GUIDELINES FOR THE PLANNING, ESTABLISHMENT AND IMPLEMENTATION OF AN EFFECTIVE BLENDED AND REMOTE LEARNING SYSTEM IN A TVET COLLEGE

Compiled by: BLENDED LEARNING TASK TEAM
DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 PURPOSE

The purpose of this guideline includes the following:

• To identify and define the philosophy, scope, principles and procedures for the use of remote and blended learning environments for students and staff at public TVET colleges in order to improve student learning, student access and success.

• To provide information, best practices, hints and strategies for how TVET colleges may start their remote and blended learning journey.

• To provide information, best practices, guidelines and strategies for the improvement of TVET colleges who have started their remote and blended learning journey.

• To provide practical guidance to TVET colleges that will strengthen previously published Open Learning Policy Frameworks and visionary prospects on the implementation of blended and remote learning in the TVET sector, e.g. The White Paper on Education and Training (DoE, 1995), which “affirmed the Government’s commitment to opening up learning and removing barriers to education for those who had been disadvantaged by South Africa’s past (DHET, 2017c) as well as the Report Of The Commission Of Enquiry Into Higher Education And Training (DHET, 2017c) which provides a clear picture of the current legislative and policy environment that is in place to direct and regulate Open Learning in South Africa.

1.2 BACKGROUND AND CONTRIBUTORS

The use of technology to enhance teaching and learning has widespread support from many academic quarters. In addition, the use of technology is seen as being critical for implementing a successful remote and blended learning strategy. The advent of COVID-19 in the first quarter of 2020 accelerated the need for colleges to be able to offer remote and blended learning approaches. Dr Nick Balkrishen was requested by the TVET Branch in the DHET to co-ordinate a project aimed at developing strategies to equip
colleges with useful guidelines to successfully implement an effective remote and blended learning plan of action.

The main areas of focus were identified by a focus group comprising Dr Balkrishen, Mr Cassie Kruger and Mr Sello Sethusha. The details to the areas identified were developed by the Blended Learning Task Team (BLTT). The BLTT staff members were selected from the TVET colleges in North West (NW) and Mpumalanga (MP) Region (listed in Table 1).

**Table 1: BLTT members**

<table>
<thead>
<tr>
<th>NAME OF CONTRIBUTOR</th>
<th>POSITION</th>
<th>PLACE OF EMPLOYMENT</th>
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<tbody>
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<td>Gert Sibande TVET College</td>
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<tr>
<td>Dr Simon Mlangeni</td>
<td>Acting Director</td>
<td>Mpumalanga Sub-regional Office</td>
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<td>Taletso TVET College</td>
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<tr>
<td>Mr Phineas Nkau</td>
<td>Vocational Programmes Manager</td>
<td>Orbit TVET College</td>
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<td>Ms Annamarie Pitts</td>
<td>Programme Manager</td>
<td>Vuselela TVET College</td>
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<tr>
<td>Mr Mxolisi Biya</td>
<td>E-learning Co-ordinator</td>
<td>Nkangala TVET College</td>
</tr>
<tr>
<td>Mr Vuyani Khoza</td>
<td>IT Officer</td>
<td>Ehlanzeni TVET College</td>
</tr>
<tr>
<td>Mr Hentie Goosen</td>
<td>Programme Manager</td>
<td>Vuselela TVET College</td>
</tr>
<tr>
<td>Mr Robert Mojafi</td>
<td>Deputy Principal Academics</td>
<td>Taletso TVET College</td>
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<tr>
<td>Ms Thato Ramaphakela</td>
<td>Assistant Director Innovation and Partnership</td>
<td>Nkangala TVET College</td>
</tr>
<tr>
<td>Mr W Mogau</td>
<td>Programme Manager</td>
<td>Taletso TVET College</td>
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<tr>
<td>Mr L Lethlake</td>
<td>MIS Manager</td>
<td>Taletso TVET College</td>
</tr>
<tr>
<td>Mr Johan Steyn</td>
<td>Network Administrator</td>
<td>Esayidi TVET College</td>
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In addition, the Chief Director for Open Learning, Ms Trudi van Wyk and her team (Mr Randal Faulmann and Ms Gerda Venter) also made contributions to the development of this guideline. The guideline includes original contributions from BLTT members as well as information based on desktop and academic research.
1.3 SCOPE

This guideline can be used by all stakeholders in the TVET sector including management, staff, and college council members. Due to the constant developments in technology, this guideline will be amended on a regular basis. Input from users, to further strengthen this guideline, will be highly appreciated and can be directed to Dr Balkrishen on Balkrishen.p@dhet.gov.za. The guideline is not intended to provide an exhaustive discourse on all available strategies but to serve as a foundational document upon which remote and blended learning strategies for colleges can be developed. See ANNEXURE B for an Example of an institutional Open Learning Policy.

1.4 GLOSSARY

**Blended learning** – refers to learning design at the institution that strategically, systematically and effectively integrates a range of face-to-face, online, mobile, open, social and other technology-enhanced learning across physical and virtual environments, as informed and driven by student needs and support for desired learning activities and learning outcomes.

**Remote learning** – is a subset of Blended learning and refers to colleges enabling students to participate actively in learning when not at the institution. Although COVID-19 has necessitated remote learning, in many instances, this strategy can also be successfully employed post-COVID-19.

**e-Learning** – means learning utilising electronic technologies to access educational curriculum outside of a traditional classroom (Jabar Al-Atabi & Al-Noori, 2020).

**Open learning** – is “an approach which combines the principles of learner-centeredness, lifelong learning, flexibility of learning provision, the removal of barriers to access learning, the recognition for credit of prior learning experience, the provision of learner support, the construction of learning programmes in the expectation that learners can succeed, and the maintenance of rigorous quality assurance over the design of learning materials and support systems” (DHET, 2017a).
**Digital literacy** – refers to the ability to locate, evaluate, choose, use and create technologies effectively, critically and safely for lifelong learning. Students require digital literacy to locate, engage, interact, create, share and communicate with a range of learning technologies in order to access subject information, participate in learning activities, collaborate with peers and complete assessment tasks. Staff require digital literacy to communicate, support, motivate and inspire learning for students in contemporary learning environments.

**Mode of delivery** – refers to whether a subject is delivered to students via full contact, partial contact or no contact. Blended learning can, and should be integrated into any subject regardless of mode of delivery.

### 1.5 ABBREVIATIONS

- **4IR** Fourth Industrial Revolution
- **ADDG** Acting Deputy Director-General
- **ADSL** Asymmetric Digital Subscriber Line
- **AP** Access Points
- **API** Application Programming Interface
- **AST** Academic Support Technologies
- **BLTT** Blended Learning Task Team
- **BoM** Bill of Materials
- **CAPEX** Capital Expenditure
- **CCTV** Closed-Circuit Television
- **CFO** Chief Financial Officer
- **CMS** Content Management System
- **COVID-19** Corona Virus of 2019
- **CRM** Customer Relationship Management
- **CSIR** Council for Scientific and Industrial Research
- **DDR** Double Data Rate
- **DNA** Digital Network Architecture
- **EXCO** Executive Committee
- **FTP** File Transfer Protocol
- **GB** Gigabyte
- **GPU** Graphics Processing Unit
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>HDD</td>
<td>Hard Disk Drive</td>
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<tr>
<td>HDMI</td>
<td>High-Definition Multimedia Interface</td>
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<td>HR</td>
<td>Human Recourses</td>
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<td>ICASS</td>
<td>Internal Continuous Assessment</td>
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<td>ICDL</td>
<td>International Computer Driving Licence</td>
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<td>ICT</td>
<td>Information Communication Technology</td>
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<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
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<td>IoT</td>
<td>Internet of Things</td>
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<td>ISAT</td>
<td>Integrated Summative Assessment Task</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>LAN</td>
<td>Local Area Network</td>
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<td>LMS</td>
<td>Learning Management System</td>
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<td>LTI</td>
<td>Linear Time Invariant</td>
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<td>MS</td>
<td>Microsoft</td>
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<td>NC(V)</td>
<td>National Certificate (Vocational)</td>
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<td>NOLS</td>
<td>National Open Learning System</td>
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<td>NSF</td>
<td>National Skills Fund</td>
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<td>NSFAS</td>
<td>National Student Financial Aid Scheme</td>
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<td>NW &amp; MP</td>
<td>North-West and Mpumalanga</td>
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<td>OER</td>
<td>Open Education Resources</td>
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<td>OPEX</td>
<td>Operational Expenditure</td>
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<td>PAT</td>
<td>Practical Assessment Task</td>
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<td>PC</td>
<td>Personal Computer</td>
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<tr>
<td>PESTEL</td>
<td>Political, Economic, Social, Technological, Environmental and Legal</td>
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<td>PoE</td>
<td>Power over Ethernet</td>
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<td>PoP</td>
<td>Point of Presence</td>
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<td>POP3</td>
<td>Post Office Protocol v3</td>
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<td>PSET</td>
<td>Post-School Education and Training</td>
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<td>REN</td>
<td>Research and Education Network</td>
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<td>RFQ</td>
<td>Request for Quotation</td>
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<td>SaaS</td>
<td>Software as a Service</td>
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<td>SABEN</td>
<td>South African Broadband Education Networks</td>
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<td>SANReN</td>
<td>South African National Research Network</td>
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<td>SCA</td>
<td>SANReN Competency Area</td>
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<td>SCM</td>
<td>Supply Chain Management</td>
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<td>SCORM</td>
<td>Sharable Content Object Reference Model</td>
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1.6 OPEN LEARNING PRINCIPLES

Remote and Blended learning in this guideline are based on the following principles:

- All students must be involved. The diversity of our students, their learning preferences, individual preparedness and life circumstances that may impact student engagement with learning, will inform the design and choice of blended learning and flexible delivery approaches. To ensure that students are provided with consistent and easy access to services, information, tools and resources necessary to facilitate and enable effective student learning and engagement.

- All colleges must participate. To utilise approaches that enable and encourage interaction, collaboration and communication between staff, campuses and colleges so as to foster a community spirit within the realm of Blended Learning across the TVET sector and beyond.

- Implement open learning principles to enhance student centred remote learning strategies that might increase student success. Students are inspired, motivated and engaged to learn through remote and blended
learning approaches that vary according to their appropriateness to the particular learning context. To include opportunities for the development of digital literacy among students through orientation to virtual environments used for learning, teaching and within discipline-specific contexts over the course of their studies.

