

Annexure to the Value Assessment report in respect of the Feasibility Study for an e-Education Initiative in South Africa

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Annexure A: Professional Development Assumptions

HEI Subsidies

The following budget was included in the financial model for once-off subsidies for higher education institutions (HEIs):

	Cost per Unit	Number of Units	Cost (excl VAT)
HEI funding subsidies (Capped lump sum subsidy allocation per HEI)	R 200,000	23	R 4,600,000

HEI once-off subsidies are intended to enable HEIs to produce educators entering the profession to have the necessary skills. The following assumptions are applied to these subsidies:

- 1) Subsidies would be provided for a one-year plan.
- 2) Subsidies would be capped at R200,000 per HEI.
- 3) The once-off subsidy system would operate for two years, but each institution would only be eligible for a single once-off subsidy during this period. This would ensure that institutions that do not make a successful application in the first year could receive grants in the subsequent year, having adapted their grant proposals satisfactorily.
- 4) Subsidies may be awarded for activities relating to enhancing the ICT integration into the programme offerings (i.e. teaching functions) for:
 - a) Infrastructure;
 - b) Curriculum and content – development and/or procurement;
 - c) Professional development for lecturers and academics relating to ICT integration (including exchanges);
 - d) Research which results in the development of professional development guides or learning materials.

e-PD credits

The following budget was included in the financial model for e-PD credits for schools:

Size of schools	Number of teachers	Proposed e-PD credit allocation (excl VAT)	Assumed notional hours which can be funded using e-PD credits	Assumed number of educators able to enroll in an e-PD funded 40 notional hour course (over the 3 year period)
Multi-grade schools (less than 50 learners; 1 teacher);	1	R 4,000	40	1
Multi-grade schools (51 – 100 learners; 2 to 3 teachers);	2-3	R 8,000	80	2
Small schools (101 – 200); up to 7 teachers);	up to 7	R 16,000	160	4
Medium schools (201 – 500); up to 16 teachers);	up to 16	R 32,000	320	8

Size of schools	Number of teachers	Proposed e-PD credit allocation (excl VAT)	Assumed notional hours which can be funded using e-PD credits	Assumed number of educators able to enroll in an e-PD funded 40 notional hour course (over the 3 year period)
Medium/large schools (501 – 1000); up to 30 teachers);	up to 30	R 60,000	600	15
Large schools (1001 – 1500); up to 50 teachers);	up to 50	R 100,000	1,000	25
Super large schools (1501 +; 50 + teachers).	50+	R 140,000	1,400	35

The following budget was included in the financial model for e-PD credits for FET Colleges:

Size of FET College	Proposed e-PD credit allocation (excl VAT)	Assumed no notional hours which can be funded using e-PD credits	Assumed number of FET educators able to enroll in a 40 notional hour course (over the 3 year period)
Very small College (fewer than 800 learners)	R16,000	160	4
Small College (801 – 1,600 learners)	R24,000	240	6
Medium College (1,601 – 2,400 learners)	R48,000	480	12
Big College (2,401 – 3,200 learners)	R72,000	720	18
Very Big College (more than 3,201 learners)	R96,000	960	24

As the FET College sector is set to grow, current national distribution of FET Colleges by size category is less relevant than its projected size. So, for national planning purposes, the target enrolment for FET Colleges of an average of 2,400 learners per College has been used to calculate the average e-PD credit allocation per FET College. These targets have not been reached, and will take some time to attain. As such, the medium College PD-credit allocation will be considered average. So an average e-PD allocation of R48,000 for each FET College can be assumed.

The following assumptions have been made with regard to the allocation of e-PD credits to schools and Colleges to support professional development:

- 1) The e-PD credits for schools would presumably roll out in tandem with implementation of ICT Development Plans at schools. It has been assumed that Plans will be submitted in three year cycles. Thus, the spread of these costs over time still needs to be determined within the overall model.
- 2) e-PD credits will be available to fund professional development opportunities for both educator and non educator staff.
- 3) The assumed average cost of professional development per educator for a 40 notional hour course is R4,000. As not all courses will be 40 notional hours in duration, a unit cost of R1,000 per ten notional hours per educator has been assumed. This figure is based on the following:
 - a) Review of the course costs structures presented in the submissions from professional development agencies in the expression of interest process;
 - b) The need for investments in design and materials for new courses;

- c) The expectation that courses will be offered on a large scale, but that contact sessions would have a maximum of 30 participants per group;
 - d) Courses are likely to include a blend of contact time, independent learning, and online and/or personal mentoring;
 - e) Courses are likely to take place within school contexts – using school-based or College –based ICT infrastructure.
- 4) The long term strategy for funding would be to have e-PD credits to be wholly allocated from provincial Department of Education professional development budgets.
 - 5) However, to stimulate and support provincial Department of Education investments in e-Education professional development in the medium term, funds allocated by the province will need to be matched by dedicated professional development funds for the e-Education Initiative over a period of at least nine years.
 - 6) E-PD credits will be allocated to schools and Colleges by provincial Departments of Education, using national norms and standards or guidelines. However the provincial Department of education will be able to top up these base level allocations to reflect provincial priorities.
 - 7) It is assumed that, over a three-year period, the number of educators accessing e-Education professional development will depend on school size (in bigger schools, more educators will participate). As such, the national guideline (norm and standard) for the base level e-PD credit allocation to schools will be based on size of the school. The proposed base level e-PD credit allocation (for a three-year period, corresponding with the ICT Development planning period) is presented in above.

The following assumptions have been made with regard to the allocation of e-PD credits for office-based educators at national, provincial, and district levels to support professional development:

- 1) e-PD credits will be available to fund professional development opportunities for both educator and non-educator staff.
- 2) e-PD credit requirements depend on the number personnel employed at each level of the education system. Not all office-based educators will take up e-Education professional development strategies in a single year, or funding cycle. However, e-PD credit allocations may be made annually and based on the following average allocations per personnel member:
 - a) National Department of Education: annual e-PD credit allocation of R500 per education official.
 - b) Provincial Department of Education: annual e-PD credit allocation of R500 per education official.
 - c) District officials: annual e-PD credit allocation of R500 per education official.The number of education officials has been calculated as the total number of non-educators per province from salary level 9 and above¹ as well as 30% of number of educators that have not been included in the school e-PD calculation (i.e. subject advisors), rounded to the nearest thousand.
- 3) Applying the assumed notional cost of R1,000 per ten notional hours of learning, presented for educators above, an average allocation of R500 per staff member could mean for example, that
 - a) All office-based educators should be able to participate in five notional hours of professional development per year; or

1 Source: Department of Education (Vulindela system) May 2008.

- b) 50% of office-based educators could participate in ten notional hours of professional development per year; or
- c) 10% of educators could participate in a structured learning intervention of about 50 notional hours of learning; or
- d) Any combination of professional development durations and distribution within the department or district as considered appropriate within the overall e-PD allocation to each structure.

Tenders

The budget parameters for all the envisaged professional development outsourcing tenders are:

- Tender A: National cost of R550,947.75 (including VAT) in year 1 or the development of expanded guidelines for training and professional development in ICT;
- Tender B: National cost of R17,863,560 (including VAT) spread equally over the first three years for the development of priority learning materials to support initial educators training and ongoing professional development;
- Tender C: District cost of R90,000 (including VAT) annually for ongoing mentoring and support, R546,000 (including VAT) required in three year cycles for the generic ICT leadership training at district level as well as the detailed curriculum focussed ICT leadership support.
- Tenders D and E: R2,000 (including VAT) once off per school for initial orientation and generic ICT leadership per year and R12,000 (including VAT) per school for support in developing ICT Development Plans every three years. Percentage of schools requiring detailed support in each ICT Development Planning cycle 80% for years 1-3, 60% for years 4-6, 50% for years 7 to 9, 40% for year 10 to 12 and 30% for year 13-15.
- R10,000 (including VAT) once off per FET College for initial orientation and generic ICT leadership per year and R12,000 (including VAT) per school for support in developing ICT Development Plans every three years. Percentage of schools requiring detailed support in each ICT Development Planning cycle as per schools above

Tender A: Development of Expanded Guidelines for Training and Professional Development in ICT

This is for the development of policy guidelines for four professional development in ICT for the following target audiences:

- FET College lecturers,
- Educational managers,
- Administrators, and
- District officials.

The following assumptions have been made in constructing a budget for this process:

- 1) This tender will build on the work conducted for the *Guidelines for Teacher Training and Professional Development in ICT*², but will extend these guidelines from the current focus on teachers, to include consideration for the above target audiences.
- 2) The development process will include a consultation process with provinces, HEIs, and professional development agencies.

² DoE, 2007, Guidelines for teacher training and professional development in ICT.

- 3) There will be savings in conducting the work for all four audiences simultaneously, so it is not expected that individual tenders are awarded for each target audience.
- 4) The policy guidelines are expected to include a review or public comment process and should be drafted in a format acceptable for formal policy submission processes.

TENDER A: Policy guidelines defining levels of competence for ICT use for all educators developed and approved.					
	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
External Personnel					R 299,000.00
Project manager - senior	days	R 3,500.00	15	R 52,500.00	
Project manager - junior	days	R 2,500.00	30	R 75,000.00	
Project administrator	days	R 1,500.00	15	R 22,500.00	
Policy developer	days	R 2,500.00	40	R 100,000.00	
Editor	days	R 2,000.00	5	R 10,000.00	
Communications, marketing or advocacy senior personnel	days	R 3,000.00	5	R 15,000.00	
Legislator / legal advisor	days	R 4,000.00	5	R 20,000.00	
Web developer	days	R 2,000.00	2	R 4,000.00	
Travel and events					R 121,250.00
Local car hire	daily cost	R 650.00	30	R 19,500.00	
Local subsistence per diem (single day travel)	daily cost	R 100.00	30	R 3,000.00	
Local air travel	roundtrip	R 2,500.00	30	R 75,000.00	
Local accommodation & subsistence	daily cost	R 750.00	30	R 22,500.00	
Local workshop (materials, venue, refreshments)	daily cost per participant	R 250.00	5	R 1,250.00	
Sub-Total					R 420,250.00
Add Overheads @	15%				R 63,037.50
New sub-total					R 483,287.50
VAT @	14%				R 67,660.25
TOTAL					R 550,947.75

Note: Overheads have been calculated as 15% of costs. These overhead calculations are designed to cover costs of project administration, office administration, reception facilities, office space and infrastructure, computer infrastructure, rates and electricity, telephone, fax, and e-mail costs, maintenance and upgrading of equipment, and other related overhead costs.

