring national standardization are developed;
- Schools and Colleges are able to purchase ICT applications and digital content through their ICT Development Plans, making use of provincially issued e-credits to help to finance this;
- Schools and Colleges have greater choice over proprietary and open source operating systems and office productivity tools;
- The LTSM ordering process may be undertaken online, and include both general and digital LTSMs; and
- There is systematic investment to ensure that a wealth of freely available educational resources for educators and learners is made available through Thutong.

As such, it is recommended that only ICT applications which require national standardization be developed and procured centrally. In addition, the national Department of Education should negotiate bulk licensing agreements wherever possible for ICT applications, but provide a list of options from which Schools and Colleges may select when developing their ICT Development Plans. To enable school/College procurement of ICT applications and digital content, funding for the purchase of ICT applications and digital LTSM should be provided by provincial Departments of Education in the form of e-credits. These e-credits should be used as an incentive mechanism to encourage uptake of digital ICT applications and LTSM in support of the e-Education Initiative.

Further, it is recommended that the national Department of Education invest in content development to ensure that high quality digital resources are available free of charge via Thutong. This should be done by issuing open materials development tenders to encourage competition at the point of development and not at the point of sale. To supplement this, it should make use of seconded educators to support content development activities, materials review, and translation/language adaptation processes.

As with professional development, therefore, schools and Colleges will act as the primary agents in procurement of most ICT applications and LTSM. While developing their ICT Development Plans, schools and Colleges should:

- Receive information on which ICT applications are standardized nationally and will therefore be provided freely to schools and Colleges and supported by provincial Departments of Education;

- Access information on what ICT applications are available nationally, either freely or for purchase using e-credits, including details on any bulk licensing agreements;
- Access information on LTSM (general and digital) that has been approved by the Department of Education;
- Engage staff to determine LTSM requirements, making them aware of relevant e-credit incentives to procure digital LTSM; and
- Order LTSM through existing manual process or, in the longer term, online as part of a fully-fledged online LTSM ordering system.

In this model, individual schools and Colleges would not be precluded from procuring their own LTSM directly from vendors and publishers. However, to make use of e-credits, schools and Colleges should acquire LTSM through the provincial Department of Education or online.

In recognition of the need to provide guidance to individual parents and learners purchasing LTSM, the general public may also wish to make online purchases using the online LTSM system. Thus, it is recommended that this system be expanded to cater for such functionality, as it will provide individual consumers a measure of protection against poor quality materials, as well as guidance about appropriate choices. Furthermore, where LTSM has been approved by Departments of Education, this may be reflected in publishers' or vendors' marketing material directed at individual parents and learners.

Departments of Education (national and provincial) will play a regulatory role by reviewing available LTSM and approving them where they meet required standards or criteria. In the short term, the national Department of Education should model an appropriate process for review of digital LTSM, providing support to each province to integrate digital LTSM reviews and allocation of e-credits into their existing LTSM processes. In the long term, approval of digital LTSM will be undertaken by each province.

The national Department of Education will need to provide additional funding to provincial Departments of Education through the e-Education Initiative, at least in the short- to medium-term, to subsidize the e-credits procurement system that will be administered through school/ College ICT Development Plans. It will also coordinate investment in developing freely accessible educational resources to be made available through Thutong, in order to achieve economies of scale in producing and sharing Open Educational Resources (OER).

For each recommendation made for curriculum and content, there are output specifications which describe the products and/or services that need to be procured in order to implement the recommendation. Each output specification then has an associated proposed procurement strategy as outlined below.

Table 19 Output Specifications for Curriculum

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
1) National Curriculum statements for GET and FET Schools and FET Colleges are reviewed to develop ICT integration guidelines to support the attainment of the nationally defined ICT competency frameworks.	*Outsourcing – private party* Procurement of expert consultancy services through open tender. All relevant stakeholders to participate as appropriate through consultative processes coordinated by the national Department of Education.	National Department of Education	Recommendation One: Continue and expand the current policy to integrate ICT skills into all content focus areas in schools and FET College curricula.
2) A detailed review of how and where ICTs are required to support the attainment of the entire curriculum (GET, FET schools and FET vocational) is conducted. The resulting resourcing implications are documented and distributed as policy guidelines.	*Outsourcing – private party* Procurement of expert consultancy services through open tender. All relevant stakeholders to participate as appropriate through consultative processes coordinated by the national Department of Education.	National Department of Education	Recommendation One: Continue and expand the current policy to integrate ICT skills into all content focus areas in schools and FET College curricula.