- Staff are to be encouraged and supported to adopt fit-for-purpose and innovative remote and blended learning approaches. These approaches will be enabled by efficient resource and capacity building. Digital literacy is recognised as an essential skill for academic staff at colleges.

- Flexible delivery and assessment options are offered to cater for student needs, to meet intended learning outcomes and to optimise the limited resources at colleges.

- Blended learning and flexible delivery are chosen to enhance student engagement and learning outcomes and not merely for the reduction of teaching delivery costs or teaching workload. In some circumstances, blended learning and flexible delivery may require increased investment of resources to ensure sustainable delivery of high-quality learning and teaching, and these costs are required upfront, prior to the implementation process.

- Technology is considered an opportunity to enhance the overall student experience at TVET colleges. This may include relevant data, capturing patterns of student participation (learning analytics) to inform the monitoring of students at risk, and to provide timeous learner support and information.

1.7 GRATITUDE

The DHET would like to thank all contributors to this draft document and would like to extend appreciation for their commitment to serve the greater good of the TVET sector. The DHET further encourages input from all users for the enhancement and strengthening of this guideline.
CHAPTER 2: CAMPUS CONNECTIVITY

2.1 INTRODUCTION

The purpose of this ICT preparation plan is to assist colleges within the Higher Education and Training space in terms of network planning, current status of connectivity and recommended services and solutions to have in place within each TVET college campus. This needs to be done in order to future proof the relevance of TVET colleges in the higher education sector.

Historically, the majority of TVET colleges have had challenges with connectivity, either with their Local Area Network (LAN) or in terms of internet connectivity and communication between campuses belonging to the same college. The purpose of this guideline is to equip, uplift and promote technology within the TVET sector to align ourselves to the 4th Industrial Revolution. Currently a gap exists within our sector. It is our responsibility to make sure we are not left behind – this would be detrimental to our students – who are our number one priority – and those who are working as teachers, lecturers and educational developers within our sector need to be encouraged and motivated by having systems in place which promote Higher Education and Training.

Policies pertaining to online assessment and specified inclusions to ‘controlled environments’ need to be made. It is inefficient to offer 'Online learning' when assessments and testing remain limited to physical venues. In order to continually function as a viable institution for tertiary education, the TVET sector needs to undertake curriculum changes and content digitisation to suit the online modality and criteria.

2.2 PROCESS FLOW

It is important to briefly outline the change management necessary to prepare TVET colleges for online learning. These changes should include improvements to the overall college ICT environment, the upgrading of physical computer laboratory space and preparation for remote learning i.e., e-Learning, blended learning and distance learning. All improvements should be made for
the purpose of promoting more effective and efficient interactive online education.

In order to progress it is vital to understand the current infrastructure of each campus. Without this information future planning is undermined.

Below are steps which need to be taken in order to ascertain the level of connectivity at each campus. This pertains to both the LAN and internet connectivity as a whole.

See each campus as a separate project which will be completed in phases:

- **Phase 1**: Current status
- **Phase 2**: Assessment of the entire campus’ ICT and network infrastructure
- **Phase 3**: Finalise Bill of Materials in order to send out an RFQ (Request for Quotation) to follow the procurement process of the college SCM department with approval from Senior Management and in consultation with the IT Manager/Senior Technical Manager of the college.
- **Phase 4**: Implementation of hardware and installation of all cabling, switches, routing and configurations to be made in accordance with requirement as per specification from finalised assessment. In addition, current Internet Service Providers will need to be consulted due to IP ranges. Routing protocols between hardware and physical points will need to be configured.

Attention should be given to the following steps in terms of addressing ICT related challenges per campus:

- Technical, in-depth assessment of each campus’ current ICT infrastructure and network layout.
- Site mapping, planning and optimal cable routing and Access Point placement will need to be done as part of the project plan for that campus.
- Wi-Fi on campuses for students and admin staff will also be part of the planning.
- A bill of materials (BoM) will then need to be drafted according to the needs of the campus – that can be generated from the information of the assessment of that particular site.
Once all the necessary information has been gathered the Request for Quotation (RFQ) process within the Colleges’ SCM department will need to be followed in order to procure the needed equipment.

Colleges who do not have the in-house expertise, should consult with a network designer for assistance.

Finally, the implementation phase of the network reconfiguration and installation per campus will need to be done.

The “TVET Colleges Connection Project (TCCP)” is an ICT infrastructure initiative by the Department of Higher Education and Training (DHET) funded through a grant from the National Skills Fund (NSF) to connect Technical and Vocational Education and Training (TVET) college campuses to the South African National Research Network (SANReN). The purpose of this project is to solve bandwidth deficiency at South Africa’s TVET colleges by connecting them to SANReN, thereby enabling them to contribute to meeting the goals of the developmental state.

The DHET has appointed the South African Broadband Education Networks (SABEN) to implement the project. SABEN is a non-profit company that was formed as a collaboration between the Tertiary Education and Research Network of South Africa (TENET) and SANReN, at the Council for Scientific and Industrial Research (CSIR), specifically to connect TVET colleges to SANReN. Initially, SABEN assisted colleges to self-fund their connections to SANReN.

SANReN consists of the following infrastructure:

- A core national dark fibre backbone with several managed bandwidth backbone links at 100 Gbps;
- Backbone extensions (regional links) – typically at 10 Gbps;
- Back-hauling from the submarine cable landing stations at Yzerfontein and Mtunzini;
- Capacity on five undersea cables, and
- Several metropolitan area networks.

The map on page 13 indicates the terrestrial and undersea capacity of SANReN (Hay, 2020).
2.3 NORMS AND STANDARDS

The following are norms and standards around procuring a self-connect to SANReN as well as internet and data networking services delivered over SANReN from SABEN.

Any TVET college that is able to demonstrate that it qualifies to join the SANReN network will, on application, and on signature of the SABEN REN (Research and Education Network) Service Agreement, be connected by, and receive services from SABEN.

An eligible TVET college must also make provisions to acquire a high-capacity (last-mile) access network connecting its campuses to one or more SANReN points of presence (PoPs), such as a nearby public University campus or statutory research centre. Examples of high-capacity last-mile access connections include the use of optical fibre networks (where available) or licenced wireless radio access networks. A connection to a SANReN PoP can either be programmed through the Meraka Institute or procured through SABEN as a self-funded connection (self-connect).
The following is a list of norms and standards for procuring a self-connect:

2.3.1 **Determine Eligibility**
Public colleges, as well as private colleges that are recognised by SARS as exempt from income taxes, are eligible to connect to SANReN.

2.3.2 **Submit an Application for all sites/campuses**
An application for each site or campus must be submitted through the convenient online form.

2.3.3 **Execute SABEN REN Services Agreement**
The REN Services Agreement is a master agreement that outlines the terms of getting connectivity through SABEN. The REN services agreement does not contain any orders or financial commitments on college’s part, including the specifics around individual circuits, costs, bandwidth, services, etc. The latter are handled as individual orders that become a party in this REN agreement. The agreement is available online, as are the Standard Terms and Conditions, Acceptable Use Policy and the Service Level Indicators and Targets.

2.3.4 **Site Survey Forms**
To get a cost estimate for procuring a last-mail access circuit(s), a college will need to complete the site survey permission forms for the contractor to conduct site visits. These will be sent to the contractor and they will be in touch to schedule site visits.

2.3.5 **Collaborative Review of Project**
The project is studied by a TENET/SCA review team in terms of its impact on the SANReN backbone, the affected SANReN PoP(s) and the SANReN community.

2.3.6 **Presentation to EXCO**
Presentation to colleges’ EXCO and other managers (including Principal, CFO, Corp Services, Academic Services, SCM, IT) is recommended. This is to ensure that the project is reviewed and included within the organisation’s strategic and budgeting processes.
2.3.7 **Project Service Schedule**

Once the final costs are completed, an official cost proposal will be submitted in the form of a SABEN Service Schedule (a de-facto quote), which becomes a party to the REN Services Agreement. The Project Service Schedule outlines the CAPEX costs and OPEX costs associated with the access network (not the bandwidth costs).

2.3.8 **Purchase Order**

Once the principal signs the SABEN Service Schedule, the college will send a purchase order to the vendor which gives them the go-ahead to commence the builds.

2.3.9 **Network Deployment and Service Commissioning**

Once the builds are complete, SABEN will commission the physical links, and deploy the necessary networking equipment. (Note, if a college uses an Order Number system for procurement purposes, such a number – for the project CAPEX and for the network OPEX – would need to be in place by the time the build is complete, after which invoicing will follow.)

2.3.10 **Bandwidth Order**

Around the time the project is commissioned, the college will be able to issue a SABEN Bandwidth Order. Once the bandwidth order is received, the service goes live.

2.4 **INTERNAL SYSTEMS AT CAMPUSES**

2.4.1 **Campus LAN and Wireless LAN**

As users of campus connectivity depend on the network to access the most important information that they need to do their jobs and to transport their voice or video with reliability, the network must be able to provide resilient, intelligent transport. The reliable network design also needs to incorporate versatility in order to address the changing needs of an organisation.
Here are some key concepts that should be addressed before connecting to a reliable and versatile network design. On campus the network should be:

- Ready to appropriately scale over time in order to meet the demands of the organisation it is supporting.
- Because demands on wireless access points (APs) with the latest standards, including Wi-Fi 6 (802.11ax) technology exceed 1 Gbps, and the IEEE has ratified the 802.3bz standard that defines 2.5 Gbps and 5 Gbps Ethernet, a network that is ready to support the demand without requiring an upgrade of the existing copper Ethernet wiring plant, should be deployed. These latest demands can be accommodated by deploying network platforms, e.g. Cisco® Catalyst Multigigabit technology.
- As new devices with higher power requirements, such as lighting, surveillance cameras, virtual desktop terminals, remote access switches, and Aps are deployed, the design should have the ability to support power over Ethernet up to 90 W per port, offered with Cisco Universal Power Over Ethernet Plus, and the access layer should also provide PoE perpetual power during switch upgrade and reboot events. The Cisco Catalyst 9000 Series access layer switches are perpetual PoE-capable and ready for 100 W per port, as that technology becomes available.
- Compliance issues drive the choice of platforms with regard to standards certifications and MACsec. Analytic data should be made available, using technologies such as NetFlow.
- The Internet of Things (IoT) impacts today's network design. The college network should support TrustSec and other segmentation and virtualisation technologies, such as Cisco Software-Defined Access (SD-Access) in order to enable the scale and expanded uses and policies for the network driven by these trends.
- Bandwidth needs are doubling potentially multiple times over the lifetime of a network so that the network deployed today needs to be prepared to aggregate using 10 Gbps Ethernet to 25 Gbps to 40 Gbps to 100 Gbps capacities or more over time.
• The network platforms deployed today should offer the best longevity into the future, versus selecting the equipment that only meets the limits of today’s needs.