Tender B: Development of Priority Learning Materials to Support Initial Educators Training and Ongoing Professional Development

These learning materials are to be developed centrally to support the national priorities of the e-Education Initiative objectives. The following assumptions apply:

- 1) The learning materials will include national guidelines and information pertaining to the activities of the e-Education Initiative, procedures, templates and forms (online and hardcopy) and administration processes, for example:
 - a) Development and submission of the ICT Development Plans via the districts and provinces;

- b) Norms and standards and/or national guidelines pertaining to incentives for participation in professional development offerings such as the CPTD points system and e-PD credits;
 - c) Norms and standards and/or national guidelines on the availability of educational content via Thutong and the online LTSM ordering system;
 - d) Information of relevance to ICT and connectivity options and procurement, as required by this pillar of the e-Education Initiative.
- 2) In addition to the above, a maximum of six priority areas will be identified (for example targeting particular subject focus areas or learning programmes, inclusive education and rural and/or multi-grade learning environments, or health education) for materials targeting ongoing professional development.
 - 3) A maximum of four priority areas will be identified (for example foundation, intermediate and senior phase GET and then FET) for materials targeting initial educator training.
 - 4) For each priority area approximately 120 notional hours of course materials will be developed including a blend of multimedia and printable digital resources.
 - 5) The cost of development for course materials depends on the type of content being developed. As such, costs for development and production for different types of media have been considered: Simulation rich multimedia, dynamic computer-based multimedia; and print material. The budget for each content type if presented below, to provide a cost per notional hour of content.
 - 6) The cost of developing one notional hour of simulation rich multimedia content is estimated to be R51,000. This is based on the following budget allocations:

Simulation rich CBT content (one notional learning hour)					
	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
Personnel					R 38,800.00
Project Manager	hours	R 400.00	4	R 1,600.00	
Content Developer/Subject Specialist	hours	R 320.00	32	R 10,240.00	
Instructional Designer	hours	R 320.00	12	R 3,840.00	
Script Writer/Editor	hours	R 220.00	8	R 1,760.00	
External Reviewer/Evaluator	hours	R 250.00	8	R 2,000.00	
Graphic Designer/Animator	hours	R 250.00	12	R 3,000.00	
Web Developer	hours	R 250.00	28	R 7,000.00	
Computer Programmer	hours	R 375.00	16	R 6,000.00	
Data Capturer	hours	R 100.00	8	R 800.00	
Copyright negotiator	hours	R 320.00	8	R 2,560.00	
Sub-Total					R 38,800.00
Add Overheads @	15%				R 5,820.00
New sub-total					R 44,620.00
VAT @	14%				R 6,246.80
TOTAL					R 50,866.80

- 7) The cost of developing one notional hour of dynamic computer based multimedia content is estimated to be R18,500. This is based on the following budget allocations:

Dynamic Computer Based Multimedia content (one notional learning hour)					
	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
Personnel					R 14,090.00
Project Manager	hours	R 400.00	4	R 1,600.00	
Content Developer/Subject Specialist	hours	R 320.00	12	R 3,840.00	
Instructional Designer	hours	R 320.00	4	R 1,280.00	
Script Writer/Editor	hours	R 220.00	2	R 440.00	
External Reviewer/Evaluator	hours	R 250.00	4	R 1,000.00	
Graphic Designer/Animator	hours	R 250.00	2	R 500.00	
Web Developer	hours	R 250.00	12	R 3,000.00	
Computer Programmer	hours	R 375.00	2	R 750.00	
Data Capturer	hours	R 100.00	4	R 400.00	
Copyright negotiator	hours	R 320.00	4	R 1,280.00	
Sub-Total					R 14,090.00
Add Overheads @	15%				R 2,113.50
New sub-total					R 16,203.50
VAT @	14%				R 2,268.49
TOTAL					R 18,471.99

8) The cost of developing one notional hour of print material is estimated to be R9,500. This is based on the following budget allocations:

Print material (one notional learning hour)					
	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
Personnel					R 7,140.00
Project Manager	hours	R 400.00	2	R 800.00	
Content Developer/Subject Specialist	hours	R 320.00	6	R 1,920.00	
Instructional Designer	hours	R 320.00	2	R 640.00	
Script Writer/Editor	hours	R 220.00	2	R 440.00	
External Reviewer/Evaluator	hours	R 250.00	4	R 1,000.00	
Graphic Designer/Animator	hours	R 250.00	2	R 500.00	
DTP	hours	R 250.00	4	R 1,000.00	
Data Capturer	hours	R 100.00	2	R 200.00	
Copyright negotiator	hours	R 320.00	2	R 640.00	
Sub-Total					R 7,140.00
Add Overheads @	15%				R 1,071.00
New sub-total					R 8,211.00
VAT @	14%				R 1,149.54
TOTAL					R 9,360.54

- 9) The above notional costs for the different types of content have been applied to generate an average per notional hour cost of approximately R21,625 for a blend of multimedia and printable digital resources:

Type of content	Cost per notional hour of learning	Estimated no of hours	Total cost
Simulation rich multimedia material	R 51,000	5	R 255,000
Dynamic computer-based multimedia content	R 18,500	55	R 1,017,500
Print material, including assessment and tutorial design	R 9,500	60	R 570,000
Total notional hours of learning		120	R 1,842,500
Average (per notional hour for a blend of print and multimedia)			R 15,355

- 10) So, for each priority area described above, cost of development is estimated to be R15,355 per notional hour, for 120 notional hours, which is a total of R 1,623,960 per priority area. The total budget allocation for this tender is therefore R17,863,560:

	Number of priority areas	Cost per priority area (120 notional hours)	Sub total
e-Education Initiative guidelines, templates and learning materials	1	R 1,623,960	R 1,623,960
Ongoing professional development	6	R 1,623,960	R 9,743,760
Initial educator development	4	R 1,623,960	R 6,495,840
Total			R 17,863,560

Tender C: District ICT Leadership Training

The district level ICT leadership training is expected to ensure that district-level staff members are equipped to offer the required level of support to schools and FET colleges in attaining the e-Education Initiative objectives.

The draft Department of Education *Post Provisioning Norms for Districts* of January 2008 have been used to identify posts where such training would be required. It is assumed that, given the central role districts are expected to play in adoption and integration of ICT across curriculum areas, all district level staff responsible for curriculum support will require ICT-related training in their area of subject specialization.

The *Post Provisioning Norms for Districts* provides different post allocations depending on the number of learners enrolled for specific subjects, within the FET band. For example for Physical Science Mathematical and Computer Sciences, the post allocations are distinguished as follows:

FET CURRICULUM- Physical, Mathematical, Computer Sciences and Life Sciences			
No. Learners per group of subjects (FET Learners only)	No. Officials		No. Learners required to move to the next interval's allocation
	DCES	SES	
5000 and below	1	6	7000
5001-10000		8	12,500
10001-15000		10	
One additional SES for every 4500 learners above 15000			

For planning purposes, the median division (in the above example 5001-10000) is used to provide an approximation of the post allocations at a typical district. For national planning purposes a typical district is assumed to support 200 schools.

Using the above, the following table presents the typical post allocation for each curriculum area, and the assumed number of district officials that will require ICT leadership training:

	Deputy Chief Education Specialist (DCES)	Senior Education Specialist (SES)	Number of district officials requiring ICT leadership training
FET CURRICULUM- Physical, Mathematical, Computer Sciences and Life Sciences		8	8
FET CURRICULUM- Business, Commerce and Management Studies		5	5
FET Curriculum: Human and Social Studies		6	6
FET CURRICULUM- Communication Studies and Languages		8	8
FET CURRICULUM- Arts and Culture		7	7
FET CURRICULUM- Manufacturing, Engineering and Technology		6	6
FET CURRICULUM- Services		4	4
FET CURRICULUM- Agriculture and Nature Conservation		4	4
GET Curriculum: Intermediate and Senior Phase		13	13
GET CURRICULUM- ECD-Foundation Phase		8	8
Inclusive education	3	9	12
Institutional, Development, Management and Governance		6	6
Special Programmes and Co-curricular Activities		6	6
Total	3	90	93

District leadership training is envisaged to include an initial orientation to the e-Education Initiative and generic ICT leadership at district level. This will be followed by detailed structured learning on supporting schools and Colleges for the integration of ICT into specific phases and subject specializations in schools and Colleges. The detailed structured learning is expected to target approximately half of the district officials engaged in curriculum support services, in the first year. Thereafter the detailed structured learning for district officials will be repeated in three year cycles, to accommodate the remaining district officials in curriculum support, and new district official appointments. Both orientation and detailed curriculum-focused training is assumed to include a blend of face-to-face and online mentoring at centralized provincial venues.

The initial orientation will involve all district officials, and is expected to constitute approximately 20 notional hours of learning. The cost of R1,000 per educator per 10 notional hours presented earlier is considered to be relevant here given the generic and large scale nature of the intervention. As such the district official orientation training is estimated to cost R2,000 district official.

Detailed district level ICT leadership and curriculum-focused professional development will be directed at identified subject specialization groups, and is expected to be approximately 40 notional hours in total. The assumed cost of R1,000 per educator per 10 notional hours, is considered to be too low for curriculum specific district officials for two reasons:

- 1) No expressions of interests were obtained describing existing courses targeting district officials, and as such new course design will be required; and
- 2) District officials will need detailed training in the use of ICT in their subject specializations in order to offer curriculum support to schools and Colleges. This increases the course design costs considerably.

As such a cost of R2,000 per district official per 10 notional hours of learning has been assumed for the detailed district level ICT leadership and curriculum focused training. This professional development is therefore estimated to cost R8,000 per district official. In addition, given the pivotal role district officials are expected to play in supporting schools in harnessing education opportunities, an ongoing annual cost for supporting and mentoring district officials, once they have completed their structured programme is required. This is estimated to cost another R2,000 per district official per year.

The average cost per district for this e-Education support and structured learning is R636,000 per district, as presented in the following table:

	Number of district officials	Cost per district official	Total
Initial orientation and generic ICT leadership	93	R 2,000	R 186,000
Detailed curriculum focused ICT leadership training	45	R 8,000	R 360,000
Ongoing mentoring and support	45	R 2,000	R 90,000
Total			R 636,000

While the ongoing mentoring and support to districts is an annual cost, reinvestment in both the generic ICT leadership training at district level, as well as the detailed curriculum focused ICT leadership support is required in three yearly cycles.

Tenders D and E: Support in Developing ICT Development Plans

The following assumptions have been made regarding support that schools will require in developing ICT Development Plans:

- 1) Support will make a distinction between an initial orientation and further structured learning on ICT leadership focusing on completion of the ICT Development Plan for targeted schools.
- 2) Two managers from each school will participate in the initial orientation process.
- 3) The orientation is envisaged to take place with at least a one-day contact session and 10 notional hours of learning, and costs are estimated at R1,000 per manager.