Table 20 Output Specifications for Content

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
1) ICT applications which require national standardization are acquired and made freely available to schools and/or FET Colleges.	*Outsourcing – private party* Procurement of expert consultancy services through open tender. National Department of Education to procure specialized ICT application development services through an open tender containing a detailed functional specification of the proposed system, where customized applications are required specifically for the education system. Wherever possible and practical, preference should be	National Department of Education	Recommendation One: Establish which ICT applications require national standardization and procure these nationally.

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
	given to Open Source Software development. *Outsourcing – private party* Procurement of off-the-shelf products through open tenders. National Department of Education to negotiate bulk licensing agreements through open tenders where such products are required. These agreements should make provision, as appropriate, for procurement of support services for relevant Open Source software products.		
2) Schools choose relevant ICT applications when making their ICT Development Plans for ICT infrastructure.	*Outsourcing – private party* Preferred ICT applications to be selected by the national Department of Education as options that schools and Colleges can select when developing their ICT Development Plans. Bulk licensing agreements should be negotiated by the national Department of Education to allow these applications to be made available to schools and Colleges at the best possible prices. These agreements should make provision, as appropriate, for procurement of support services for relevant Open Source software products. *In-house provincial* Schools or College to be able to purchase/acquire ICT applications other than those preloaded on computing devices. Schools and Colleges should be allocated e-credits to support financing of these purchases via their ICT Development Plans.	National Department of Education to negotiate bulk licensing agreements. Provincial Departments of education to fund e-credits to support school or College acquisition of ICT applications.	Recommendation Two: Identify ICT applications for use at school or College level that do not require national standardization, and integrate their acquisition into procurement plans for ICT infrastructure.
3) All infrastructure procured through ICT Development	*In-house national* National Department of Education to make this	National Department of Education	Recommendation Three: Support growth of choice between proprietary

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
Plans is partitioned so that it can run both Open Source and proprietary operating systems and office productivity suites.	a requirement in tenders for preferred supplier for all the relevant ICT models (see ICT Hardware Output Specifications).		and open source operating systems and office productivity suites and development of learners' knowledge about a range of ICT applications.
4) A FOSS migration strategy has been developed and is being implemented.	*Outsourcing – private party* National DoE to procure expert consultancy services through open tender. All relevant stakeholders to participate as appropriate through consultative processes coordinated by the national Department of Education.	National Department of Education	Recommendation Three: Support growth of choice between proprietary and open source operating systems and office productivity suites and development of learners' knowledge about a range of ICT applications.
5) e-LTSMs are included on the provincial lists for approved LTSM.	*In-house national* National Department of Education to conduct a review of currently available e-LTSM to model an appropriate review process and to provide national guidelines and criteria for ongoing, annual e-LTSM approval processes. National Department of Education to support provincial curriculum units to include e-LTSM in their LTSM approval processes. *Outsourcing – private party* Administration/monitoring of annual e-LTSM reviews, as well as support to provinces in its implementation, to be conducted by expert consultancy services that are awarded through open tender (with successful bidders appointed for a minimum of three years to ensure continuity).	National Department of Education Provincial Department of Education	Recommendation Four: Include a special category of LTSM materials – e-learning materials or e-LTSMs – into the LTSM approval processes.
6) Schools and Colleges are incentivized to procure e-LTSM through allocation of e-	*In-house provincial* Provincial Departments of Education to allocate and fund e-credits to schools and	Provincial Department of Education	Recommendation Four: Include a special category of LTSM materials – e-learning materials or e-LTSMs – into