• To reduce operational complexity, a centralised controller can be used, with open APIs, allowing for very fast, lower-risk deployment of network devices and services through UI and existing orchestration systems – Cisco Digital Network Architecture Center (Cisco DNA Center) automates this network device configuration and management to achieve a college’s intent.

2.4.2 Data Centre and Server Room

Every college needs a Client-Server Network for greater security of the network, more control e.g. network traffic passing through the network, being able to see what each computer is doing and limiting certain actions and preventing things such as viruses spreading, also the amount of data storage available to each computer on the network – usually in a Client-Server Network, the server can provide much more storage space than most external storage devices that could be attached to a peer-peer network.

Every college is therefore required to invest in its own infrastructure, hardware and maintenance solutions, with all the equipment accommodated in a dedicated room of the office. However, thanks to the cloud technology and the rapidly increasing availability of fibre connectivity, other options like data centres have opened up in recent years.

The following are components that are needed in a Data Centre or Server Room:

• Buildings/Premises of Server Room;
• Power Supply in Server Room;
• Server Room Raised Floor System;
• Protect Server Room from Heat, Fire, Flame;
• Prevent Server Room from Water;
• Protection Against Burglaries;
• Video Surveillance;
• Access Authorisation Concept;
• Documentation and Control; and
• Server Room Key Management.
2.5 ENSURING OF PROPER TRAINING

Keeping up with the pace of technological advancement is a challenge for companies of all shapes and sizes. While technology creates powerful business opportunities, it also creates skills gaps, particularly in the educational space where the demand for skilled workers is especially high.

In fact, to emerge stronger from the COVID-19 crisis, institutions should start reskilling their workforces now on new technologies that have emerged like MS Teams, Zoom, Learning Management Systems etc.

Here are a few ways that we use as colleges to ensure proper training:

- Skill audit on technology must be conducted on both staff and students.
- Staff members are able to indicate all skills that need upgrading on the Personal Development Plan.

2.6 UPGRADES AND MAINTENANCE MODEL

A poorly maintained IT infrastructure will stifle productivity and reduce efficiency for a college, but that’s not all. If a college is not paying close attention to the health of its network and all connected devices, it creates exposure to cyber-attacks. That’s why regular auditing and maintenance are essential elements of any IT strategy. Here is a model of infrastructure upgrading and maintenance:

2.6.1 Get Rid of Redundant Applications

Less hardware and software means less stuff to look after, and there’s no reason to have systems bogged down by unnecessary extras. Nonetheless, computers tend to collect a lot of junk software and unneeded files over the years. As such, it is advised that an application portfolio is established and audited regularly. Compared to internal server hosting, consideration should be given to cloud computing. Migration of some of the everyday business applications to the cloud, such as accounting, document editing and customer relationship management, will greatly reduce dependency on in-house resources.
2.6.2 Upgrade or Reinstall The Operating System

Extended support for Windows 7 has been discontinued, therefore colleges should upgrade to Windows 10 which is inherently more secure due to the fact that all security-related updates are installed automatically.

Upgrading operating systems is necessary to get rid of all redundant files and applications thereby improving performance and reducing the amount of wasted disk space.

2.6.3 Clean The Hardware

Maintaining IT infrastructure isn’t just about upgrading and replacing hardware and software. It’s also about keeping everything clean. Computers and other devices collect a great deal of dust, which can clog up cooling fans and even increase the risk of a short circuit damaging the hardware. Dirty computers also run hotter and louder, thereby reducing efficiency and increasing operational costs.

Blasting dust out with cans of compressed air is the best way of cleaning the inside components of a computer. This should be done at least every six months.

2.6.4 Carry Out a Security and Network Audit

Regular and thorough audits of networks are needed to help IT administrators keep track of all hardware, while also helping to expose any potentially vulnerable endpoints.

When auditing a network, start by creating a complete catalogue/inventory of all connected hardware, operating systems, firmware and installed applications. At the same time, define all information-handling processes and user access rights to all resources within the college.

2.6.5 Review User Accounts and Access Rights

Regularly reviewing user accounts and access rights is critical for the safety of data, and it’s something that needs to be done every time a
security audit is carried out. This process involves determining who has access to which company data, which devices they use, and how they access college resources.

At the very least, colleges need to enforce multi-factor authentication for any systems and applications that handle sensitive data, particularly on smartphones and other portable devices. Forced password change should be included in the IT policy and implemented strictly.

CHAPTER 3: STUDENT AND STAFF CONNECTIVITY

3.1 INTRODUCTION
This chapter offers guidelines about factors to consider in planning, building, and managing student and staff on-site connectivity and data for off-site usage. Accelerated digital transformation, network traffic shifts and economic disruption in the wake of the COVID-19 pandemic have combined to alter the landscape of the enterprise networking industry (Doyle, 2018).

3.2 ON-SITE CONNECTIVITY
Network infrastructure comprises hardware and software, systems and devices, and it enables computing and communication between users, services, applications and processes. Anything involved in the network, from servers to wireless routers, comes together to make up a system’s network infrastructure. Network infrastructure allows for effective communication and service between users, applications, services, devices and so forth. For reliable connectivity, the following must be considered at campuses:

3.2.1 Reliable connectivity
• All colleges need to invest in a Category 6 (CAT6) Local Network Infrastructure cabling for fast and reliable on-site connectivity.
• Campus Wi-Fi must be made available and accessible to all students.
• Implementing a secured high-speed WAN to link all college sites;
• Implementing electronic access control to computer labs;
• Provision of network printers to all sites of the college based on needs assessment; and
• Development of student-centric portals and mobile apps.
3.2.2 Security

• Rollout of domains at campuses and ensure all users are trained. Active Directory helps to organise a company’s users, computers and more. The IT admin uses AD to organise the company’s complete hierarchy, from which computers belong on which network, to which users have access to the storage room.
• CCTV rollout to all facilities of the college.
• Implementing electronic access control to every facility of the college together with time and attendance system.
• ICT infrastructure assessment and cyber security risk assessment due to age of software and lack of patching process for older software available on older computers for the college.

3.2.3 Email and calendar

In order for students and staff to access their emails onsite at each campus the IT unit must create a Microsoft Exchange solution which is Microsoft's email server solution. In layman's terms, it's a piece of software that runs on a server and manages all your emails. Incoming, outgoing, saved, drafts, calendars – everything is done through Microsoft Exchange and stored on the server. Microsoft Exchange isn't the only way a company can manage their emails. Most organisations start with what's called POP3 email, meaning that whoever hosts the website also host email accounts. They collect it and then send it to each individual computer, effectively downloading that email onto each computer.

The problem with POP3, and why products like Microsoft Exchange exist, is that all of the emails that are downloaded from the web-hosting provider are stored on individual computers. Therefore, if one of the individual computers crashes, all emails on that PC would be lost. Microsoft Exchange is designed to centralise an institution’s emails into one database. Instead of a web-hosting company handling the email and them storing it on individual PCs, MS Exchange manages and backs up the emails on a server.
The rise in popularity of ‘hosted exchange’ has allowed organisations to access a variety of enterprise-grade software solutions and bypass the major hurdles of infrastructure costs, licencing fees, maintenance and training. Hosted Microsoft Exchange services, offered by IT service providers, can securely host and store a college’s electronic mail in the cloud. Hosted Microsoft Exchange services, offered by IT service providers, can securely host and store a college’s electronic mail in the cloud.

3.2.4 Communication

- Student centres or libraries at all campuses should provide reliable internet access for all students, for the purpose of project research, online studying and sending or receiving emails.
- Implementation of VoIP telephones across the college.

3.3 OFF-SITE CONNECTIVITY

Off-site connectivity or remote working is becoming popular worldwide, spurred on by the rapid rise of technology and fast internet connections. It also comes in handy during disruptions or national disasters, such as the COVID-19 Pandemic. In order for students and staff to successfully work remotely, they will need the right equipment and technology to operate effectively and efficiently. Here are some guidelines for working remotely:

3.3.1 Reliable connectivity

Having access to resources is very important when working remotely or off-site and therefore stable and secure internet connectivity is essential. Staff and students will need to use their own personal internet connection (ADSL, fibre or mobile data), which can either be at their own cost or can be funded by the college.

Some resources (ITS, VIP, Persal and Bas) will need staff members to connect to the college’s network, the IT unit must make sure that they have created a virtual private network (VPN) in order to have access to these resources.
3.3.2 Security
Before doing any work (either on site or off site), ensure that the antivirus program is updated regularly. A good antivirus program is essential to protect devices and networks from cyber threats.

3.3.3 Email and calendar
Emails and calendars can be accessed via a web browser – using the Outlook Web App or Office 365. When working remotely, it is recommended to share calendars with colleagues. Office 365 is the perfect tool for remote or off-site working. Additionally, the ‘Show As’ option can be set to ‘Working Elsewhere’.

3.3.4 Learning
For remote learning or off-site learning, you will need a learning management system (LMS), which is an online software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs.

3.3.5 Printing
Documents received on a cell phone can be printed via a mobile printing app designed for this purpose, e.g. PaperCut’s Mobility Printing App. It allows printing to any printer installed on the mobile.

3.3.6 File storage
Organisations are now responding to making their IT systems external, meaning that they are increasingly turning and moving away from the traditional way of doing things to the now so called ‘Cloud-Based Services’. This shift has meant that there is a greater need for direct internet access and a reduction in data centre investments. At the same time, the rapid shift to work at home has reshaped traffic patterns away from the campus and the branch toward home internet services. So what exactly is ‘Cloud-Based Services’? In a nutshell, cloud services are IT resources that are provided over the internet. Such services can come via public clouds, private clouds, and hybrid clouds, which is a combination of public and private clouds. (Microsoft) Vendors are
responsible for providing 100 percent uptime for these cloud-based services so their customers can access and consume it any time.