- 4) It is assumed that in the first planning cycle 80% of schools will require support in completing their ICT Development Plans. Which schools will be are selected (or how schools will self-select) for this detailed structured learning course, will be decided by the Provincial Department of Education, based on their priorities.
- 5) Detailed support is envisaged constitute approximately 60 notional hours, including a blend of face-to-face and online mentoring at centralized school venues, estimated at R6,000 per manager.

The cost per school for this detailed support in developing ICT Development Plans is R14,000 per school, as reflected in this table:

	Number of school managers	Cost per educator	Total
Initial orientation and generic ICT leadership	2	R 1,000	R 2,000
Detailed support on ICT leadership and completing ICT Development Plans	2	R 6,000	R 12,000
Total			R 14,000

It is anticipated that, over time, the proportion of schools requiring detailed support will decline. As such, with every three year cycle for submission of new ICT Development Plans, all schools will be engaged in initial orientation and some generic leadership training. However, the following is expected in the requirements for detailed support:

	Percentage of schools engaged in initial orientation for each ICT Development Planning cycle	Percentage of schools requiring detailed support in each ICT Development Planning cycle
Years 1-3	100%	80%
Years 4-6	100%	60%
Years 7-9	100%	50%
Years 10-12	100%	40%
Years 13-15	100%	30%

The following assumptions have been made regarding support that FET Colleges will require in developing ICT Development Plans

- 1) Support will make a distinction between an initial orientation and further structured learning on ICT leadership focusing on completion of the ICT Development Plan for targeted FET College leaders.
- 2) Five educators from each FET College will participate in the initial orientation process.
- 3) The orientation is envisaged to take place with a one-day contact session and costs are estimated at R1,000 per manager.
- 4) All FET Colleges will be targeted for two participants to complete their ICT Development Plans. Which participants are selected (or how Colleges will self-select) for this detailed structured learning course, will be decided by the Provincial Department of Education, based on their priorities.
- 5) Detailed support is envisaged to be an approximately 60 notional hours of learning including a blend of face-to-face and online mentoring at centralized venues, estimated at R6,000 per manager.
- 6) As such the cost per FET College for the support in completing ICT Development Plans is R22,000:

	Number of FET College managers	Cost per educator	Total
Initial orientation and generic ICT leadership	5	R 1,000	R 10,000
Detailed support on ICT leadership and completing ICT Development Plans	2	R 6,000	R 12,000
Total			R 22,000

It is expected that an initial orientation and generic ICT leadership training will be tailored to the requirements of each new ICT Development planning cycle. However, detailed support on ICT leadership and completing ICT Development Plans will only be repeated at targeted FET Colleges in subsequent planning cycles.

	Percentage of FET Colleges engaged in initial orientation for each ICT Development Planning cycle	Percentage of FET Colleges requiring detailed support in each ICT Development Planning cycle
Years 1-3	100%	100%
Years 4-6	100%	60%
Years 7-9	100%	40%
Years 10-12	100%	20%
Years 13-15	100%	10%

Annexure B: Curriculum and Content Assumptions

Thutong Portal

Hosting of the Thutong portal should be provided by the State Information Technology Agency (SITA). As the Thutong portal is a government site, it needs to be managed according to government security standards, hosting protocols, and policies. Hosting includes bandwidth, rental of hardware, backup of data, firewalls and all relevant security to ensure that the portal is accessible to the Department of Education, educators, learners and school and College communities with reasonable download times.

The following assumptions have been made with regard to costing included in the financial model for the hosting of the Thutong portal:

- As schools and Colleges gain better and more ubiquitous access to ICT, uptake and traffic on the portal is set to increase substantially over time.
- Bandwidth and related hosting costs are set to decline substantially over time.
- The monthly cost for hosting the Thutong Portal in 2009 is estimated at R30,000 per month.
- Therefore taking into account the above, an additional escalation of 10% increase per year can be expected in hosting costs over time.

The resourcing implications for **maintenance and development** of the Thutong Portal are:

- 1) Ongoing maintenance and development costs for Thutong are estimated to be R150,000 per month (excluding VAT) for 2008, these will increase with inflation over time;
- 2) New development requirements, as outlined in the recommendations of the e-Education Initiative require an additional R900,000 for their development. This is broken down by specification as follows:

New functional requirement for Thutong	Estimated development cost
Integration of the SACE CPTD points system and e-PD credits system with the Thutong Professional Development space.	R100,000
Integration of the professional development structured learning materials, tools and guides developed as part of the Professional Development pillar of the e-Education Initiative.	R100,000
Development of tools and templates to allow each school and FET College to establish its own web presence, and a related database of South African schools which links to these and existing school websites.	R500,000
Development of online LTSM approval system for GET band (as is currently being developed for FET band)	R100,000
Integration of LTSM approval system with the online LTSM ordering and delivery service.	R100,000
Total	R900,000

- 3) At 2008 prices, the three-yearly technical overhaul is estimated to cost R1,000,000 (excluding VAT). Given that such an overhaul has just been completed, this will be required in 2011, 2014, 2017, and so on.

The following assumptions have been made about technical maintenance and development of the Portal, in order to determine its resourcing implications:

- 1) Given the dynamic and growing nature of the portal, it is expected that new functionality will be added to the Portal over time.
- 2) As the Portal is further integrated into the operational functioning of the Department of Education and as there are new development in technologies, ongoing investment in technical development of the Portal will be required.
- 3) Technical maintenance and development will require capacity building for Department of Education staff in effective use of new and enhanced features.
- 4) Given the technical nature of this work, it is important for contracts in the design and maintenance of the portal to be long term (at least three, but preferably up to five years) to allow for technical continuity the development of the appropriate relationships with the relevant departmental staff.
- 5) Every three to five years, it is anticipated that a thorough technical overhaul of the Portal will be required to keep up with new developments in technology.

The following table presents the budget required by the **Thutong Portal Directorate** to ensure that Learning Spaces are managed and growing repository of curriculum resources are available on Thutong. Note that this excludes annual increases as a result of inflation:

Year	Number of Managed Learning Spaces	Budget for contracting out Learning Space Managers and Critical Advisor roles	Budget for incentives, marketing and give-aways to encourage participation in Learning Spaces	Budget for travel	Total (excluding VAT)
Year 1 (2009)	20	R 12,000	R 240,000	R 600,000	R 852,020
Year 2	60	R 36,000	R 720,000	R 600,000	R 1,356,060
Year 3	100	R 60,000	R 1,200,000	R 600,000	R 1,860,100
Year 4	140	R 84,000	R 1,680,000	R 600,000	R 2,364,140
Year 5	180	R 108,000	R 2,160,000	R 600,000	R 2,868,180
Year 6	220	R 132,000	R 2,640,000	R 600,000	R 3,372,220
Year 7	260	R 156,000	R 3,120,000	R 600,000	R 3,876,260
Year 8	300	R 180,000	R 3,600,000	R 600,000	R 4,380,300
Year 9	300	R 180,000	R 3,600,000	R 600,000	R 4,380,300
Year 10	300	R 180,000	R 3,600,000	R 600,000	R 4,380,300

The following are the assumptions made:

- Incentives, marketing, and give-aways to encourage participation in Learning Spaces. This is budgeted at R1,000 per month per Learning Space (R12,000 per year in 2008).
- Travel to allow Coordinators to engage and support newly appointed Learning Space Managers and Critical Advisors, as well as to participate in conferences and other relevant events. This is estimated to be R60,000 year per Thutong Portal Development Coordinator.

It is expected that the number of Learning Spaces on Thutong will grow over time as more subjects, learning areas, and courses are added and active communities of practice emerge. The following growth of the number of Thutong Learning Spaces is considered feasible over ten years, given the current rate of development of Learning Spaces.

	Number of managed Learning Spaces
Year 1 (2009)	20
Year 2	60
Year 3	100
Year 4	140
Year 5	180
Year 6	220
Year 7	260
Year 8	300
Year 9	300
Year 10	300

As a key strategy for ensuring that Thutong is populated with learning materials to support the South African curriculum statements, a series of systematic investments in open educational materials to provide comprehensive curriculum support for priority learning areas is envisaged. For the purpose of this document, these are referred to as *Tender C: Content development tenders for priority content development processes* and are to be issued and managed by the e-Education Unit of the national Department of Education.

e-LTSM credits

For schools, the table below gives the e-LTSM credit break down per school size, which can then be used within the ICT Development Plan three year planning cycles:

Size of schools	Max no of learners	Proposed annual e-LTSM credit allocation (excluding VAT)	e-LTSM credit allocation for 3 year cycle of ICT Development Plan
Multi-grade schools (less than 50 learners; 1 teacher);	50	R 3,000	R 9,000
Multi-grade schools (51 – 100 learners; 2 to 3 teachers);	100	R 4,000	R 12,000
Small schools (101 – 200); up to 7 teachers);	200	R 6,000	R 18,000
Medium schools (201 – 500); up to 16 teachers);	500	R 12,000	R 36,000
Medium/large schools (501 – 1000); up to 30 teachers);	1000	R 22,000	R 66,000
Large schools (1001 – 1500); up to 50 teachers);	1500	R 32,000	R 96,000
Super large schools (1501 +; 50 + teachers).	2000	R 42,000	R 126,000

For FET Colleges, the table below gives the e-LTSM credit break down per college size, which can then be used within the ICT Development Plan three year planning cycles:

Size of FET College	Max number of learners	Proposed e-LTSM credit allocation	e-LTSM credit allocation for 3 year cycle of ICT Development Plan (excluding VAT)
Very small College (fewer than 800 learners)	800	R 18,000	R 54,000
Small College (801 – 1,600 learners)	1600	R 34,000	R 102,000
Medium College (1,601 – 2,400 learners)	2400	R 50,000	R 150,000
Big College (2,401 – 3,200 learners)	3200	R 66,000	R 198,000
Very Big College (more than 3,201 learners)	4000	R 82,000	R 246,000

Costs of e-LTSMs vary considerably, depending on the type of resource, licensing type, and educational duration and purpose. To illustrate this range, the following are provided as indicative unit costs for LTSM procurement:

- 1) DSTV education bouquet: Television, satellite dish installation, and no subscription charge
- 2) DSTV full bouquet subscription: Television, satellite dish installation, and monthly subscription fee of R450.
- 3) Music CD – R100 once-off cost.
- 4) Interactive literacy series – for one school year – R6,000 per year per 24 user licence.
- 5) DVD set – R200.

As such, it is not feasible to quantify eLTSM credit allocations by volume of e-LTSMs bought. A lump sum allocation made to a school can be used in multiple ways, and no set model will be imposed onto schools.