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
credits.	Colleges. *In-house national* The national Department of Education to provide an initial e-LTSM subsidy to provinces to fund this incentive scheme. It is anticipated that earmarked funding would need to be made available through the e-Education Initiative for at least the first six years of the Initiative.	National Department of Education	the LTSM approval processes.
7) Thutong is managed as a repository of freely available educational content for the schools and FET College curriculum and as the location of online communities of practice for educators and learners.	*In-house national and Outsourcing – private party* All content sourcing, review, monitoring, and moderation of communities of practice within Thutong to be conducted by the national Department of Education. A core dedicated national unit makes use of seconded educators and contracted expert management support services as required. *Outsourcing – private party* National Department of Education to secure technical and functional management and support services for Thutong, with a minimum duration of three to five years, to be awarded through open tender. This tender should be administered by SITA, as per requirements of the SITA Act. *Outsourcing – private party* Portal hosting services to be procured from SITA, as per requirements of the SITA Act.	National Department of Education SITA	Recommendation Five: Continue national management of Thutong as a repository of freely available educational content for the schools and FET College curriculum and as the location of online communities of practice for educators and learners.
8) LTSMs (digital and general) can be ordered and purchased online via Thutong.	*Outsourcing – private party* National Department of Education to secure services to design and develop a	National Department of Education	Recommendation Six: Extend the Thutong Portal to include online ordering of digital LTSMs, as well as

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
	comprehensive online LTSM ordering and delivery service through open tender. The tender should include a requirement for ongoing support services in maintaining the LTSM system for a period of at least three to five years. This tender should be administered by the Department of Education. Distribution services to be sub-contracted to a preferred service provider through open tender. LTSM system to be hosted by SITA as a transversal educational application of the Department of Education, as per requirements of the SITA Act.		LTSMs in general.
9) Thutong has a wide variety of high quality educational resources, both printable and computer-based, which are freely available.	*Outsourcing – private party* National Department of Education to secure expert services to develop priority content resources through open tender. Tenders should focus on shifting competition away from the point of sale to the points of development and production. Resulting products should be the property of the Department of Education, so that they can be released under a Creative Commons licence. Annual resources should be allocated to this activity with a view to ensuring that Thutong ultimately has a comprehensive set of curriculum support materials for educators and learners in all learning areas, subjects, and FET College programmes at all level of GET and FET. *In-house national and provincial:* National Department of Education to second educators	National Department of Education	Recommendation Seven: Invest in priority content development focus areas to expand the range and variety of high quality, freely available educational resources (printable and computer-based) accessible on Thutong.

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
	for one-year periods to support the above content development processes. Seconded educators could provide, by way of example, content development, materials review, curriculum relevance analysis, and translation support to the Department and/or to the above agency/agencies.		

5.9 Independent Assessment of Thutong Portal Recommendations Report

A request was made by the Department of Education for an independent assessment of the Thutong Portal recommendations outlined in the Feasibility Study on the e-Education Initiative for the South Africa public schools and FET College sectors. These recommendations relate very specifically to the resourcing requirements for the Thutong Portal as an integral part of the proposed Curriculum and Content Development (CCD) Pillar of the e-Education Initiative.

The assessment was written by a practitioner involved in the ICT-in-Education sector in South Africa and the rest of Africa over the past ten years. The assessor has also been a participant in the Feasibility Study for a brief period, mainly as a stakeholder, when she was working at Mindset Network and when stakeholders were required to participate in the Feasibility Study consultative workshops.

The assessment considered a range of background documents related to the e-Education Initiative in general, including the Needs Analysis conducted by KPMG and specific recommendations on Curriculum and Content Development within which the Thutong Portal recommendations are integrated. It also notes that the ICT sub-committee of HEDCOM has reportedly approved the recommendations in their current form.

In assessing the recommendations, the following questions were posed:
1) Are the recommendations sensible, logical and coherent?
2) Do the recommendations respond objectively to the resource needs of the Portal given its current and future role in the schooling and FET College system in South Africa?
3) Is there any evidence of explicit or implicit bias or preference in favour of any external service provider, whether in the long term or short term?

The report comments on the key recommendations in light of these questions.

It concludes on the positive note that, on the whole, the recommendations are indeed sensible, logical, and coherent, and that they respond to the central role envisaged for the Portal in the schooling and FET College system. In general, the assessment found no evidence of bias, explicit or implicit, towards preferred service providers with the exception of a specific reference to the DSTV education bouquet which may suggest bias towards Multichoice as a preferred service provider in the face of growing competition in the pay-TV sector. The assessment recognizes that any potential biases would be circumvented by rigorous adherence to government procurement policies which would give due consideration to levels of expertise, experience, and BBBEE compliance, inter alia.

The report proposes very minor adjustments to some of the recommendations and proposes endorsement of the recommendations and their inclusion as an annexure to KPMGs value assessment of the Thutong Portal recommendations including its cost models.