If an institution uses cloud storage, such as OneDrive or Google Drive, these files can be easily accessed via a web browser, while documents can be signed electronically.

3.3.7 Communication
One of the conditions of working remotely or off site is that you need to be contactable during the hours that you’re working. Skype for Business, Zoom or Microsoft Teams are ideal for group discussions or meetings. It can be used on a laptop or desktop with video or voice conferencing, instant group chats, or even screen-sharing with colleagues.

It also allows forwarding incoming calls to a mobile device or can be set to ring on both computer/handset and an alternative number, such as a mobile device.

3.3.8 Schedule meetings and online classes using Microsoft Teams
Microsoft Teams provides the perfect collaboration and teaching solution while working remotely. The key benefit of Microsoft Teams is that it can be used to schedule online meetings and conduct online classes.

3.3.9 Off-site or remote software
Microsoft Office 365 provides access to Word, Excel and other Office products. Google’s G Suite for Education – includes a wide range of similar applications. If you manage a departmental website or a blog, you don’t need to be on campus to update the site – simply log on via your web browser. Microsoft Educational software licences also entitle educators to install applications such as EndNote, Nvivo, SPSS and Statistica. For more specialised software, Remote Desktop Connection can be used to access software without installation.
CHAPTER 4: DEVICES FOR LECTURERS AND STUDENTS

4.1 INTRODUCTION
The selection of devices for lecturers or students will primarily be determined by the available budget, however this chapter intends to guide an IT manager through the process of making recommendations and draw a specification document for procurement.

4.2 CONSIDERATION POINTS FOR LECTURER LAPTOPS
- Colleges must procure laptops with funding allocated specifically for this purpose.
- The college shall provide IT support to the lecturers whenever it is necessary.
- A lecturer must ensure the maximum protection, proper storage and care of the laptop at all times.
- Laptop must be able to connect to the college network in order to access specific college systems relevant to the lecturer’s work.
- The laptop must also be able to access college Wi-Fi in order to access websites that are relevant to the lecturer’s work.
- All the lecturers employed at a college shall have access to a laptop for work purposes – blended learning.

4.3 SPECIFICATIONS
Minimum specifications that should be considered are tabled below.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>STUDENTS</th>
<th>LECTURERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Processor</td>
<td>Core i3 or i5</td>
<td>Core i5 or i7 GPU (graphic processing unit)</td>
</tr>
<tr>
<td>2. RAM</td>
<td>4 GB DDR3</td>
<td>8 GB DDR4</td>
</tr>
<tr>
<td>3. HDD/SSD</td>
<td>SSD/HDD 720 pa + 30 fps</td>
<td>HDD 1080P @ 30 fps</td>
</tr>
<tr>
<td>4. Built-in devices</td>
<td>Webcam/audio USB ports on computer</td>
<td>External webcam/audio USB hub HDMI SD card slot</td>
</tr>
<tr>
<td>5. Operating System</td>
<td>Windows 10</td>
<td>Windows 10 Pro</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>6. Internet</td>
<td>Ethernet cable or Router (20 mbps)</td>
<td>Ethernet cable or Router (20 mbps)</td>
</tr>
<tr>
<td>7. Battery life</td>
<td>8 or more hours</td>
<td>8 or more hours</td>
</tr>
<tr>
<td>8. Screen</td>
<td>13,3”</td>
<td>Interactive touch screen 15,6”</td>
</tr>
<tr>
<td>9. Accessories</td>
<td>Carry Bag Headset</td>
<td>Stylus Pen (fine point) Digital Lock cable Carry Bag HDMI to VGA adaptor USB type C to Gigabit LAN adaptor</td>
</tr>
</tbody>
</table>

The question could arise why interactive touchscreen devices are recommended for lecturers. Traditionally institutions installed expensive interactive whiteboards with specialised software in classrooms. Should an institution invest in buying touchscreen laptops for lecturers, it’s as good as placing the interactive whiteboard in their hands. Whereas the whiteboard is fixed in a particular room and lesson preparation needs to be done in the classroom, the laptop with the interactive software, e.g. Open board – that can be downloaded from the internet for free – enables a lecturer to prepare lessons remotely on the device. These lessons can be exported to .mp4 files and uploaded on the institution’s LMS for students to access online. In addition, classrooms could be furnished with wireless data projectors and docking stations to reduce set-up time.

See ANNEXURE A for the DHET policy for educators’ laptops.
CHAPTER 5: LEARNING MANAGEMENT SYSTEM (LMS)

5.1 INTRODUCTION
Human beings keep on improving themselves in various aspects of life. Education plays a pivotal role in improving conditions of living. The interaction amongst people of various cultures across countries and continents also supports improvement through borrowing, assimilation and adaptation of ideas. The Learning Management System is an educational tool that enhances education. TVET colleges are key institutions that skill people in order to improve conditions of their lives. It is imperative that they assimilate the LMS tool to improve their efficacy.

5.2 DEFINITION
“A learning management system (LMS) is a software that is designed specifically to create, distribute, and manage the delivery of educational content. The LMS can be hosted as a stand-alone product on the company server, or it can be a cloud-based platform that is hosted by the software firm” (Valamis, 2020).

5.3 REQUIREMENTS FOR SUCCESSFUL IMPLEMENTATION
The choice of an LMS is one of the first and most important choices a college has to make when venturing into a blended/remote learning mode of delivery. The following requirements need to be kept in mind:

- **Integration**: must be integrated with the current TVET college system (Student administration, assessment, registration, social media platforms).
- **Content management**: easy to add, remove, edit content and enable the college to customise it to the needs of the college.
- **Support for mobile learning**: compatible to be used by different forms of devices, e.g. cell phones, tablets, iPads, smart phones, laptops, personal computers.
- **Security**: each candidate must have a unique identifier for individual credentials to track usage/non-usage.
- **Customisation and branding**: must allow for individual college branding to customise their logos, colours and mottos for ease of identification by lecturers and students.
• **Help Desk**: a full staff complement is needed to support its implementation (Administration Officers, Accounting Officers, IT Personnel, Academic Officials, Senior Management).

• **e-Commerce**: real-time reporting and updating with current happenings in and around the globe for ease of reference.

• **Tracking and reporting**: must be able to track how students and lecturers utilise the system and its content. Reports should contain data on user progression, survey responses, exam results and training histories.

• **Assessment and feedback**: online assessments as well as online submission and marking of assignments that is easily accessible through smart phones, laptops and tablets.

• **Broadcasting capabilities**: should integrate with online video conferencing platforms such as MS Teams, Zoom and Google Meet which will allow the lecturer to present lessons directly from their laptop or interactive whiteboard.

• Allow lecturers to **add videos, images, formative assessments and game-based activities** to their lessons beforehand or easily insert or create them during the lesson.

• Lessons to be **pre-recorded and uploaded** to the system.

• **Live Streaming** is another option that can be done either through Facebook or the college LMS.

• **Students** must be able to access the system, view it online, ask questions and make their own notes.
5.4 CHOOSING AN LMS

5.4.1 Some examples of available LMS platforms are:

- Moodle
- Blackboard
- Canvas
- Brightspace
- Schoology
- Mindflash
- RockStar
- TalentLMS

The two main categories whereby LMSs are classified are Proprietary (paid) and Open Source (free). This is however only true with regard to money itself, since Open Source also comes with a price, i.e. time and effort. The following table describes it best (Cujba, 2020):

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>PROPRIETARY</th>
<th>OPEN SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licence Fee</td>
<td>Cost-based</td>
<td>No cost</td>
</tr>
<tr>
<td>Time &amp; Effort Needed For Implementation</td>
<td>Fairly easy (included in licence fee)</td>
<td>Can require advanced technical skills and great costs</td>
</tr>
<tr>
<td>Client Support &amp; Maintenance Services</td>
<td>Included in licence agreement</td>
<td>Requires additional costs for a dedicated team or third-party support provider</td>
</tr>
<tr>
<td>Ease Of Customisation</td>
<td>Performed by vendor’s developers only</td>
<td>All projects may be implemented as much as the LMS architecture allows</td>
</tr>
</tbody>
</table>

5.4.2 Criteria

When choosing an LMS the following criteria must be taken into consideration (Cujba, 2020):

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| 1. Administration | • Content management system  
|                        | • Notifications  
|                        | • SSO  
|                        | • SCORM, LTI, API  
|                        | • CRM |
According to Mansfield (2019), the most popular platforms used by higher education institutions are:

- **BLACKBOARD**
  It has led the premium LMS pack for a number of years now and you certainly get what you pay for. Fully functional, the vendor offers both a 'software as a service' (SaaS) model and a non-SaaS model. The system integrates with an institution’s student information system (SIS), and has a mobile platform that operates as well as the desktop.
• **SCHOOLEGY**
  Schoology is another full-featured LMS. One area where it really shines, however, is the number of built-in integrations it comes with out of the box. Everything from YouTube to Google Drive and Dropbox, you can use the tools directly within the system. Calling itself “the only LMS that connects your campus” the solution enables students and lecturers to communicate across campus and across the world.

• **BRIGHTSPACE**
  While Brightspace can have a steeper learning curve than the previous two learning management systems, it’s just as functional. One standout feature is Release Conditions. Using these, a lecturer can have content appear to a student only after certain conditions have been met such as turning in the materials from the previous lesson. The real power behind this solution, however, is the fact that the company has been making learning management systems since 1992. They know their stuff and educators respect the insight and functionality the platform provides.

• **MOODLE**
  One of the most popular learning management systems around, Moodle boasts solid functionality. While not as pretty and easy-to-use as its paid competitors, it nonetheless offers everything a higher education institution needs. Moodle’s been around for a while and that brings a couple of benefits to the table. First, there are currently over 1,300 plugins available to extend the functionality of the LMS. Second, if you don’t want to go it alone, Moodle has a worldwide network of partners who are ready to help.

• **SAKAI**
  Another open-source LMS, Sakai is another popular choice among higher educational institutions. Bundled with a number of APIs and community features, you’ll find many of the features found in the premium options here.
5.5 MOODLE AS LMS PLATFORM

- **Moodle** is the world’s most popular learning management system, used by countless schools, universities, not-for-profit organisations and companies to respond to their education and training needs.