An international comparison provides some indication of levels of e-LTSM investment in developed country contexts. The United Kingdom has invested in Curriculum Online which provides e-Learning Credits (e-LCs) to schools. In general terms, each UK school is entitled to £1,000 (approximately R15,000) per year plus an additional £9.37 (approximately R150) per pupil for e-LCs. This has been operational since the 2002/3 school year and £330 million (approximately R5 billion) has been allocated by the UK government for this purpose.³ The e-LC system is set to stop in August 2008, and there are currently debates on how schools will be affected by this shift in policy.

The following assumptions have been made with regard to the allocation of e-LTSM credits to schools and Colleges to support procurement of digital content and ICT applications:

- 1) E-LTSM credits will only be available to fund approved digital educational content and ICT applications such as online and/or television subscriptions, CD-Roms, DVDs, interactive games, and learning resource series. They may not be used for physical LTSM resources such as books, stationery, physical posters, equipment, and so on.
- 2) The long term strategy for funding would be to have e-LTSM credits to be wholly allocated from provincial Department of Education LTSM budgets.
- 3) However, to stimulate and support provincial Department of Education investments in e-Education content in the medium term, funds allocated by the province will need to be

³ <http://www.curriculumonline.gov.uk/AboutELCs/WhatareeLCs.htm>

matched by dedicated e-LTSM funds for the e-Education Initiative over a period of at least nine years.

- 4) E-LTSM credits will be allocated to schools and Colleges by provincial Departments of Education, using national norms and standards or guidelines. However the provincial Department of Education will be able to top up these base-level allocations to reflect provincial priorities where appropriate.
- 5) It is assumed that a base e-LTSM credit level of R2,000 per school or College and R20 per learners per year would be considered reasonable to encourage investment in digital content for both schools and FET Colleges.

Tenders

The budget parameters for all the envisaged curriculum and content outsourcing tenders are:

- Tender A (Part 1): National cost of R550,947.75 (including VAT) in year 1 or review of ICT requirements in supporting entire curriculum;
- Tender A (Part 2): National cost of R550,947.75 (including VAT) in year 1 for developing a benchmark set of ICT competencies;
- Tender A (Part3): National cost of R4,222,600 (including VAT) in year 1 or curriculum guidelines and assessment tools;
- Tender B: National cost of R500,000 (including VAT) in year 1 for the development of FOSS migration strategy;
- Tender C: National cost of R632,500,000 (including VAT) over ten years for content development.
- Tender D: National cost of R250,000 (excluding VAT) as a seed capital budget for commercial relationship for online ordering of LTSMs.

Tender A: Development of Curriculum Guidelines, Assessment Tools, and Resourcing Plans

This tender will incorporate the following activities:

- 1) Identify how and where ICTs are required to support the attainment of the entire curriculum.
- 2) Describe and quantify the ICT access requirements and resulting resource implications for each GET phase, FET schools, and FET vocational. This should be based on findings of how and where ICT are required to support the attainment of the curriculum.
- 3) Develop a benchmark set of ICT competencies for learners in schools and FET Colleges.
- 4) Develop a set of curriculum guidelines and assessment tools to support educators in integrating ICTs into each curriculum area. This may be done for each learning area within a GET phase, for each grade for FET Schools and for each NQF level for FET schools. The guidelines and tools will include:
 - a) Application of the ICT competency benchmark frameworks for the learning area or subject;
 - b) Guidelines to provide support to educators on using ICT to support attainment of the curriculum statements and FET College programme; and
 - c) A series of standardized ICT skills assessment rubrics for each phase in GET level and each grade or NQF level at FET level.

The following table outlines that there are 243 subjects and learning areas in the South African Schools curriculum:

	GET			FET Schools	Total
	Foundation Phase (Grades R-3)	Intermediate Phase (Grades 4-6)	Senior Phase (Grades 7-9)	Grades10-12	
Number of grades	4	3	3	3	
Number of Learning Areas/Subjects	3	8	8	61	
Total	12	24	24	183	243

In terms of the FET Colleges curriculum there are 12 sub field each of which is made up of compulsory and optional subjects. There are therefore a possible further 213 priority Curriculum Statements for the FET Colleges:

	FET Colleges			Total
	Level 2	Level 3	Level 4	
Sub fields	12	12	12	36
Compulsory subjects across all sub fields	41	41	41	123
Optional courses across all sub fields	30	30	30	90
Total				213

Consequently, a total of 256 curriculum statements will need to be considered in this process. Although it may be possible to group these by either phase or by subject or learning area, each statement will need to be considered as part of the process. Groupings and categorization frameworks adopted may then be used to simplify the tasks of developing a set of curriculum guidelines and assessment tools to support educators in integrating ICT into each curriculum area.

It is anticipated that this element will comprise of three parts. These have been broken apart for costing purposes, but a single tender should be issued to ensure that each part relates coherently to, and draws on, work done in the other parts.

Tender A Part I: Review of ICT requirements in supporting entire curriculum

There are two key and related components to this:

- Identify how and where ICTs are required to support the attainment of the entire curriculum (256 learning areas or subjects, to be grouped by GET phase and FET schools and vocational).
- Describe and quantify the ICT access requirements and resulting resource implications for each GET phase, FET schools and FET vocational. This is to be based on the findings of how and where ICTs are required to support the attainment of the curriculum.

	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
External Personnel					R 1,252,000
Project manager – senior	Days	R 3,500	10	R 35,000	
Project manager - junior	Days	R 2,500	5	R 12,500	
Project administrator	Days	R 1,500	15	R 22,500	
Curriculum or subject matter expert	Days	R 3,000	384	R 1,152,000	
Editor	Days	R 2,000	5	R 10,000	
Financial modelling expert	Days	R 4,000	5	R 20,000	
Travel and events					R 145,000

	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
Local car hire	daily cost	R 650	30	R 19,500	
Local subsistence per diem (single day travel)	daily cost	R 100	30	R 3,000	
Local air travel	Roundtrip	R 2,500	30	R 75,000	
Local accommodation & subsistence	daily cost	R 750	30	R 22,500	
Local workshop (materials, venue, refreshments)	daily cost per participant	R 250	100	R 25,000	
Sub-Total					R 1,397,000
Add Overheads @	15%				R 63,037.50
New sub-total					R 483,287.50
	VAT @	14%			R 67,660.25
TOTAL					R 550,947.75

Tender A (Part II): Developing a benchmark set of ICT competencies

For this tender is recommended that the benchmark ICT competencies consider benchmarks for:

- GET Foundation phase;
- GET Intermediate phase;
- GET Senior phase;
- FET Schools; and
- FET Colleges.

As such, five benchmark frameworks will be defined, and will draw on the work conducted in Parts I and II. Like the policy guidelines for levels of competence for educators described in the Professional Development pillar, this process will require a consultation process. The budget for this is presented below:

	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
External Personnel					R 299,000.00
Project manager – senior	Days	R 3,500.00	15	R 52,500.00	
Project manager – junior	Days	R 2,500.00	30	R 75,000.00	
Project administrator	Days	R 1,500.00	15	R 22,500.00	
Curriculum experts/ policy developer	Days	R 2,500.00	40	R 100,000.00	
Editor	Days	R 2,000.00	5	R 10,000.00	
Communications, marketing or advocacy senior personnel	Days	R 3,000.00	5	R 15,000.00	
Legislator / legal advisor	Days	R 4,000.00	5	R 20,000.00	
Web developer	Days	R 2,000.00	2	R 4,000.00	
Travel and events					R 121,250.00
Local car hire	daily cost	R 650.00	30	R 19,500.00	
Local subsistence per diem (single day travel)	daily cost	R 100.00	30	R 3,000.00	
Local air travel	roundtrip	R 2,500.00	30	R 75,000.00	
Local accommodation & subsistence	daily cost	R 750.00	30	R 22,500.00	

	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
Local workshop (materials, venue, refreshments)	daily cost per participant	R 250.00	5	R 1,250.00	
Sub-Total					R 420,250.00
Add Overheads @	15%				R 63,037.50
New sub-total					R 483,287.50
VAT @	14%				R 67,660.25
TOTAL					R 550,947.75

Tender A (Part III): Curriculum guidelines and assessment tools

This component of the tender will draw on the work conducted in parts I and part II. It is envisaged that, for each of the 256 curriculum statements, the Learning Area or subject will be grouped by phase to align with the five benchmark ICT competency frameworks. Consequently, there will be approximately 86 sets of curriculum guidelines and assessment tools. To illustrate, each of the following will have a set of curriculum guides and assessment tools:

- Mathematics FET Schools;
- Technology GET Intermediate Phase;
- Literacy GET Foundation Phase.

These will include:

- Application of the ICT competency benchmark frameworks for the learning area or subject;
- Guidelines to provide support to educators on using ICT to support attainment of the curriculum statements and FET College programme; and
- A series of standardized ICT skills assessment rubrics for each phase in GET level and each grade or NQF level at FET level.

It is assumed that, for each of the 86 sets of curriculum guides and assessment tools, a subject matter expert would require five days to develop guidelines and five days to develop assessment tools. This includes working across three grades or levels within a phase or band, engagement with the outputs from parts I and II above, and interaction with the project team to ensure a coherent approach is adopted across the sets of guidelines and assessment tools.

Allocations have been made for editing and DTP layout, so that all elements are professional presented in a coherent guide to educators to support the existing curriculum statements. No allocation for the production of printed guidelines has been made. It is assumed that the guidelines will be published online, and that where printed distribution is considered appropriate, budget for this would be allocated from the Curriculum budgets of the national Department of Education.

	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
External Personnel					R 3,075,900
Project manager - senior	days	R 3,500	20	R 70,000	
Project manager - junior	days	R 2,500	10	R 25,000	
Project administrator	days	R 1,500	15	R 22,500	

	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
Curriculum or subject matter expert - for guidelines	days	R 3,000	430	R 1,290,000	
Curriculum or subject matter expert - for assessment tools	days	R 3,000	430	R 1,290,000	
Editor	days	R 2,000	86	R 172,000	
Design and layout for guides	days	R 2,400	86	R 206,400	
Travel and events					R 145,000
Local car hire	daily cost	R 650	30	R 19,500	
Local subsistence per diem (single day travel)	daily cost	R 100	30	R 3,000	
Local air travel	roundtrip	R 2,500	30	R 75,000	
Local accommodation & subsistence	daily cost	R 750	30	R 22,500	
Local workshop (materials, venue, refreshments)	daily cost per participant	R 250	100	R 25,000	
Sub-Total					R 3,220,900
Add Overheads @	15%				R 483,135
New sub-total					R 3,704,035
VAT @	14%				R 518,564.90
TOTAL					R 4,222,600

Tender B: Development of FOSS Migration Strategy

It is assumed that the FOSS migration strategy will cost R500,000 (excluding VAT), which will be incurred in year 1. The details of what this tender should include have been presented in the Options Analysis report.

Tender C: Content development tenders for priority content development processes

These tenders should focus on shifting competition away from the point of sale to the points of development and production. The resulting products should be the property of the Department of Education, so that they can be released under a Creative Commons licence.