Refer to annexure B for the detailed report.

6 Monitoring, Evaluation, and Research Procurement

6.1 Introduction

Procurement considerations for monitoring, evaluation, and research need to be viewed from several perspectives:

1) Agency: Who is procuring? Who is the buyer or who is able to buy monitoring, evaluation, and research products and services?
2) Offerings: What is procured? What is available and offered as monitoring, evaluation, and research services? Is there any regulation or restriction in this regard?
3) Pricing: What is the price for these monitoring, evaluation, and research products and services and what are the pricing models?
4) Financing: How is this paid for? Who pays or subsidizes and with what terms?

Each is explained below.

6.2 Agency

In theory, monitoring, evaluation, and research functions may be procured by a range of actors:

- The national Department of Education;
- Provincial Departments of Education;
- Regional, district, or circuit level officials;
- Individual schools or Colleges.

Different options can be considered in this regard, as the following examples illustrate:

6.2.1 Option One: Top Down Agency (National Department of Education)

In this example, procurement takes place at the highest level of the education hierarchy. The monitoring, evaluation, and research agenda is set nationally, but may involve consultation with relevant provincial bodies and other key stakeholders.

The advantage of this option is that a systemic view is obtained and each element of monitoring, evaluation, and research can contribute to this broader national vision. The disadvantage of this model is that provincial, school, and College level actors may feel excluded or disempowered by the national agenda and unable to influence its direction within their areas of interest and research needs. This may be overcome if the national process is developed through stakeholder consultation and if the framework is reviewed through multi-stakeholder processes. In addition, the national framework may allow and budget for provincial and local level studies to be conducted and, while driven from the local and provincial level, may feed into the overall national agenda.

6.2.2 Option Two: Middle Down Agency (Provincial or District Level)

In this option, decision-making with regard to monitoring, evaluation, and research contracts is made at provincial or district level.

The advantage of this model is that monitoring, evaluation, and research questions are put forward at the implementation level. Provincial and district players are more likely to be engaged in contracts which they have requested and funded, as well as being more likely to engage with the findings and implement recommendations as they are seen as directly relevant to their context.

The main disadvantage of this option is the risk of unnecessary duplication, where each province is investing in design of common research frameworks, instruments, and approaches. In addition, the data and findings of different studies may not be standardized and, as such, cannot be aggregated to provide a national picture.

6.2.3 Option Three: Bottom-up School or College Level Agency

In this option, the school or College has decision-making power and funding to commission monitoring, evaluation, and research. School- and College-level monitoring and reflection is valuable, but, given financing constraints at this level, it is likely that such activities are undertaken through whole school evaluation processes or as part of monitoring and evaluation conducted by the school or College management team in fulfilling their professional roles. This may, for example, include reporting on progress against the ICT Development Plan. In the absence of this data being contributed to a broader provincial and national context, there would, however, be no basis for comparison.

6.2.4 Option Four: Individual Agency

In this option, individual educators or learners may procure monitoring, evaluation, and research services. Such undertakings are likely only to be driven by the individual interests of educators. By its nature, such research is likely to be micro-level research into classroom interactions using specific technologies and to include reflection on pedagogical practice.

Such mini case studies or reflections of experience could be encouraged and shared through online communities of practice or presented at events such as conferences or show cases. There is unlikely to be a monetary transaction for procurement of such evaluation and research activities, as they would only be undertaken if individual educators choose to do the work themselves. They may opt to undertake such research for their professional development or to access incentives related to this (such as completing a formal qualification or accruing CPTD points).

The advantage of this option is that it encourages reflective practice and may provide a wealth of local level, contextually rich data to share with colleagues and influence systemic policy. The disadvantage of this model is that, driven by individual interests, such an option

cannot be regulated, and it is difficult to make each element contribute to a national framework or picture, without imposing a national framework.

Another example of individual agency in the procurement is research work undertaken by postgraduate education students. These students may be employed in schools or Colleges as educators, or they may be completing full-time study programmes (B.Ed, M.Ed, or Ph.D programmes). These individuals decide on what to research and then undertake the work themselves. Again there is no procurement transaction. They are, in effect, appointing themselves. While their agenda will no doubt be shaped by their own interests and requirements for their programmes, there may be opportunity to guide their area of focus to enable this research to contribute to national or provincial processes. This may be done by providing incentive mechanisms such as small grants or bursaries to students undertaking research considered of relevance to the e-Education Initiative.