- The acronym **Moodle** stands for *modular object-orientated dynamic learning environment*. (In the early years the “m” stood for “Martin’s”, named after Martin Dougiamas, the original developer.)

- Moodle can be fully integrated into the College Management Information System.

- Colleges can use Moodle to obtain data from the ITS system, provided that both systems are compatible in terms of the version.

- By implementing Moodle LMS, colleges can quickly unlock the capability to offer a fully integrated and managed learning platform to its students.

- A hosted environment for Moodle LMS can be implemented: the service provider makes a server available to the college with all the necessary software loaded. This includes the Operating System, Database, Open-source Application (Moodle), Network, Firewall and Backup services.

5.6 MOODLE APP FEATURES AND BENEFITS

- **Flexible learning**: students can access materials, submit assignments and quizzes, check deadlines and participate in course activities anywhere on any device.

- **Mobile notifications**: notify students of upcoming deadlines, important announcements or private messages with notifications that pop up on their mobile devices.

- **Offline learning**: students can download materials for offline access, attempt quizzes and activities and submit assignments offline – everything will sync when their devices are back online.

- **In-app communication**: students can send private messages, participate in group chats or in forums wherever they are.

- **Customisation**: Moodle can be customised for the college to ensure:
  - Each user has access to a personalised dashboard.
  - Students and lecturers will be engaged in exciting and interactive course experiences.
  - Built-in support for assignments, forums and quizzes.
Plugin management is available to add features such as e-Commerce, gamification, additional activity types and much more.
The logo of the college can be incorporated.

The costing may include design and implementation of Moodle LMS, once-off loading of content, hosting environment, administrative and technical support and on-site training. It is important to conduct a regular assessment of the functionality of the system, based on the following:

- **Effectiveness of the system**
  The effectiveness of the system can be judged by improved success rate of students. If there is no notable improvement, it would mean that the system must be realigned considering all of its aspects.

- **Usage of the system by lecturers**
  The rate at which lecturers use the system may determine the success rate. It is recommended that a module must be built-in the system to monitor lecturer usage of the system. Minimal usage may suggest lack of knowledge of how to use it which may necessitate further capacity development.

- **Usage of the system by students**
  The rate at which students use the system may also determine their success. The module suggested above must also apply to students so that the college has knowledge regarding the frequency of use of the system by students.
CHAPTER 6: TRAINING OF LECTURERS AND STUDENTS IN DIGITAL TEACHING AND LEARNING

6.1 INTRODUCTION
Investing in technology alone without building capacity of the human capital to use the system is a futile exercise. Lecturers must know how to use the system otherwise the investment becomes a fruitless exercise. Students must also be familiar with digital learning so that they gain maximum benefit. Therefore, it is important to train both lecturers and students.

6.2 LECTURER TRAINING
When planning for blended learning, the planning team should look at the specific training programmes for both staff and students. The training manuals and user guides should be developed to meet the needs, skills and the knowledge of the different groups. Staff training needs to be done according to the college’s professional development plan. Attention should be given to how the lecturer will communicate online with the students, taking into account their knowledge, skills and abilities. The lecturers are to be trained on the online technology and the equipment to be used in blended learning. Training should include effective ways of giving online feedback to students. Technology anxiety cannot be underestimated when it comes to teaching and learning.
The following table illustrates the proposed training for the different needs of lecturers:

<table>
<thead>
<tr>
<th>TRAINING NEEDS</th>
<th>PROPOSED GUIDELINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of meeting &amp; collaboration platforms (e.g. ZOOM, MS Teams)</td>
<td>- In-house training from experienced staff;</td>
</tr>
<tr>
<td></td>
<td>- YouTube videos; and</td>
</tr>
<tr>
<td></td>
<td>- Training is part &amp; parcel of Microsoft Teams licence – they offer it to the institution.</td>
</tr>
<tr>
<td>Mindset change management towards 4IR teaching</td>
<td>- Open source; and</td>
</tr>
<tr>
<td></td>
<td>- Mindset change &amp; 4IR teaching course for lecturers (from ViaAfrica).</td>
</tr>
<tr>
<td>Use of technology in the classroom</td>
<td>- ICDL programme: ICT IN EDUCATION;</td>
</tr>
<tr>
<td></td>
<td>- Some publishers have webinars; and</td>
</tr>
<tr>
<td></td>
<td>- Consider costs of each avenue.</td>
</tr>
<tr>
<td>How to use electronic devices for teaching e.g. Visualisers/USB document cameras</td>
<td>- In-house training from experienced staff to reduce costs;</td>
</tr>
<tr>
<td></td>
<td>- Training available from manufacturers of products; and</td>
</tr>
<tr>
<td></td>
<td>- Open-source training material and videos available online.</td>
</tr>
<tr>
<td>Designing and Creating digital content, interactive and engaging courses to promote active, adaptive and resilient learning - including copyright issues</td>
<td>- Open-source training material and videos available online;</td>
</tr>
<tr>
<td></td>
<td>- In-house training from experienced staff;</td>
</tr>
<tr>
<td></td>
<td>- Service provider with specific expertise.</td>
</tr>
<tr>
<td>How to use LMS</td>
<td>- LMS organisations able to deliver training;</td>
</tr>
<tr>
<td></td>
<td>- Must be specific for that LMS;</td>
</tr>
<tr>
<td></td>
<td>- DHET supports Moodle as preferred LMS; and</td>
</tr>
<tr>
<td></td>
<td>- Training available via NOLS.</td>
</tr>
<tr>
<td>Using a digital assessment platform</td>
<td>- Training to be requested from platform developers</td>
</tr>
<tr>
<td>Online teaching pedagogy</td>
<td>- A more formal training programme required from an educational institution, as this relates to teaching methodology; and</td>
</tr>
<tr>
<td></td>
<td>- Included with ICDL module: ICT IN EDUCATION.</td>
</tr>
</tbody>
</table>
6.3 STUDENT TRAINING

Students are to be trained on the technology to be used for the success of the blended learning. When training student’s factors such as student’s background, programme registered for, level and age are to be considered. The training should be tailor made to suit all types of students of the college. The skills level of the students is necessary to be looked at to avoid boring training with no results. Blended learning should not only be about transforming learning and distributing the learning content, but addressing social and emotional needs. It is advisable to add more multi-media, interactivity and technology to make the learning more interesting.

<table>
<thead>
<tr>
<th>TRAINING NEEDS</th>
<th>PROPOSED GUIDELINES</th>
</tr>
</thead>
</table>
| Orientation    | • Inform students about the LMS – Online application (e.g. name);  
                 • Send a link to students maybe via WhatsApp groups; and  
                 • Orientate students on the registration process (as student) and provide their personal details. |
| Preparation    | • Students to make sure they have Smartphones/laptops with internet/data;  
                 • Students to draft their own daily study timetable;  
                 • Students to commit themselves to finish all given assignments before due date;  
                 • Students to download study tips and study habits; and  
                 • Students to take note of all do’s and don’ts upfront. |
| Learning | • Students should login every day and check all communications;  
|          | • Students to download course learning outcomes;  
|          | • Students to follow plans set by lecturers;  
|          | • Students to follow instructions and communicate via WhatsApp if they do not understand;  
|          | • Students should take note of meetings or webinar’s dates and schedules; and  
|          | • Students should write down all posted notes.  
| Assessment | • Students to do all assignments, tests or quizzes as prescribed; and  
|            | • Students should always take note of due dates.  

Lecturers are to be in the forefront in the implementation of blended learning. If not well trained, if not confident they cannot deliver what is expected from them. Training is an investment that will pay off in the long run, hence the college should plan for it to be done accordingly for the return in the investment.
CHAPTER 7: DIGITAL CONTENT

7.1 INTRODUCTION

Digital Content Creation entails the design and creation of digital learning material, including text, images, videos, slides and interactive activities such as quizzes, that constitutes a publication or document or online course for an end-user (students) in specific contexts. Content is “something that is to be expressed through some medium, as speech, writing or any of various arts for self-expression, distribution, marketing and/or publication. Typical forms of content creation include maintaining and updating websites, blogging, photography, videography, online commentary, the maintenance of social media accounts, and editing and distribution of digital media. A Pew survey described content creation as the creation of “the material people contribute to the online world”.

7.2 CONTENT DEVELOPMENT

7.2.1 The Digital Content Design Process:

- Subject Matter Expert (SME) write the content and is paid for this (a policy regarding this aspect must be in place).
- The design team and SME storyboard the learning object.
- The Instructional design team do the actual digital content development.
- SME quality checks the content and quality checks spelling and grammar.
- When producing audio recordings, a neutral accent will ensure that students follow easily.
- Produce the content with the design team ensuring all concepts are covered.
- Quality assures the end-product fit for purpose.
7.2.2 The Team Of Developers Should Consist Of:

- Writers – these are subject matter experts (SMEs) usually lecturers drawn from the colleges that are paid to write content (provide scripts);
- Designers – these are graphic or software designers or animators that have experience in creating graphics and videos;
- Videographer and audio – these are specialists in working with digital content either in video form or to provide audio; and
- Managers – project managers that manage the different projects and liaise with all relevant parties.