The comprehensive coverage for identified priority areas is assumed to provide structured learning guides and educator support materials which support the delivery of the curriculum over the course of the school or College year. These materials would be predominantly in printed format, and available for download and on-demand printing for use by learners and educators at schools and Colleges. A small (no more than 10%) proportion of the content would be multimedia formats.

The rationale for these investments is to ensure that every learner in South Africa is able to access a comprehensive set of learning materials which covers the requirements of the curriculum. This is to be done at an affordable cost – designed to cover on-demand printing a distribution costs only, as the development costs and centrally funded by the Department of Education. A detailed argument for the necessity and economic value of such investments is presented in Annexure E of the Options Analysis attached as Annexure 8.

It is envisaged that annual budgets should be allocated to these tenders to ensure that Thutong ultimately has a comprehensive set of curriculum support materials for educators and learners in all learning areas and subjects, as well as FET College programmes at all levels of GET and FET.

As has been noted under tender A, there are 243 subjects and learning areas across grades in the South African Schools curriculum. There are a further 213 Curriculum Statements for each optional and compulsory subject for the FET Colleges for each NQF level. In addition, several areas have been highlighted as being important through this feasibility process where investment in content development is required as these might not be covered through an open market. As outlined in the Options Analysis component of this Feasibility Study process, these may include but not be limited to:

- 1) Translating existing digital educational material into priority indigenous languages in priority content areas, with a particular focus at needs in:
 - a) Home language materials at foundation and intermediate phases in GET;
 - b) Learning materials relevant to language programmes in senior phase GET and at FET levels.
- 2) Methods, tools, and support systems that facilitate learning for learners who experience barriers to learning (Output 27 of the Needs Analysis).
- 3) Methods, tools, and support systems that reduce the isolation and address the unique requirements of learners in rural and farm schools (Output 28).
- 4) Current and learner-focused health education materials, information, and resources (Output 29).
- 5) Standard expansion or 'content' packs for Office Suites to facilitate the needs of the curriculum and the classroom. This content pack could include templates, clip art, extensions, and sample documents. The recommended delivery mechanism would be a separate installer or package, which should also be downloadable via Thutong.
- 6) Development of educational materials for IT and CAT that use illustrative examples from Open Source products rather than their equivalent Microsoft counterparts (Recommendation 3 for content).these include:

This significantly increases the number of materials development processes. To illustrate, by considering translation of materials, so that at least the Foundation and Intermediate Phase materials are available in all eleven languages, there would be 360 sets of materials that would require translation / adaptation into languages other than English.

	Foundation Phase (Grades R-3)	Intermediate Phase (Grades 4-6)
Number of grades/ NQF levels	4	3
Number of Learning Areas	3	8
Total Learning Areas across grades (in English)	12	24
Number of languages (other than English)	10	10
Number of Learning Areas across grades in Languages other than English	120	240

This does not take into account language requirements for senior phase, FET schools and FET vocational, where the medium of instruction may not be English. Consequently, it is

reasonable to project that there could be approximately 500 sets of materials that require translation/adaptation into languages other than English.

Considering the listed cross-cutting priority issues – such as learners who experience barriers to learning; farm and rural education, health education which are relevant to all grades – a further 36 priority areas can be identified. Including the likelihood of new priorities being identified by Department of Education structures, it is assumed for planning purposes that a further 50 priority areas should be factored into the estimates for the number of resource packages that will require development.

The following table summarizes the estimated total number of resource development focus areas (considering a learning area, subject or course per grade or level):

GET Schools Learning Areas	60
FET Schools subjects	183
FET Colleges compulsory subjects	123
FET Colleges optional courses	90
Priority projects (cross-cutting issues)	50
Total (rounded off)	500
Estimated number of sets of material requiring translation or adaptation from English	500

The following assumptions have been made with regard to the cost of developing content:

- 1) The cost of development for course materials depends on the type of content being developed. As such, costs for development and production for different types of media have been considered: Simulation rich multimedia, dynamic computer-based multimedia; and print material. The budget for each content type is presented below, to provide a cost per notional hour of content.
- 2) The cost of developing one notional hour of simulation rich multimedia content is estimated to be R41,000. This is based on the following budget allocations:

	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
Personnel					R 32,640.00
Project Manager	Hours	R 400.00	4	R 1,600.00	
Content Developer/Subject Specialist	Hours	R 320.00	32	R 10,240.00	
Instructional Designer	Hours	R 320.00	10	R 3,200.00	
Script Writer/Editor	Hours	R 220.00	8	R 1,760.00	
External Reviewer/Evaluator	Hours	R 250.00	8	R 2,000.00	
Graphic Designer/Animator	Hours	R 250.00	10	R 2,500.00	
Web Developer	Hours	R 250.00	24	R 6,000.00	
Computer Programmer	Hours	R 375.00	12	R 4,500.00	
Data Capturer	Hours	R 100.00	2	R 200.00	
Copyright negotiator	Hours	R 320.00	2	R 640.00	
Sub-Total					R 32,640.00
Add Overheads @	10%				R 3,264.00
New sub-total					R 35,904.00
VAT @	14%				R 5,026.56

	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
TOTAL					R 40,930.56

- 3) The cost of developing one notional hour of dynamic computer based multimedia content is estimated to be R16,000. This is based on the following budget allocations:

Dynamic CBT content (one notional learning hour)					
	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
Personnel					R 12,450.00
Project Manager	Hours	R 400.00	2	R 800.00	
Content Developer/Subject Specialist	Hours	R 320.00	12	R 3,840.00	
Instructional Designer	Hours	R 320.00	4	R 1,280.00	
Script Writer/Editor	Hours	R 220.00	2	R 440.00	
External Reviewer/Evaluator	hours	R 250.00	4	R 1,000.00	
Graphic Designer/Animator	hours	R 250.00	2	R 500.00	
Web Developer	hours	R 250.00	12	R 3,000.00	
Computer Programmer	hours	R 375.00	2	R 750.00	
Data Capturer	hours	R 100.00	2	R 200.00	
Copyright negotiator	hours	R 320.00	2	R 640.00	
Sub-Total					R 12,450.00
Add Overheads @	10%				R 1,245.00
New sub-total					R 13,695.00
VAT @	14%				R 1,917.30
TOTAL					R 15,612.30

- 4) The cost of developing one notional hour of this type of print material is estimated to be R8,000. This is based on the following budget allocations:

Print Materials (one notional hour)					
	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
Project Manager	hours	R 400.00	2	R 800.00	
Content Developer/Subject Specialist	hours	R 320.00	6	R 1,920.00	
Instructional Designer	hours	R 320.00	2	R 640.00	
Script Writer/Editor	hours	R 220.00	2	R 440.00	
External Reviewer/Evaluator	hours	R 250.00	3	R 750.00	
Graphic Designer/Animator	hours	R 250.00	2	R 500.00	
DTP	hours	R 250.00	3	R 750.00	
Data Capturer	hours	R 100.00	1	R 100.00	
Copyright negotiator	hours	R 320.00	1	R 320.00	
Sub-Total					R 6,220.00
Add Overheads @	10%				R 622.00
New sub-total					R 6,842.00

Print Materials (one notional hour)					
	Unit Type	Cost per Unit	Number of Units	Cost	TOTAL
VAT @	14%				R 957.88
TOTAL					R 7,799.88

- 5) The number of notional hours required to support each priority area differs by grade and subject area. For example,
- In the Foundation phase, where there are only three learning areas, numeracy and literacy account for 75% of time spent at school and several activities adopt integrated approaches to their teaching. Assuming one hour a day of numeracy related activity for each day of the forty week year gives a 200 notional hours for grade 1 numeracy.
 - An FET College certificate programme (120 credits or 1200 notional hours on the NQF) comprises three fundamental subjects, and generally three compulsory and one optional subject. This results in approximately 170 notional hours per subject.
 - Considering grade 11 subject time in school, 3 to 3.5 hour per week are allocated per subject. Considering a 36- 40 week year, this results in about 120 notional hours per subject.

The details of the notional hour and scope of each priority area will be agreed and prioritized by the Department of Education. For costing purposes, an estimated 120 notional hours of curriculum support materials per priority area has been applied.

- 6) Considering that the materials development through these tenders will be primarily in printed format, the following table outlines that the estimated cost for developing materials for one curriculum statement is R1,165,000.

Type of content	Cost per notional hour of learning	Estimated no of hours	Total cost
Simulation rich multimedia material	R 41,000	5	R 205,000
Dynamic computer-based multimedia content	R 16,000	5	R 80,000
Print material, including assessment and tutorial design	R 8,000	110	R 880,000
Total		120	R 1,165,000

- 7) Language adaptation and translation costs are estimated at R100,000 per priority area. This assumes that this process will be supported by the seconded educators who are African language experts.

Therefore, over ten years, the following investments are required to content development to ensure coverage of the South African curriculum in schools and FET Colleges:

	Number	Cost per area	Total
Priority areas (in English)	500	R 1,165,000	R 582,500,000
Sets of materials requiring translation or adaptation from English	500	R 100,000	R 50,000,000

Note that these costs are reflected in terms of 2008 rates, and costs have not been increased to account for annual inflation.

Tender D: Commercial relationship for online ordering of LTSMs

This tender is intended to identify an appropriate commercial outsourcing partner to provide online ordering, purchasing, and delivery of LTSMs to schools and Colleges. The intention is to create a seamless online interface between publishers/content developers and the schools or Colleges ordering from them. Stock management, processing of online ordering, and delivery of LTSMs would be undertaken by the outsourced agency.

Setting up this type of service requires a relatively low capital investment – particularly where existing private sector companies (such as online ordering service providers, and courier or delivery companies for example) have existing infrastructure, systems and capacity in place. Ongoing revenue may be derived by levying a charge on delivery of LTSMs to schools. The margins on the charges levied to schools may be regulated by the department of Education and made clear in the tender documentation. Given that there will be ongoing revenue as the service is used, a small seed capital budget of R250,000 is considered sufficient for this tender.

Annexure C: ICT Infrastructure and Connectivity Assumptions

Introduction

Due to the nature and scale of the e-Education Initiative, as well as the overall implementation strategy to ‘push’ certain technologies while others are ‘pulled’ by schools and FET Colleges, certain assumptions had to be made to do the costing of the Initiative. Presented in this part of the document are the technical costs and assumptions made in the calculation thereof.

Cost projections were obtained through a consultative process with the transaction advisory team, discussions with State Information Technology Agency (SITA) and project management team members of the Khanya and Gauteng-Online (GoL) projects, and feedback received through an ‘Expression of Interest’ (EoI) process conducted with the private sector.

Costs incorporated were thoroughly workshopped through this consultative process, and regarded by all concerned to present a comprehensive and fair perspective on the full technical costs associated with the e-Education Initiative.