6.3 Regulating Offerings: What Can be Procured?

The second consideration pertaining to procurement models is 'what is offered?', or 'what qualifies as monitoring, evaluation and research?' This concerns whether there is any regulation on what can be researched and how research is undertaken.

6.3.1 Option One: Regulation Through Control of Funding

In this regulation option, the monitoring, evaluation, and research framework would guide the types of studies that would receive e-Education Initiative funding. Research and evaluation activities undertaken outside of this framework would not be eligible for this funding and would not require any regulation.

6.3.2 Option Two: Regulation By Requiring Provincial Permission for Studies

Currently, all studies that involve participation of schools and Colleges require the written permission of provincial Departments of Education. The disadvantage of this regulation option is that it adds a layer of bureaucracy to the implementing agent and may impact on research timelines. The advantage is that requiring permission from provincial Departments ensures that schools or Colleges are not inappropriately inconvenienced (by, for example, having to participate in research during examination time). It also helps to ensure that particular schools or Colleges are not inundated with research requests. The letter of permission also serves as a mechanism to introduce the research and helps the research agency to gain access to the school, as participants know that the work is departmentally sanctioned and/or requested.

6.3.3 Option Three: Individual Regulation of Participation

It is conceivable that individual schools or Colleges or their educators may be able to regulate whether or not to participate in monitoring, evaluation, and research activities. Indeed, the

educators' rights to choose their levels of participation in research should be respected as required by standard social studies ethics.

The advantage of this approach is that, by being given choice, when schools or Colleges opt to participate it is with their full commitment and they are likely to give their time and interest to the process. The disadvantage of allowing individuals to opt out of monitoring, evaluation, and research completely, however, is that it would severely undermine the e-Education Initiative monitoring, evaluation, and research agenda.

6.4 Pricing and Costing Models

Another consideration for procurement models is pricing:
- What is the overall cost?
- What is charged (price)?
- Which products and services are provided?

Pricing for monitoring, evaluation, and research tends to be negotiated on the basis of terms of reference agreed with the commissioning agent. This is influenced by the methodology and scale of the undertaking. There are also always departmental costs associated with undertaking research. These depend on the required and expected levels of input and participation by role players in the system (in particular officials and educators in schools and Colleges). In assessing possible methodologies for monitoring, evaluation, and research activities, the costs to the system in engaging educators in these administrative and reflective processes need to be weighed up in terms of the time taken and value added at that local level.

6.5 Financing: How is this Paid For?

Financing of monitoring, evaluation and research tends to be done by:
- Direct transactions against agreed terms of reference;
- Through research subsidies and grants; and/or
- Through using internal capacity.

6.5.1 Option One: Direct Transactions

In this option, terms of reference are agreed against a project plan with mutually agreed milestones. The advantage of this approach is that the methodology, purpose, and precise assignment can be negotiated up front and the cost of the activity fixed in the contractual agreement. The disadvantage is that changes in approach which may arise during the course of the investigation may have budget implications and require re-negotiation. Both parties then have to weigh up value against cost implications.

The disadvantage of this approach is that it tends to be costly. For example, if collection of monitoring data, which is an ongoing requirement, is financed using this option, it is likely to be extremely costly and unsustainable.

6.5.2 Option Two: Research Grants or Subsidies

Research and evaluation activity may be financed by providing research grants and subsidies. These may either be provided to institutions (such as HEIs or NGOs) or to individual researchers (particularly postgraduate students). The grant application may require that the research conforms to requirements as outlined in the e-Education Initiative monitoring, evaluation, and research framework.

The disadvantage of this option is that there is reduced control over the research process. The research is guided by the academic requirements of the HEI, and quality of the research output is largely dependent on quality of supervision and the individual student. An advantage is that this is a relatively inexpensive option. Further advantages are that this option allows for academic rigour and innovative research approaches, which may constructively challenge or improve the overall e-Education Initiative framework for future implementation.