7.2.3 Recording Studio

The video recording of lectures or lessons, could be used as an alternative, or in addition to, digitally structured content. The following will be required to set up a recording studio at the college:

- A suitable venue – not too big, e.g. 15 m² with a standard ceiling height of 2.4 m;
- A budget of about R320k for sound proofing/treatment and small building alterations if needed – there should be no windows and only 1 door, plus:
  - 1 x Studio MIC – Shure Condenser;
  - 1 x POP Filter;
  - 1 x Mic stand and arm desk mount;
  - 1 x XTR Sound cable, male to female – 10 m;
  - 1 x Sound Card – M-Audio 192 – 6;
  - 1 x Twin pack studio quality headphones;
  - 1 x Samson headphone AMP;
  - 2 x Extension cables for headphone CZK31;
  - 2 x Adaptors 1 x Custom cable headphone to amp to sound card – 10 m;
  - 1 x Pair of Resolve 8 Monitors (speakers);
  - 1 x Cable from device to headphone AMP – 5 m;
  - 1 x 10 m DHMI MMV2.0 C/877; and
  - 1 x Hybrid Isolation shield for studio desk.
- Huawei IdeaHub Pro 65” All purpose screen with wheel-based bracket;
- Two High-End Computers: One for studio recording and sound manipulation (mixing, sampling and mastering audio files) and
another for video editing and content production, with the following specifications:

- 2 x Intel core i7 – 10th Generation CPU;
- 2 x Compatible high-end motherboard – Recommended: ASUS ROG STRIX B460-G;
- 2 x 650-watt Power Supply – Recommended: Corsair CX Series CX650M;
- 2 x 16 GB DDR4 RAM – Recommended: KLEVV BOLT X 16 GB, 3200 MHz DDR4;
- 2 x M.2 Drive – 1 TB (super-fast hard drive) – Recommended: KLEVV CRAS C720 1TB M.2 PCIe 3x4 NVMe;
- 1 x Graphics Card – Recommended: MSI GeForce RTX 2060 VENTUS GP OC 6 GB GDDR6 Graphics Card (as it is not needed in the recording studio computer, but only for the video editing one);
- 2 x 4TB SATA Internal Hard Disk Drive (bulk storage of video content) Recommended: WD Blue 4 TB Desktop;
- 2 x Computer case – Recommended: CORSAIR 110R Tempered Glass Gaming Case;
- 2 x Good quality keyboard and mouse combo (USB Type) – Recommended: ASUS Cerberus Gaming Keyboard and Mouse Combo;
- 2 x 24” LED Monitors (3 in total). 1 will be used in the recording studio, and 2 will be connected to the video editing computer which will be in a venue close to the recording studio but not inside it, so that editing can continue when more recordings are happening in the recording studio – Recommended: DELL S2421HGF 24” 144 Hz Gaming Monitor; and
- 2 x 4TB External Hard Drives for transferring any media to and from the two computers – Recommended: Seagate Basic 4TB Portable USB 3.0 External Hard Drive.

- Video Camera:
  - 1 x Canon Legria HF-G 60 Video camera;
  - 1 x 256 GB Class 10 Memory card for super-fast reading and writing of data; and
  - 1 x Tripod for the camera.

- Dark carpet for the room;

- Good lighting for the recording studio environment; and

- Annual licence for Adobe Audition – Sound recording and manipulation software.
7.3 OTHER SOURCES OF DIGITAL CONTENT

7.3.1 National Open Learning System (NOLS)

The National Open Learning Systems are divided into two, e.g. LMS content repository and the Learner Record Management System. All content is open so the PSET sector can download and make the necessary changes to accommodate their needs. The content repository consists of thousands of videos and content that the PSET sector can make use of to build their own online courses.

Amongst others, the following resources are available on the NOLS and will grow significantly in the near future – All content is free:

- Open Education Resources;
- Student Support Career Practices;
- Curriculum Documents – previous question papers and full videos;
- College’s contribution – different programmes – quality assured;
- Introductory Moodle course; and
- Remote teaching course.

The following steps are to be followed in order to enrol for a course on NOLS:

- Then go to sign-up/register;
- Insert details up to the last step, step 5;
- Go to DHET Services;
- Go to the NOLS Website;
- Accept Terms & Conditions; and
- Scroll down to all courses and self-enrol in the desired course.

7.3.2 Other content sources:

- Hundreds of Open Education Resources (OER) are available on the web, however not well aligned with SA’s TVET curricula. One of the most popular ones is Khan Academy at [https://www.khanacademy.org/](https://www.khanacademy.org/).
- Some vendors offer fully functional LMS services with fully developed digital content and online tutor support, e.g. Student Hub. It does however come at a price. Read more at [https://www.thestudenthub.co.za/](https://www.thestudenthub.co.za/).
7.3.3 Publishers:

(a) Future Managers at https://distance.futuremanagers.com/ have study guides for distance learning that provide the following:
- Information on how to work through prescribed reading;
- Additional notes per topic on specific content;
- E-links to video clips, animations and additional information online;
- Competence challenge checklists;
- Answers to calculation questions;
- Exemplar examination papers with fully worked answers; and
- The lecturer/tutor pack including hardcopy textbook, e-Book, hardcopy study guide and memory stick with PowerPoint slides, examination papers, year planner template and softcopy lecturer guide.

(b) Pearson at https://mlm.pearson.com/global/index.html offer the Mylab & Mastering systems that can be integrated and used with other LMSs. From a single course section to delivery across an entire institution, they offer the integration, support, and training needed. Furthermore they offer mobile learning solutions with Pearson e-Text, Vitalsource and Redshelf e-Text.

(c) Some vendors specialise only in one or two subject fields, e.g. AST Tutor (http://www.learnsupport.co.za/) that has digital content on a Moodle-based platform only for fundamental subjects. This can also be integrated with a college’s own LMS. Others that focus only on mathematics are AskArchie (https://askarchie.co.za/) and Geogebra (https://www.geogebra.org/materials)

7.3.4 Sharing, storage and archiving of curriculum information

Traditionally, educators created learning content and the institution managed curation and long-term storage. Ownership was relatively clear: content developed by academic staff often belonged to the institution, as stipulated in staff contracts.

Institutions should have policies that set out how to manage, archive, store and access teaching and learning content.
Using external web-based technologies and services means that lecturers, students and external peers or mentors can create, share and assess online content without the need for institutional authentication.

This kind of approach can support open access to learning activities and content, which defies traditional boundaries with regard to the time that classes take place and who can contribute.

NOLS is a national platform for all college-related repositories and could be utilised inter-changeably with the college’s LMS that is the ideal space of sharing and archiving curriculum documents, institutional programmes, OER, research documents and historical examination papers. Institutions could share digital content on NOLS by uploading it on a monthly basis.

7.4 INTERNAL QUALITY ASSURANCE OF DIGITAL CONTENT

7.4.1 Policy for quality assurance of digital content

Institutions should have a policy in place that includes the quality assurance of digital content. The following elements should be included:

- Course structure and development;
- Teaching and learning – methodology and pedagogy;
- Student assessment (learner authentication, work authorship and examination security) and certification;
- Electronic security measures; and
- Relevance and standards.

7.4.2 Points for consideration:

- The institution may also define policies to grant proper access and ensure participation for those students affected by disability, illness, and other mitigating circumstances.
- Institutions should have processes for the design and approval of their programmes. The programmes should be designed so that they meet the objectives set for them, including the intended learning outcomes.
• Authors of learning materials are relevant for the subject. Learning materials are reviewed and updated periodically.

• The technical infrastructure is aligned with the teaching methodology, learning activities, and e-Assessment methods, and it eases the teaching and learning process.

• e-Assessment methods are fit for purpose, allowing students to demonstrate the extent to which the intended learning outcomes have been achieved.

• Students are clearly informed about the e-Assessment.

• Students are aware of plagiarism rules.

• Students are trained in how to appropriately paraphrase, cite, and reference, regarding both online and print sources.

• The institution gives advice on appropriate online behaviour (netiquette rules).

7.4.3 Content quality assurance tool:

The following table serves as example of a quality assurance checklist for digital content development inside a college’s LMS. A good practice is to let program co-ordinators or education specialists do quality checks on online course material before it is made available to students on the LMS.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>✓</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section 1: General Course Information</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructions on how to get started and where to find various course components are clear and easy to find.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>The course schedule (year plan) with topic &amp; cycle dates are clear.</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Contact sessions (if relevant) and activity or assignment/assessment schedule with due dates is posted and indicated on calendar.</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Section 2: Course Goals, Resources and Learning Outcomes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The course learning outcomes are described in terms of what the student will be able to do upon completion.</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>The module/topic learning outcomes (SOs &amp; LOs) are clearly stated and are consistent with the course level outcomes.</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Instructions to student on how to find learning material and resources are clearly stated.</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Learning material are appropriately distributed and aligned among modules/topics.</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>The flow of the lessons is easy to follow for students.</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>The lecturer’s notes are original, not copied and pasted from a textbook (That would be plagiarism).</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>The course material consist of a variety of interactive lesson tools.</td>
<td>Yes</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Where e-Learning takes place, the quality assurance system ensures that the collection of data respects the privacy rights of students, and it considers intellectual property issues. The institution considers ethical norms and government policy with respect to data protection and the privacy of students.

CHAPTER 8: DIGITAL ASSESSMENT

8.1 INTRODUCTION

According to Gartner (2016), “digital assessment refers to the application of digital technologies to create, administer, report and manage tests and examinations”. It has become eminent that higher education institutions aspire to bridge the gap between ‘digital’ at work and on campus, and online assessments are an important step in that direction. Well managed digital assessment systems could cut down on paper leaking opportunities and have the potential to reduce lecturers’ work load by taking care of the marking of certain question types.

8.2 CONSIDERATION POINTS

World-wide there are great concern over digital assessment malpractices. Credibility and authenticity of assessments and students should be considered carefully when choosing systems. High levels of built-in security is non-negotiable. Colleges should however caution that the software doesn’t dictate the process. The nature and requirements of the particular prescribed assessment types, e.g. assignments, tests, ISATs, PATs, etc., will determine whether it is suitable for digital or online mode, and this will differ from subject to subject. Online assessment will furthermore be determined by the ICASS Policy of DHET. The NC(V) ICASS guidelines of 2021 make provision for online assessments – under controlled conditions – but none for Nated/ Report 191.
8.3 E-AUTHENTICATION INSTRUMENTS

Different instruments are available for checking different aspects of online assessments:

- To check authorship and similarity through anti-plagiarism software, e.g. Turnitin – used very successfully by most universities.
- To authenticate identity through knowledge, biometrics (biological & behavioural), possession and mechanisms.

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"e-Authentication instruments framework for online assessment (Okada et al., 2019)"

8.4 DIFFERENT MODELS AVAILABLE

8.4.1 Model 1

Assessment Authoring and Moderation Module, e.g. AssetOnline comes with high security and encryption. Read more at https://assetonline.co.za/.
8.4.2 Model 2
E-marking platform, e.g. RM-assessor can be used to mark both long and short answer responses, and also offers auto-marking of multiple-choice questions. The platform can accommodate unstructured papers, and allows annotation of both static and dynamic responses. Read more at https://ib.assessor.rm.com/.