An approach that assumes a largely similar set of technological outputs / standards will be used in the rolling out of the Initiative, but will need to take into account the specific school/province context during implementation. Given these realities, the information provided below should be regarded as notional.

The model is, however, a flexible resource, which can be used to alter any, some or all of the assumptions on which the cost projection has been based. Thus, the spreadsheet from which these costs have been extracted has been submitted together with this report to allow the Department of Education to conduct ongoing modelling exercises using the model.

Overall Assumptions

The following assumptions were made during costing of specific items that make up the base costs:

- An average costing was used for the technical building blocks as per the description in the Norms and Standards, however, these costs can vary significantly depending on the device, model, supplier and/or manufacturer used.
- The average costing for the private sector was increased by 5% to allow for a procurement cost (contract cost, advertising cost, and so on).
- Based on our discussions with SITA, average public sector costs were assumed to be 7.5% more expensive than the average private sector cost. 11% was used to include procurement costs (contract cost, advertising cost, and so on). SITA also indicated that a general discount of at least 10% could be obtained on all hardware (ICT Infrastructure and LAN) as well as the WAN last-mile connectivity, while SITA provides a 50% discount on WAN backbone connectivity.

- Connectivity will be provided exclusively to Administrators, Managers, Educators, and Learners. The implications of use of school computers by the public or community were therefore not included.
- We assumed a 5% connectivity usage increase as users becomes matured users. History shows significant increases in bandwidth per mature user. These arise from the increasing demands of applications, and richer content, for example, an e-mail with a 2mb attachment or a web page with many images. SITA indicated that it is experiencing radical growth in government use in general. The model assumes that the Institution will implement good bandwidth management, and that telecommunications cost declines should offset the further costs of usage.
- All schools will require some level of building modification, physical security, and power upgrade.
- Costings are the same for every province, but SITA indicated that delivery costs might be different per province. This adjustment has been included in the clustering index for urban vs rural schools.
- Enterprise backup software is included at a cost of R500,000 (covering all schools), which recurs every three years. The cost of running back-ups for all schools is included in the WAN costs.

Connectivity Costs

The following table summarizes key assumptions made in respect of connectivity:

	Administration and Managers						
	Super large schools	Large schools	Medium/ large schools	Medium schools	Small school	Multi-grade 51-100	Multi-grade less than 50
Administrators	5	4	3	2	1	-	-
Principal	1	1	1	1	1	1	1
Total Users	6	5	4	3	2	1	1
12KB Internet/ Email per user	12	12	12	12	12	12	12
26KB Voice per user	-	-	-	-	-	-	-
64KB Data per user	64	64	64	64	64	64	64
364KB Video per user	-	-	-	-	-	-	-
Total KB required per User	76	76	76	76	76	76	76
Factor applied (as all users are not working concurrently)	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Total KB per size of school	304	253	203	152	101	51	51
Rounded based on increments of 64 KB	320	256	256	192	128	64	64
Last-mile Capex cost per annum	R4 470	R 4 470	R4 470	R4 470	R4 470	R 4 470	R4 470

	Administration and Managers						
	Super large schools	Large schools	Medium/ large schools	Medium schools	Small school	Multi-grade 51-100	Multi-grade less than 50
Last-mile Opex cost per annum	R28 489	R25 080	R20 064	R18 061	R16 057	R8 029	R8 029
WAN backbone Opex cost per annum	R38 637	R34 644	R34 644	R30 648	R26 652	R13 326	R13 326

	Educators and Learners				
	ICT LAB	Mini Lab	Classroom Clusters	Per Educator	Per Learner
Total Educator and Learner users per option	30	15	5	1	1
12KB Internet/ Email per user	64	64	64	64	64
26KB Voice per user	-	-	-	-	-
64KB Data per user	-	-	-	-	-
364KB Video per user	-	-	-	-	-
Total KB required per User	64	64	64	64	64
Factor applied (as all users are not working concurrently)	0.67	0.67	0.67	0.67	0.67
Total KB per size of school	1 286	640	213	43	43
Rounded based on increments of 64 KB	1 344	704	256	64	64
Last-mile Capex cost per annum	-	-	-	-	-
Last-mile Opex cost per annum	R69 526	R46 598	R21 120	R6 761	R6 761
WAN backbone Opex cost per annum	R102 535	R62 597	R28 884	R8 888	R8 888

The model assumes a net growth rate in use of connectivity and reduction in prices of 5% per annum. History shows significant increases in bandwidth per mature user. These arise from the increasing demands of applications, and richer content, for example, an e-mail with a 2mb attachment or a web page with many images. SITA has indicated that it has experienced a radical growth in government usage per annum. The assumption of 5% used assumes that (i) the Institution will implement good bandwidth management, and (ii) that telecoms cost declines will offset the further costs of usage above the 5% allowed.

The above costs are based on information obtained from SITA, and already include a 50% discount. The last-mile capital expenditure cost is based on a wireless cost of R10,000 and a wireless cost of R2,100. It is assumed that 30% of connections will be wireless.

Maintenance and Installation

Maintenance was based on Khanya and Gauteng-Online (GoL) projects of 10% of purchase price for equipment and 12.5% for buildings. Thus, an additional 10% was added for installation cost on hardware and software.

Running Cost / Consumables

The following running costs and consumables, directly or indirectly, contribute to the cost of the hardware being used:

	Unit Type/ description	Cost input R	Nr of units per year	Volume Discount %	Annual Cost R
3G Card	Monthly Fee	R400	12	15%	R4,080
Cost of additional battery	Per battery	R800	0.33	15%	R227
Electricity 100 Watts	Monthly Fee	R7.20	12	0%	R86
Electricity 1000 Watts	Monthly Fee	R72	12	0%	R864
Electricity 200 Watts	Monthly Fee	R14.40	12	0%	R173
Electricity 2000 Watts	Monthly Fee	R144	12	0%	R1,728
Electricity 400 Watts	Monthly Fee	R28.80	12	0%	R 346
Electricity 750 Watts	Monthly Fee	R54	12	0%	R648
Electricity for Air-conditioner	Monthly Fee	R380	12	0%	R4,557
Fax cartridge	Cartridge	R350	6	5%	R1,995
IT/ CAT Educational Software	Annual Licence Fee	R10,000	1	0%	R10,000
Other Educational Software	Annual Licence Fee	R50,000	1	0%	R50,000
Paper - fax machine	Box	R215	4	10%	R774
Paper - photo copier	Box	R215	32	10%	R6,192
Paper – printer	Box	R215	16	10%	R3,096
Printer cartridge	Cartridge	R350	6	10%	R1,890
Projector Bulb	Bulb	R4,975	1	10%	R4,478
Security Software	Annual Licence Fee	R150	1	20%	R120
Service Provider Contract	Monthly Fee	R300	12	15%	R3,060
Standard Telephone Line	Monthly Connection and Use	R137	12	0%	R1,646
Toner	Bottle	R800	6	10%	R4,320

Special Need Schools

The requirements of special need schools were not costed separately. Based on discussions with personnel from Khanya and GoL it was established that, even though the composition of the ICT Infrastructure selected would be different, costs would be similar. For example, an ICT Laboratory for a special need school would typically consist of only 15 specialist computers. These would be more expensive, but the overall cost for the specialist ICT Laboratory would be approximately the same as an ICT Laboratory with 30 computers.

Electricity

Certain costs will need to be incurred to get all schools to the same level of electrical power. Once all schools are at this level, additional cost will be incurred as part of the overall e-Education Initiative to ensure that electrical power meets acceptable levels for ICT use (surge protection, UPS, and so on), as well as the usage cost.

The cost to get all schools connected to electrical power falls outside the scope of the e-Education Initiative, but success of the Initiative is highly dependent on access to electrical power. Access to electrical power is a very significant dependency for this Initiative, and an indicative calculation was performed to approximate these costs.

A detail audit should be performed of all the schools to access their current electrical power status and their specific characteristics.

Assumptions made in the calculation were:

- All schools that were built after the date of the date of the source information (NIEMS database 2007) are electrified and do not need to be costed to get to the standard electrical power point.
- As the data indicates below, generators are not used excessively. Because of the health and safety risks inherent in the unsupervised use of generators, the model assumes the connection of all schools from small to super large schools to the grid and also assumes the use of 50% solar electricity and 50% grid for the multigrade schools.

Province	Multi-grade schools (less than 50 learners)	Multi-grade schools (51- 100 learners)	Multi-grade school/ Small schools	Medium schools	Medium/ Large schools	Large schools	Super Large schools
Limpopo	174	162	480	1 786	1 147	192	20
NW	148	130	280	588	461	129	7
Mpumalanga	135	127	152	535	705	258	27
Gauteng	6	17	55	360	900	533	142
EC	415	384	960	2 565	1 188	196	13
WC	98	93	104	308	489	319	37
NC	62	69	78	170	165	55	1
KZN	177	247	755	2 390	1 817	419	46
FS	694	93	64	205	412	201	8
Total number of Schools	1 909	1 322	2 928	8 907	7 284	2 302	301
% without power⁴							
Limpopo	39%	24%	12%	7%	2%	0%	0%
NW	16%	16%	8%	2%	1%	1%	13%
Mpumalanga	48%	38%	24%	10%	3%	2%	0%
Gauteng	33%	0%	3%	2%	2%	1%	1%
EC	59%	46%	44%	36%	21%	5%	8%
WC	1%	4%	0%	1%	0%	0%	0%
NC	22%	8%	1%	2%	0%	0%	0%
KZN	74%	68%	63%	37%	13%	6%	4%
FS	36%	11%	5%	0%	1%	2%	0%

Grid connection prices depend on how far the school is from the nearest sub-station. A detail audit should be performed of all the schools and their distance to the nearest sub-station. Owing to the wide range of distances that would be involved, the model assumes an average value of R10,000.

Solar cost depends on the amount of wattage required. Because solar is only used for the multigrade schools that require 2,850 watts (desktop 200 watts, laptop 200 watts, printer 200 watts, multifunctional printer 400 watts, multipurpose server 750 watts, SoHo backup 200 watts, small router 200 watts, small switched 200 watts and environmental rack 500 watts)

⁴ Source: Source - 2007 Snap survey

for Administrators and Managers. The total cost of the solar panels, regulator and batteries is R217,161. This is based on information provided by Plan My Power (Pty) Ltd.