6.5.3 Option 3: Internal Capacity – Creating a New Dedicated Monitoring, Evaluation, and Research Unit

Monitoring, evaluation, and research activities may be financed by employing additional departmental staff. Coordination and management functions for the e-Education monitoring, evaluation, and research framework may be conducted by a dedicated unit. This dedicated unit may either be internal or external to the Department of Education structures, but there is a dedicated monitoring, evaluation and research unit for the e-Education Initiative. If the e-Education Initiative management is external to the Department of Education, but accountable to the Department of Education, the dedicated unit would then also be external. If however, management of the e-Education Initiative is located internally within the Department of Education, then this dedicated monitoring, evaluation, and research unit would also be an internal structure.

An advantage of this financing approach is that implementation of the e-Education framework has a locus of responsibility and identified personnel responsible for its implementation. In a scenario where this is one element of the financing solution, this can be very effective. However this internal capacity should be kept small, with its main focus being on management and quality assurance, for this to remain an advantage.

If this is the only financing option – where all activities are undertaken by this dedicated unit – this option has several disadvantages. Expert skills are fixed, and so cannot be matched to each assignment. Additional capacity cannot be scaled up as required. A dedicated unit tends to remove monitoring, evaluation, and research functions from the logistical and operational functioning of e-Education implementation. Finally, monitoring, evaluation, and research outputs may be marginalized and viewed as separate from and unimportant to the ongoing management and reflection function across the Initiative.

6.5.4 Option 4: Internal Capacity – Gathering Data Through Existing Staff Members

In this option, data gathering activities may be financed by expecting submission of data through the day-to-day operations of key staff members. For example, data on infrastructure levels may be collected by school principals and FET College managers as part of their ICT Development Planning processes or via EMIS data submission. In the case of schools, this may be collated and verified by district levels officials. Similarly, collation and submission of monitoring data may be integrated into the reporting functions of project managers responsible for various aspects of the e-Education Initiative.

If done in support of management functions, this has the advantage of being both cost-effective and allowing for reflective management practice. A disadvantage of this approach is that data reporting may be biased and would require validation and monitoring to ensure its accuracy.

6.6 Monitoring, Evaluation, and Research Procurement Models

Considering each of the above dimensions, various possible procurement models are available for monitoring, evaluation, and research, each of which would depend on the options selected for each dimension of consideration. The following matrix provides a summary of procurement options for each dimension:

Table 21 Matrix of procurement models for monitoring, evaluation and research

1. Procurement Agency: Who is empowered to procure the research and M&E offering?	Agency option 1: Top Down Agency (national)	Agency option 2: Middle Down Agency (provincial or district)	Agency option 3: Bottom-up School or College Level Agency	Agency option 4: Individual Agency
2. Offerings: What can be procured? How is this regulated if at all?	Offering options 1: Regulation through control of funding	Offering option 2: Regulation through provincial permission	Offering option 3: Individual regulation of participation	
3. Financing	Financing option 1: Direct procurement	Financing option 2: Subsidies or grants	Financing option 3: internal capacity - a new dedicated unit	Financial option 4: internal capacity – building data reporting into professional development functions

Using the above matrix, multiple procurement models for monitoring, evaluation and research can be developed. Drawing from the above, specific, preferred procurement strategies are proposed to implement the recommendations for monitoring, evaluation, and research.

6.7 Recommended Monitoring, Evaluation, and Research Procurement Model

There may be merit in considering a dedicated research unit within the e-Education Initiative which functions as BECTA does in support of the United Kingdom Education Department. Although BECTA is an independent body, it is the preferred service provider for ICT-related monitoring, evaluation, research, and strategy for the United Kingdom government. However, it would be unnecessarily duplication to form an independent research body for the e-Education Initiative, and an internal unit to support this role would be more appropriate. A small staff complement provides continuity, and ensures that an overall monitoring, evaluation, and research framework is developed and implemented to serve the e-Education Initiative's objectives. In addition, the internal unit can ensure that monitoring processes and data collection activities are integrated into the daily management of e-Education Initiative project management.

While an outsourced programme management unit could take on this role, this has the disadvantage of removing monitoring, evaluation, and research functions from ongoing management of the e-Education Initiative programmes. This makes it harder to respond to findings emerging from monitoring and evaluation data and thereby adapt management practice and project approaches. An outsourced programme management unit would need to report into some Department of Education structure, and would create an additional bureaucratic layer between the e-Education Initiative and the monitoring, evaluation and research agencies being contracted to conduct specific monitoring, evaluation, and research assignments as outsourced by the e-Education Initiative. The unit would need to be resourced to be able to contract and outsource a range of research agencies to suit the particular needs of the identified research or evaluation study. In addition, the internal unit would need to be capacitated to develop easy-to-read guides and summaries of research findings for distribution and publication via Thutong in support of educators' professional development. As highlighted in the review of options for agencies undertake monitoring, evaluation, and research, the purpose and methodology adopted for research will inform which research agency or combination of research agencies is most appropriate for a specific assignment. For this reason, a PPP is not considered suitable.