8.4.3 Model 3
Online assessment and auto-marking of certain question types can be done inside an LMS such as Moodle or Sakai. This is used successfully by some TVET colleges. Moodle version 3.9 and above has a comprehensive set of question types and there are numerous plugins that make more question types available. One can even test method in Maths by using a plugin like Moodle Stack. Read more about Stack at https://moodle.org/plugins/qtype_stack.

8.4.4 Model 4
A fully fletched assessment platform, e.g. Inspera Assessment (https://www.inspera.com/) that allows:
- Planning and scheduling of assessments;
- Designing exam paper, authoring and banking items, enabling aids and accessing arrangements;
- Delivering online and offline tests and monitoring (proctoring) test-takers during the exam. Read more about proctored online exams at https://examonline.in/how-do-online-proctored-exams-work/;
- Marking and producing feedback; and
- Sharing results and feedback.
The digital assessment’s advantages is the reason why every college should consider blended learning. It saves time, feedback can be received instantly and the fact that it is environmentally friendly – no papers used. Students and lecturers can track their progress easily and interventions can be implemented earlier. Digital assessments has benefits to the lecturer who do not have to take assessments home for marking, allowing him/her to work on preparing lessons that can be more interactive and enjoyable by both him/her and the students.

CHAPTER 9: COLLEGE WEBSITE

9.1 INTRODUCTION

The college website is not a blended learning tool per se, except that it hosts space for the LMS, the online registration and student support guidelines. The website isn’t used for teaching as such – it is a marketing and communication tool, therefore it should also host links to the social media accounts of the college, e.g. Facebook, Twitter and the college’s YouTube channel.

It is best to have a self-manageable site like WordPress or Drupal, and capacitate an employee to manage it so there is no dependency on a service provider to do the daily tasks like posting vacancies and RFQs.

For purposes of control, it is advisable that the owner of the web domain is the college itself and not the service provider. Colleges should furthermore select carefully when it comes to the domain name. Higher education institutions should choose between .ac.za (where .ac refers to academic – mostly universities) and .edu.za (where .edu refers to educational – mostly colleges).

So-called zero-rated sites for colleges is still a big issue – it only happened in level 5 of lockdown. Mobile networks are unwilling to meet colleges’ needs. At best they have a reverse billing option whereby colleges pay up to an agreed amount. Colleges have to negotiate with every individual network.

With the building of a website there are two main issues – **price** and **time**. These two values depend largely on the size and scope of the project. To outline the whole development process, a website development timeline should be developed, adding tasks, and establishing milestones for the project. It is the best way to track the project implementation to make sure
9.2 DEVELOPMENT PHASES

9.2.1 Step 1. Gathering information: Purpose, main goals, and target audience

The college website is normally the responsibility of the IT unit and the Communication and Marketing units. When developing a website, both the IT unit and the Communications and Marketing units should be involved in the first stage, the stage of discovering and researching. This stage determines how the subsequent steps will look like. The most important task at this point is to get a clear understanding of the future website purposes, the main goals, and the target audience, which in this case is students and all stakeholders. A website development questionnaire can be used to develop the best strategy for further project management.

Different types of websites provide visitors with different functionality, which means that different technologies should be used according to purposes. A well-described and detailed plan based on this pre-development data can prevent spending extra resources on solving unexpected issues such as design changing or adding the functionality that wasn’t initially planned.

Estimated time: from 1 to 2 weeks
9.2.2 Step 2. Planning: Sitemap and wireframe creation

At this stage of the website development cycle, the IT unit of the college (Developer) should create the data that allows a customer to judge how the entire site will look like. If the college does not have a Developer, then this stage can be outsourced. Based on the information that was gathered in the previous phase, the sitemap is created.

The sitemap should describe the relations between the main areas of the website. Such representation could help understand how usable the final product will be. It can show the relationship between the different pages of a website, so one can judge how easy it will be for the end-user to find the required information or service if he starts from the main page. The main reason behind the sitemap creation is to build a user-friendly and easy-to-navigate website.
The site map illustrates the inner structure of a website but doesn’t describe the user interface. Sometimes, before coding can start, there’s a necessity to get approval from the management of the college. In that case, a wireframe or “mock-up” can be created, e.g.

The other important thing is to select technology stack – programming language, frameworks, CMS (Content Management System) that will be used.

*Estimated time: from 2 to 6 weeks*

**9.2.3 Step 3. Design: Page layouts, review, and approval cycle**

The website takes shape during the design phase. All the visual content, such as images, photos, and videos is created at this step. Once again, all the info that was gathered through the first phase is
The college and target audience must be kept in mind while you work on a design.

The website layout is the result of a designer’s work. It can be a graphic sketch or an actual graphic design. The primary function of the layout is to represent the information structure, visualise the content, and demonstrate the basic functionality. Layouts contain colours, logos, images and can give a general understanding of the future product.

Once completed the college management can review the layout and give feedback. If the College Management does not approve of some aspects of the design, changes should be made and sent back. This cycle should be repeated until everyone is completely satisfied.

Estimated time: from 4 to 12 weeks

9.2.4 Step 4. Content writing and assembly

This step relies heavily on the involvement of the Marketing and Communication unit. Content writing and compiling usually overlaps with other stages of website creation, and its role can’t be underestimated. At this step, it is necessary to put in writing the very essence you’d like to communicate to the audience of the website and add calls-to-action. Content writing also involves the creation of catching headlines, text editing, writing new text, compiling the existing text, etc., which takes time and effort. As a rule, the client undertakes to provide website content ready to migrate to the site. It is better when all website content is provided before or during website coding.

Estimated time: from 5 to 15 weeks

9.2.5 Step 5. Coding

At this step, the IT unit or credible service provider can finally start creating the website itself. Graphic elements that have been designed during the previous stages should be used to create an actual website. Usually, the home page is created first, and then all sub-pages are added, according to the website hierarchy that was previously created in the form of a sitemap. Frameworks and CMS
should be implemented to make sure that the server can handle the installation and set-up smoothly.

All static web page elements that were designed during the mock-up and layout creation should be created and tested. Then, special features and interactivity should be added. A deep understanding of every website development technology that will be used is crucial at this phase.

If CMS is used for site creation, CMS plugins can also be installed. The other important step is SEO (Search Engine Optimisation). SEO is the optimisation of website elements (e.g., title, description, key word) that can help the site achieve higher rankings in the search engines. And, once again, valid code is quite important for SEO.

*Estimated time: from 6 to 15 weeks*

### 9.2.6 Step 6. Testing, review and launch

Testing is probably the most routine part of a process. Every single link should be tested to make sure that there are no broken links among them. One should check every form, every script, run a spell-checking software to find possible typos. Use code validators to check if all codes follow the current web standards. Valid code is necessary, for example, cross-browser compatibility is important.

After checking and re-checking the website, it’s time to upload it to a server. An FTP (File Transfer Protocol) software is used for that purpose. After the files have been deployed another final test should be run to be sure that all files have been installed correctly.

*Estimated time: from 2 to 4 weeks*
9.2.7 Step 7. Maintenance: Opinion monitoring and regular updating

What’s important to remember is that a website is more of a service than a product. It’s not enough to “deliver” a website to a user. Care should be taken that everything works fine, and everybody is satisfied.

The feedback system added to the site will allow detection of possible problems that end-users might face. The highest priority task, in this case, is to fix the problem as quickly as possible.

The other important thing is keeping the website up-to-date. Regular updates will protect the site from bugs and decrease security risks.

Estimated time: ongoing

CHAPTER 10: COPYRIGHT ISSUES

10.1 INTRODUCTION

Copyright is a legal aspect with which entities must comply. Creating technology-based blended learning falls within the parameters of section 2(1) (a–g) of the Copyright Act (Government, 1978). Colleges must therefore under no circumstances infringe the Act as it can be costly and at the same time protect their novel ideas from being stolen.

10.2 ICT WITHIN THE COPYRIGHT SPACE

Ubiquitous and ever-opening access to information world-wide creates a need for skilled workers who can transform information into meaningful, new knowledge that benefits society. In this context TVET colleges and students stand to gain with in the teaching and learning space when using the blended teaching and learning mode. The potential of ICT to tackle key socio-economic challenges, and thereby impact on development, has led many countries to invest heavily in it. This puts ICT at the centre of their development strategies, particularly in higher education (Butcher, 2010, p. 9). This is specifically true for Technical and Vocational Education and Training (TVET) colleges.
The growth of knowledge societies has placed increasing emphasis on the requirement to ensure that managers, lecturers and students are information literate, and therefore education systems are faced with a need to provide formal instruction in information, visual, and technological literacy, as well as on how to create meaningful content with today’s tools. Critically, ICT is valuable as a means to achieve genuine knowledge societies. Thus, TVET colleges are also faced with a need to provide formal instruction in information, visual, and technological literacy, as well as on how to create meaningful content with today’s tools. Central to this, is a good understanding of Copyright, Intellectual Property and Open Educational Resources and related concepts such as related rights, fair use, and ownership to name a few.

10.3 RESPONSIBILITIES RELATING TO COPYRIGHT

It is the obligation of DHET to:

- **Participate** actively in the development of the Amended Copyright Act process and encourage all its subsidiary entities to do the same;
- Adopt and publish a relevant **open licence** for the Post-School Education and Training (PSET) system;
- Explicitly announce the **policy position** with regard to Copyright of educational materials;
- Provide a **directive** on the development of materials for TVET college lecturers;
- Develop short **self-directed learning opportunities** for TVET college management and lecturers in:
  - broader Copyright and related issues, as well as the implication for TVET college lecturers; and
  - development and use of Open Educational Resources;
- Provide a **repository/shared space** (currently the National Open Learning System [NOLS]) for lecturers to contribute to the pool of knowledge in TVET colleges.
It is the obligation of TVET colleges to:

- Develop a **community of practice** (expert group) to expand knowledge and expertise on Copyright and related topics and make recommendations to the Department on Copyright and related issues;
- Capacitate lecturers in Copyright and related issues in the development and use of Open Educational Resources; and
- Adopt open licencing as a principle in all works developed in colleges.
- Institute a Copyright environment so that they do not use the college’s novel creation unlawfully.

As a legal matter, Copyright is very important. Failure to comply may be costly. Colleges must protect their respective work and at the same time make sure that they do not abuse other entities’ creative work. Staff members and students must have the same understanding of Copyright and make sure that they protect the college. Colleges must have relevant policies in place meant to deal with any misuse of college copyright properties. At the same time no staff member or student must maliciously expose the college to litigation due to their negligence in the use of other entities’ copyright properties.