The overall cost to get all schools connected to electricity before rollout of the e-Education Initiative is estimated to be approximately R180,513,558 as detailed in the table below:

	Multigrade schools (less than 50 learners) Rand	Multigrade schools (51- 100 learners Rand	Multigrade school/ Small schools Rand	Medium schools Rand
Grid connection				
Limpopo	338 761	193 154	569 921	1 287 207
NW	115 904	106 962	229 240	95 094
Mpumalanga	321 429	243 663	371 163	558 261
Gauteng	10 000	-	14 103	54 340
EC	1 228 861	882 500	4 206 213	9 235 575
WC	5 506	17 438	-	25 882
NC	68 305	27 600	10 685	32 075
KZN	652 105	840 136	4 783 333	8 952 061
FS	1 234 227	52 194	32 000	-
Solar				
Limpopo	7 356 563	4 194 545	-	-
NW	2 516 972	2 322 796	-	-
Mpumalanga	6 980 169	5 291 401	-	-
Gauteng	217 161	-	-	-
EC	26 686 049	19 164 443	-	-
WC	119 560	378 674	-	-
NC	1 483 319	599 364	-	-
KZN	14 161 172	18 244 464	-	-
FS	26 802 584	1 133 447	-	-
Electrical power source				
Limpopo	7 695 324	4 387 699	569 921	1 287 207
NW	2 632 876	2 429 758	229 240	95 094
Mpumalanga	7 301 598	5 535 064	371 163	558 261
Gauteng	227 161	-	14 103	54 340
EC	27 914 910	20 046 943	4 206 213	9 235 575
WC	125 066	396 112	-	25 882
NC	1 551 624	626 964	10 685	32 075
KZN	14 813 277	19 084 600	4 783 333	8 952 061
FS	28 036 812	1 185 640	32 000	-

	Medium/ Large schools Rand	Large schools Rand	Super Large schools Rand	Total Rand
Grid Connection				42 860 874
Limpopo	282 338	-	-	2 671 381
NW	59 870	10 403	8 750	626 223
Mpumalanga	181 126	40 952	-	1 716 593
Gauteng	171 756	32 699	10 677	293 574
EC	2 466 329	103 871	10 541	18 133 888
WC	13 181	13 750	-	75 756
NC	-	-	-	138 665
KZN	2 302 242	265 707	18 400	17 813 985

FS	41 303	31 082	-	1 390 807
Solar				137 652 683
Limpopo	-	-	-	11 551 108
NW	-	-	-	4 839 769
Mpumalanga	-	-	-	12 271 571
Gauteng	-	-	-	217 161
EC	-	-	-	45 850 492
WC	-	-	-	498 235
NC	-	-	-	2 082 683
KZN	-	-	-	32 405 636
FS	-	-	-	27 936 031
Electrical power source				180 513 558
Limpopo	282 338	-	-	14 222 489
NW	59 870	10 403	8 750	5 465 992
Mpumalanga	181 126	40 952	-	13 988 165
Gauteng	171 756	32 699	10 677	510 735
EC	2 466 329	103 871	10 541	63 984 380
WC	13 181	13 750	-	573 991
NC	-	-	-	2 221 348
KZN	2 302 242	265 707	18 400	50 219 621
FS	41 303	31 082	-	29 326 838

The above costs will increase for the multigrade schools once Educator and Learner computers are added due to an increase in solar connection with the following cost:

	Multigrade schools (less than 50 learners) Rand	Multigrade schools (51- 100 learners) Rand	Total Rand
Solar			119 697 985
Limpopo	6 397 011	3 647 430	10 044 441
NW	2 188 672	2 019 823	4 208 494
Mpumalanga	6 069 713	4 601 218	10 670 931
Gauteng	188 836	-	188 836
EC	23 205 260	16 664 733	39 869 993
WC	103 966	329 282	433 248
NC	1 289 842	521 186	1 811 028
KZN	12 314 062	15 864 751	28 178 814
FS	23 306 595	985 606	24 292 201

Software

Office Software

Until 31st March 2010, the office software included in the Symantec and Microsoft agreements is provided at no cost to Schools. After this date, it is assumed that the following office software will be used:

- Operating systems/ internet browsers;
- Office suite software;
- Application software;
- Security software; and

- E-mail services.

For every laptop/desktop (whether for administrators, managers, educators, or learners) the proprietary as well as open source office software cost was calculated.

The total cost of ownership of open source software is based on the Gartner research conducted in the Due Diligence report and is therefore assumed to be 85% of the total cost of ownership of proprietary software. The Options Analysis report recommends that a selective migration study be undertaken by the Institution in order to determine which systems should be proprietary and which open source. However for budgeting purposes a percentage split needs to be assumed in order to include the appropriate costs in the financial models. The proposed split between open source and proprietary software has been included in the main report. Localized school application software was included in the costing for Administrators and Managers, as well as Educators' computers (excluding learner laptops).

Educational Software

Educational software consists of:

- IT/CAT software; and
- Other educational software.

IT/CAT software and other education software were included in all ICT Laboratories, Laboratories, Mini Laboratories and classrooms with mini clusters of learner computers.

The proprietary and open source educational software cost was calculated.

ICT Infrastructure (Push Strategy)

Administrators and Managers

Each Administrator and Manager option was costed separately for each different size of school ranging from multimedia to super large schools.

The number of Administrator and Manager staff, as defined in the Option Analysis report, for each size of schools was used to determine the number of laptops / desktops required:

	Super Large schools	Large schools	Medium/ Large schools	Medium schools	Small School	Multigrade School	Small Multigrade school
Administrator/ Manager	5	4	3	2	1		
Principal	1	1	1	1	1	1	1

For every principal, a laptop was costed including a 3G card to give the principal remote access and a special padded laptop bag. For every Administrator/Manager, a desktop (a managed PC) was costed. All computers were given hardware security brackets and an access

control device (card/ bio-metric/ token) due to the nature of information that these computers might contain.

One monochrome laser printing device was included to give the principal secure printing in his/her office and two laser multifunctional print/scan/fax/copy machines were provided for at all medium/large, large and super large schools.

An initial capital investment was included for minor refurbishments and security concurrent with the rollout of ICT for Administrators and Managers at each school, amounting to R18,750 per super large, large and large/medium school, R12,000 per medium school and R7,500 per small school. No amount was provided for multigrade schools.

The rollout estimated for Administrators and Managers also provides for an initial capital investment for electrical power point(s), uninterrupted power supply, earth leakage, and surge protection at R6,250 per super large, large and large/medium school, R2,500 per medium and small school. No amount was provided for multigrade schools.

The cost of office software and localized application software was included for every computer.

Other cost items included are:

- Servers (including the LAN software);
- Routers, switches, LAN reticulation (with the assumption that the mix of wired and wireless networks will be 70% / 30%),
- Data points (one for every computer);
- An environmental rack providing air conditioning, fire protection and uninterrupted power (although all schools may not install environmental racks, a rack cost was used as a fair substitute for environmental costs associated with computer rooms).

None of these costs were included in the multigrade schools.

For WAN last-mile connectivity, each Management and Administrator user was given 76 KB allowance (12KB Internet/ Email per user and 64KB Data per user). The data line installation cost was received from SITA and it is assumed that 70% of schools will use a wired connection and 30% a wireless connection. An average monthly rental cost/ km/ bw as indicated by SITA was used with a 50% discount.

WAN backbone connectivity operating costs were based on costing received from SITA and the total KB per school type with a 50% discount. Whilst much has been said in the media regarding the potential for significant declining costs of connectivity, there is no certainty that this will occur. The model therefore takes a prudent approach and used assumptions on cost changes as have been provided by SITA.

ICT Laboratories

Every school offering IT/CAT will receive an ICT Laboratory. An audit of all eligible schools offering IT and CAT should be completed; this audit was not included in this Initiative's costs.

For the purposes of costing, the ICT Laboratory comprises: 30 managed client devices (including teacher), each with an access control device (card/ bio-metric/ token); one monochrome Laser printing device; one data/ video projector; one projector screen; one television set; office software and education software for every managed client device as defined above; a multipurpose server; 31 data points (30 managed client devices and one server); reticulation (cost of cabling assumed 70% wire and 30% wireless); one network server operating system; one enterprise backup system; one operating system backup; one active directory; one network access control system; R62,500 for an environmental rack (air, fire water and power); WAN last mile connectivity and WAN backbone connectivity allowance of 1,344 KB (64 KB per managed client device and as not everyone will work concurrent a factor of 0.64 was applied); 30 desks and chairs; 30 hardware security brackets; air-conditioning system; blinds/curtains; and a R184,000 initial capital investment covering refurbishment and security.

The cost estimate for ICT Laboratories also provided for an initial capital investment for electrical power point(s), uninterrupted power supply, earth leakage, and surge protection at R43,750.

The cost of office software and localized application software was included for every computer.

For the number of ICT Laboratories required and more detail on the calculation of the required IT and CAT Laboratories, refer to Due Diligence report.

ICT Infrastructure (Pull Strategy)

Educators and Learners

As part of the pull strategy, schools will use their allocated budget to choose from a catalogue of ICT Infrastructure and WAN last-mile connectivity options. To establish a budget per size of school the assumptions made are detailed below.

For the purposes of budgeting, a standard approach was taken that would provide each school with a fair ICT Infrastructure. Notwithstanding this, schools will be entitled to use budgeted funding to acquire the ICT Infrastructure from the catalogue of options that meets their specific needs. This means actual ICT Infrastructure acquired may vary from school to school.

Educators

In order to get to a notional budget for the Educator options, the following assumptions were made in order to achieve a one computer per educator by year 10 (as per Option Analysis report pg 374):

- Multigrade school with less than 50 learners: Laptops for Educators.
- Multigrade school with 50-100 learners: Laptops for Educators.
- Small school with 101-200 learners: Refurbishment of a staff/ educator room to support educators laptops and laptops for Educators.

- Medium school with 201-500 learners: Educator mini laboratories with 5 managed client devices as well refurbishment of a staff/ educator room to support educators laptops as well as laptops for some educators, moving towards laptops for all educators after 7 years (the managed client devices used in the mini laboratory have an asset life of 7 years, after which the laptop per educator option was assumed).
- Medium/ large school with 501-1000 learners: Educator mini laboratories with 10 managed client devices as well refurbishment of a staff/ educator room to support educators laptops as well as laptops for some educators, moving towards laptops for all educators after 7 years (the managed client devices used in the mini laboratories have an asset life of 7 years, after which the laptop per educator option was assumed).
- Large school with 1001-1500 learners: Educator mini laboratories with 15 managed client devices, refurbishment of a staff/educator room to support educators' laptops, as well as laptops for most educators, moving towards laptops for all educators after 7 years (the managed client devices used in the mini laboratory have an asset life of 7 years, after which the laptop per educator option was assumed).
- Super large school with more than 1501 learners: Mini laboratories with 15 managed client devices, refurbishment of a staff/educator room to support educators' laptops as well as laptops for most educators, moving towards laptops for all educators after 7 years (the managed client devices used in the mini laboratory have an asset life of 7 years, after which the laptop per educator option was assumed).