The recommended procurement model for monitoring, evaluation, and research is that the e-Education Initiative framework be driven by the national e-Education Initiative management team (accountable to the national Department of Education). A multi-stakeholder body, including representation of provincial Departments of Education, should oversee implementation and review of the framework. The framework may include options for monitoring, evaluation, and research to be undertaken at provincial, district, and school/College level. Incentive mechanisms, such as research funding grants and subsidies, may be used to encourage this level of research output. However, the intention would be for all monitoring, evaluation, and research conducted to be collated nationally and disseminated in accessible and useful formats through Thutong and relevant professional development offerings.

As such, it is proposed that a small internal team be established to drive implementation of the framework and to ensure consultation and engagement with the multi-stakeholder body.

The monitoring requirements of the framework should be integrated into all relevant management and professional functions at national, provincial, district, and school/College levels.

This team should be supported at district level for collation of monitoring data from schools and Colleges and coordination of monitoring, evaluation, and research activities involving schools or College in the district.

By securing a ring-fenced budget to support implementation of the monitoring, evaluation, and research framework, specific assignments should be undertaken by either awarding research grants to relevant agencies (such as HEIs, provincial Departments of Education, educators, or students) or by commissioning consulting services through open tender processes.

The table below outlines a detailed set of output specifications to implement the recommendations made in the Options Analysis for this Pillar. Output specifications are presented that describe the products and/or services that need to be procured to implement the recommendation. For each output specification, an associated proposed procurement strategy is outlined, which takes into account the range of available procurement options presented for monitoring, evaluation, and research.

Table 22 Output Specifications for Monitoring, Evaluation, and Research

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
1) A comprehensive monitoring, evaluation, and research framework for the e-Education Initiative is in place.	*Outsourcing – private party* Expert consultancy services to be procured through open tender. The consultancy contract is to involve detailed engagement with national and provincial departments of education and the related e-Education Initiative management structure.	National Department of Education	Recommendation One: Design a comprehensive monitoring, evaluation, and research framework for the e-Education Initiative.
2) A multi-stakeholder body oversees implementation and review of the monitoring, evaluation, and research framework.	*In-house – national Department of Education* A small internal team to be appointed within the management structure of the e-Education Initiative to oversee management of the monitoring, evaluation, and research framework and to engage with the multi-stakeholder body. National Department of Education to convene a multi-stakeholder body through selection of individuals to represent various stakeholder interests (provincial Departments, other government Departments, labour unions, learners, civil society, private sector, and so on) through an open nomination process. The body should meet at least every six months to provide advice and guidance on implementation of the e-Education Initiative, thus providing the key mechanism for stakeholder communication and consultation.	National Department of Education	Recommendation Two: Establish a multi-stakeholder body which oversees implementation and review of this framework.
3) A ring-fenced percentage of the Initiative's budget is allocated to monitoring, evaluation, and research.	*In-house - national Department of Education* A small staff complement to be appointed by the national Department of Education to oversee monitoring, evaluation and research. However monitoring functions are integrated into all relevant project management functions at national and provincial levels.	National Department of Education Provincial department of Education, district and school and FET level responsibility for contributing to monitoring	Recommendation Three: Ring-fence a percentage of the Initiative's budget (somewhere between 2-5%) for monitoring, evaluation, and research, with dedicated percentages allocated to each of the three discrete functions.

Output Specification	Proposed Procurement Strategy	Responsible Agent	Linked Recommendation
	Outsourcing – Private Parties Specific monitoring, evaluation and research assignments to be undertaken by: • Awarding research grants to relevant agents (such as HEIs or provincial departments of education or individual educators); and • Commissioning consulting services from NGOs, HEIs, and/or private research companies as appropriate through open tender processes.	and evaluation processes.	

Annexure A: Supplementary Legal Due Diligence Report

Annexure B: Independent Assessment of Thutong Portal Recommendations