As noted above, these are general assumptions made to get to a fair budget amount per school size, which budget the schools can use to select the most appropriate option according to its needs from a catalogue of available options.

In order to calculate a budget amount from the assumptions above, the number of learners per school type was divided by 32 (as the average number of learners per educator) to get to the number of educators per school size. If the number of educators per school size was more than 5, the refurbishment of a staff/ educator room for an educator mini lab catering for 5-15 educators was assumed. Any additional educators were assumed to be allocated laptops. When the number of educators was fewer than 5, the assumption was a laptop per educator. Note that the combination of these choices will be different for each and every school and that the choice selection of a school will change over time.

Educator options for access to presentation equipment:

- Multigrade school with less than 50 learners: One data projector.
- Multigrade school with 50-100 learners: One data projector.
- Small school with 101-200 learners: One data projector.
- Medium school with 201-500 learners: Three data projectors, one electronic white board, and one trolley.
- Medium / large school with 501-1000 learners: One dedicated audio-visual room with a booking system, two trolleys, two electronic white boards and six data projectors.
- Large school with 1001-1500 learners: One refurbishment and equipping of an existing classroom for audio visual presentations, one dedicated audio-visual room with a booking system, four trolleys, two electronic white boards and ten data projectors.
- Super large school with more than 1501 learners: Two refurbishment and equipping of an existing classroom for audio visual presentations, one dedicated audio-visual room with a booking system, five trolleys, four electronic white boards and thirteen data projectors.

The take-up of choices described above is to get from the current ‘as is’ educator to computer ratio to the expected educator to computer ratio of 1:1 by year 10. It is assumed that no take-up will occur in the first year as this will mainly comprise the roll-out of ICT infrastructure for administrators and managers.

The following ratios were used per school size:

	Multigrade Less than 50	Multigrade 50- 100	Small	Medium	Medium / large	Large	Super large
Educator to Computer Ratio - Year 1 (as is)	20	20	20	20	20	20	20
Educator to Computer Ratio - Year 10	1	1	1	1	1	1	1

Learners

In order to get to a notional budget for the learner options, the following assumptions were made in order to achieve a computer to learner ratio of 1:15 by year 10 (as per Option Analysis report pg 374):

- Multigrade school with less than 50 learners: One classroom with mini cluster of learner computers (four managed client devices) and one learner mini-laboratory (15 managed client devices). The above assumption takes into account the specific needs of multigrade schools which result in a higher computer to learner ratio.
- Multigrade school with between 50-100 learners: One classroom with a mini cluster of learner computers (each of four managed client devices), one learner mini-laboratory (15 managed client devices) and one learner laptop. The above assumption takes into account the specific needs of multigrade schools which result in a higher computer to learner ratio.
- Small school with 101-200 learners: Three classrooms with a mini cluster of learner computers (each of four managed client devices).
- Medium school with 201-500 learners: Two classrooms with a mini cluster of learner computers (each of four managed client devices) and one learner mini-laboratory (15 managed client devices).
- Medium / large school with 501-1000 learners: One learner ICT Laboratory and five classrooms with a mini cluster of learner computers (each of four managed client devices).
- Large school with 1001-1500 learners: Two learner ICT Laboratories, two classrooms with mini cluster of learner computers (four managed client devices); one learner mini-laboratory or cluster (15 managed client devices) and two laptops.
- Super large school with more than 1501 learners: Three learner ICT Laboratories, two classrooms with mini cluster of learner computers (four managed client devices); one learner mini-laboratory or cluster (15 managed client devices) and one laptop.

As noted above, these are general assumptions made to get to a fair budget amount per school size, which budget the schools can use to select the most appropriate option according to its needs from a catalogue of available options.

In order to calculate a budget amount from the assumptions above, the number of learners per school was divided by the 10-year ratio of 15 learners per computer, and based on the number

of computers and number of computers provided by each option (laboratory offers 30 computers, mini laboratory 15 computers, classroom with mini cluster 4 computers and laptop 1 computer) the most appropriate combination was selected for costing purpose. The combination of these choices will be different for each and every school, and the selection of a school will change over time. Schools will make their choices, taking into account its specific needs, through completion of the ICT Development Plans.

The take-up of choices described above is to get from the current ‘as is’ learner to computer ratio to the expected learner to computer ratio of 15:1 by year 10. It is assumed that no take up will occur in the first year as this will mainly comprise the roll-out of ICT Infrastructure for Administrators and Managers.

The following ratios were used per school size:

	Multigrade Less than 50	Multigrade 50- 100	Small	Medium	Medium / large	Large	Super large
Learner to Computer Ratio - Year 1 (as is)	50	75	100	100	100	100	100
Learner to Computer Ratio - Year 10	15	15	15	15	15	15	15

Educator Options for Access to Computing Device

Refurbishment of staff/ educator room for educator mini laboratories

This includes:

- 5-15 managed client devices, 5-15 access control device (card/ bio-metric/ token) because of the nature of information contain on these computers (depending on the size selected);
- One monochrome laser printing device;
- Office software and educational software as defined above;
- A factor of 0.5 of the cost of a multipurpose server;
- LAN software, 6-16 data points (5-15 for the managed client devices and one for the server);
- Reticulation (assumed that 70% will be wired and 30% wireless);
- A factor of 0.1 of the cost of an environmental rack (air, fire, water and power);
- 704KB (64KB internet and email per user and as not everyone will work concurrent a factor of 0.64 was applied)) for WAN Backbone and WAN last-mile connectivity;
- 5-15 desks, chairs and security brackets;
- One safe;
- An allowance for blinds/ curtains;
- Air conditioning; and
- A once off amount of R162,500 for building infrastructure and security.

Refurbishment of a staff/ educator room to support educators laptops

This includes:

- One monochrome laser printing devices;
- 1-15 data points,
- Reticulation (assumed that 70% will be wired and 30% wireless);

- A factor of 0.5 of the cost of a multipurpose server;
- LAN software; and
- A once-off amount of R37,500 for minor building infrastructure and security.

1.1.1.1 Laptops for Educators

This option includes:

- A laptop;
- 3G card;
- Access control device;
- Application and localized school application software;
- 64KB per educator (voice and data KB and as not everyone will work concurrent a factor of 0.64 was applied);
- Padded laptop bag;
- Security bracket and laptop locker.

Educator Presentation Equipment Options

The refurbishment and equipping of an existing classroom for audio visual presentation option consists of:

- One desktop computer;
- One audio system;
- One data/ video projector;
- One projector screen;
- One television set;
- One DVD player;
- Application software for the desktop computer;
- An allowance for blinds/ curtains and
- A once off amount of R150,000 for minor building infrastructure and security.

Dedicated audio-visual room with a booking system consists of:

- One desktop computer;
- One audio system;
- One data/ video projector;
- One television set;
- One DVD player;
- Application software for the desktop computer;
- An allowance for blinds/ curtains and;
- A once off amount of R150,000 for minor building infrastructure and security.

Mobile audio-visual trolleys consist of:

- One desktop computer;
- One audio system;
- One data/ video projector;
- One television set;
- One DVD player and speakers;
- Application software for the desktop computer and trolley.

Electronic white boards consist of the cost of an interactive electronic whiteboard.

Data/ video projector consists of the cost of the data/video projector.

Learner Options for Access to Computing Devices

The **Learner ICT Lab** consists of:

- 30 managed client devices;
- An access control device (card/ bio-metric/ token) for every managed client device;
- One monochrome laser printing device;
- One data/ video projector;
- One projector screen;
- One television set, 30 headsets, 30 microphones;
- Application software for every managed client device as well as education software for every school as defined above;
- A multipurpose server;
- 31 data points (30 managed client devices and one server);
- Reticulation (assumed 70% wired and 30% wireless);
- One network server operating system;
- One enterprise backup and one operating system backup;
- One active directory;
- One network access control system;
- A factor of 0.25 of the cost of an environmental rack (air, fire, water and power);
- WAN backbone and last-mile connectivity at 1,344 KB (64 KB per managed client device KB and as not everyone will work concurrently a factor of 0.64 was applied);
- 30 desks and chairs;
- 30 hardware security brackets;
- Air-conditioning;
- An allowance for blinds/curtains;
- An allowance of R43,750 for electrical power points and uninterrupted power supply, earth leakage, surge protection;
- An amount of R262,500 initial capital investment required (refurbishment and security).

The **Learner mini-laboratory or cluster** option consists of:

- 15 managed client devices;
- An access control device (card/ bio-metric/ token) for every managed client device;
- One monochrome laser printing device;
- One data/ video projector;
- One projector screen;
- One television set, 15 headsets, 15 microphones;
- Application software for every managed client device as well as a factor of 0.5 of the cost of education software for every school as defined above;
- A multipurpose server;
- 16 data points (15 managed client devices and one server);
- Reticulation (assumed 70% wired and 30% wireless);
- One network server operating system;
- One enterprise backup and one operating system backup;
- One active directory;
- One network access control system;
- A factor of 0.15 of the cost of an environmental rack (air, fire, water and power);
- WAN backbone and last-mile connectivity at 704 KB (64 KB per managed client device KB and as not everyone will work concurrently a factor of 0.64 was applied);
- 15 desks and chairs;

- 15 hardware security brackets;
- Air-conditioning;
- An allowance for blinds/curtains;
- An allowance of R21,875 for electrical power points and uninterrupted power supply, earth leakage, surge protection;
- An amount of R162,500 initial capital investment required (refurbishment and security).

The **classrooms with mini cluster of learner computers** option consists of

- 4 managed client devices;
- One multiple-user computer device;
- An access control device (card/ bio-metric/ token) for every managed client device;
- One networked monochrome laser printing device of every 4 classrooms;
- 5 headsets, 5 microphones;
- Application software for every managed client device as well as a factor of 0.15 of the cost of education software for every school as defined above;
- A factor of 0.1 of the cost of a multipurpose server;
- 5 data points (4 managed client devices and a factor of 0.1 of a server);
- Reticulation (assumed 70% wired and 30% wireless);
- One network server operating system;
- One enterprise backup and one operating system backup;
- One active directory;
- One network access control system;
- A factor of 0.1 of the cost of an environmental rack (air, fire, water and power);
- WAN backbone and last-mile connectivity at 256 KB (64 KB per managed client device KB and as not everyone will work concurrently a factor of 0.64 was applied);
- 5 desks and chairs;
- 5 hardware security brackets;
- An amount of R81,250 initial capital investment required (refurbishment and security).

The **Learner Laptops** option includes:

- A managed laptop device;
- An access control device;
- One networked monochrome laser printing device (one for every 20 learners);
- One headset and microphone;
- Application software;
- 64KB per learner (internet and email KB);
- Padded laptop bag;
- Security bracket and laptop locker; and
- One rechargeable station for every 10 learners.