**CHAPTER 11: MEASURING IMPACT**

**11.1 INTRODUCTION**

Blended learning combines traditional learning and other learning methods with technology. It has a number of advantages, such as increased participation in different platforms, it also gives learners options of referencing from videos, audios, to face-to-face learning amongst others. It also simplifies assessments for both learners and teachers; online assignments can be submitted easily.

When measuring impact, consideration of all factors relating to traditional and technological learning is crucial. Measuring the real impact of performance has always been a challenging activity in every organisation, the same applies to blended learning. Impact will be measured using the Kirkpatrick’s model of evaluation (Kurt, 2018).
11.2 LEVELS OF MEASURINGIMPACT

11.2.1 Level 1: Reaction

The reaction to the learning from the college community, both lecturers and students. Incorporating technology in classrooms is not a new concept, yet South African institutions of learning relied on traditional methods of learning. Resistance to migration of traditional learning to e-Learning is expected, by both lecturing staff and students. It might provide excitement to some people who are open to the introduction of the new concept and implementation.

Capacity building will be necessary to create ease to both students and lecturing staff. The impact of introduction of e-Learning will be measured by the number of students willing to learn on the platform.

11.2.2 Level 2: Learning

The learning environment and the learning process will change. Adjustment will be required in terms of how teaching and learning is conducted. The positive change that will take place is that if blended learning is implemented, every learner will have access to the same learning material, whether they are in class or not. There should be controlled systems that are aligned to student attendance policy (mainly by NSFAS).

The impact of learning can be measured on giving more activities to complete on their own after every learning objective, to measure participation and competence.

This could be in a form of short survey, activities/classwork/exercise in the classroom, increased level of participation or the level of competency.

11.2.3 Level 3: Behaviour

The implementation of blended learning might have a negative effect both lecturers' and students' willingness to work in groups and assist others. The use of technology discourages physical interaction, and
with that people are drawn to other things rather than interaction and forming relations. There should be promotion of group learning, even if students are not psychically interacting with each other. The use of platforms like WhatsApp groups can yield more positive results. In terms of lecturing staff, communities of practice must be developed to promote interaction on various platforms, and to share best practices.

This could be measured through group learning activities. Students should be assigned activities that require them to work in teams, and at their discretion use platforms suitable for them. The most popular platform used for interactions in group activities should be observed.

11.2.4 Level 4: Results

Results must be analysed and quantified according to the learning preference method used by students. A survey can be conducted on lecturing staff to determine their teaching experience on the various methods used. The learning objectives and targets if met, must be checked which amongst the various methods chosen by students produced more competent students. Data to be compiled and presented on pass rates, attendance, responsiveness, new skills acquired and engagement level.

11.3 ELEMENTS TO BE MEASURED IN BLENDED LEARNING

Colleges can develop blended learning methods that will help minimise the number of students in classrooms and on-campus activities. The focus must be on feeding students with the same amount of information using various platforms where they can access that information. The following elements are to serve as a guide:

11.3.1 Learning objectives

The question to be answered is whether through blended learning, we can achieve the intended objectives that were meant to be achieved. Objectives to be achieved should be specific, measurable and attainable. Operational and performance objectives should be clearly defined. The objectives should be more on to the skills acquired and the performance achieved, and should be a balance between the two.
There should be a way to measure “the what” was achieved. The greatest advantage of blended learning is that different learning objectives can be achieved/or addressed using different tailor-made strategies and tactics by the lecturer.

When measuring impact questions such as: Is the learning method assisting the desired outcome to be achieved? Can they finish the syllabus, do students understand? Are students able to use the technology intended for blended learning? Are students coping with the different methods used? When and how can we say we achieved our objectives, and what was to be achieved – learning has taken place, students attended and enjoyed the lessons and performance is evident through results and desired behaviour.

11.3.2 The learning process

Blended learning also supports a flexible learning environment, diversity of learning styles, learning competence, and learning skills (Huang, Zhou, & Wang, 2006). The learning should be designed in such a way that the different methods are well integrated to achieve the desired outcome. Being able to utilise the devices and face-to-face at the same time will increase the engagement levels, efficiency and productivity, if not it will frustrate all involved. The preparedness of the teachers to offer the lessons has a major influence on the success of the delivery, especially if the teachers are not confident about the delivery technologically, and able to integrate the conventional and online delivery. To implement effectively, teachers are to accept and support the positive effects to the learners. It is therefore necessary that the role of the lecturer and the teaching timetable be re-defined. Colleges should implement a new structure of operations at every level (especially at the start of the implementation stage) to ensure that online/remote/blended learning does not just ‘fit in’ to the existing system but actually redefines it.

Assessment methods are to help the lecturer to assess if learning did take place or required learning took place. Summative – tests and quizzes and formative assessment – assignments and role play can be used. Reflection of the lesson at the end of the lesson is another way.
The assessments should assist to know if knowledge was acquired, skills developed and desired performance was attained. Was the subject target pass rate met? Are assessments structured in such a way that students can access and be assessed easily without difficulty? Are assessments readily available during assessment times? Can students receive their feedback easily? Are assessments related to the learning objectives?

11.3.3 Technology, devices, and other electronic systems

The technology acceptance by both teachers and learners is to be considered. The amount of technology involved will determine how much can be integrated into the blended learning. The type of technology to be used should be planned for before, to ensure that the correct resources and equipment is procured.

The amount of technology needed will influence the number of resources that will be needed to support the learning. Devices that will be adaptable to the learning content will be required. Any other accessories that will add value such as data or WiFi should be in place, if not it will affect the outcome. When measuring the impact of blended learning, the type of technology, whether user friendly to lecturers and students will be considered as well as whether they were delivered on time or not.

11.3.4 Training and related costs

When students are well trained for learning through the different blended learning methods it does not only save costs but also make references available for students later. Online interactive learning classes can take place virtually using appropriate online applications while there is attendance in classrooms. This gives an opportunity for students to travel less but still connect to classrooms and participate in the lessons. Online recorded lessons will not only assist students who missed physical lessons, but will also assist with revision during assessment periods. The videos can be posted immediately after class for students to access. Traditional distance learning remains a good
example as the University of South Africa learning model, has been successful for years. TVET colleges can use the model to cater for learners that can learn from home.

In measuring the impact of blended learning, the related costs for the learning to take place remains an important task. The cost drivers will include labour, content development, the acquisition of related technology for blended learning to take place, student support services. Compared to traditional learning, blended learning remains expensive but cost effective as the benefits are immense.

11.3.5 The learning contents

There should be a balance between the learning content and the technology to be used. The learning content should be designed and developed to meet the requirements, and should be user friendly. How readily available for the students and lecturers is a factor to be considered. Whichever blended learning method the college decides to choose, the advantage is that the lecturer still has the opportunity to choose a digital learning method that will suit the content, the learning ability of the students and the objectives to be achieved.

For blended learning to be a success, it is necessary that institutional support and content design be highly considered due to the technology involved. The content should be designed in such a way that it is flexible for different lecturers and students, and different learning environments, be it at home or at the college. Some important questions to consider are whether the content allows sufficient learner participation; and whether it allows the lecturer to confidently and comfortably engage learners in the teaching process.
CHAPTER 12: CONCLUDING REMARKS AND RECOMMENDATIONS

12.1 CONCLUSION

Access and success are amongst the key performance indicators for the Department of Higher Education and Training. The Department achieves these through its subsidiary entities (TVET colleges). It is for this reason that colleges must plan and invest in broad technology in which remote teaching and learning reside.

The Department of Higher Education and Training is creating a suitable environment for colleges to perform on the indicators mentioned above bearing in mind the use of technology. The TVET Colleges Connection Project (TCCP) referred to in Chapter 2 is one area where the Department is demonstrating its commitment to support colleges. This project addresses the imbalances of the past and enforces equality amongst colleges.

*This document is a guide meant to assist colleges to either start or strengthen their use of technology to enhance the quality of teaching and learning. COVID-19 has made it more urgent that each college either starts or enhances the implementation of remote teaching and learning to guard against loosing time which translates into curricular notional time.*

Proper and suitable equipment/gadgets are required to complement the connectivity that the Department is providing to colleges. This document dedicates a chapter on suggested specification for lecturers’ and students’ gadgets. It is disadvantageous to use a gadget that does not complement the system in terms of speed, and software capacity. Colleges must also develop policies relating to the use of data on and off site by both lecturers and students. It is also necessary for colleges to have a viable maintenance plan for both hardware and software. The system must not collapse due to lack of maintenance or cyber-attack. Strong firewalls and backup systems must be in place.

Colleges must have a good understanding of the copyright law. Workshops are to be provided to lecturers and students about the content of the copyright law. Knowledge of copyright law helps guard against possible unintended
infringements that may be costly for the colleges. Furthermore, colleges must have watertight policies to curb against possible abuse of resources.

Investing in technology must run parallel with investment in the human capital. A lack of concurrent investment will result in the availability of a system that lecturers cannot use which may result in fruitless expenditure.

When investing in blended learning the following principles must be taken into consideration:

- **Durability**: The system must stand the test of time. Colleges must invest in a system that will remain relevant for a long time. It must be easy to upgrade as and when needed due to curricular changes and advancement.

- **Reliability**: The system must be reliable. Its down time must be limited as education is an essential service. Reliability of the system also includes people who maintain it. They must be available every time they are required.

- **Result oriented**: It must promote both student access and success. Once the system is fully operational its usefulness must be measured by the college’s success rate.

It is true that colleges’ infrastructure is limited. Colleges cannot absorb all students who want to be accommodated. The use of remote learning can improve access because many more students may be admitted and learn from home and also be assessed remotely.

### 12.2 RECOMMENDATIONS

Strategic Plans of colleges have a section on PESTEL analysis. When perusing this section from all colleges, there is an indication that the use of technology in all our colleges is long overdue. COVID-19 has taught us that we must always be ready for any eventuality. At the moment, the use of technology is a panacea to a various challenge. On the basis of discussions in all chapters of this document, it is recommended that:

- Colleges embrace this guide and use it to start or strengthen their ICT based teaching and learning which gives impetus to the use of a specific LMS model;
• Colleges that do not have an ICT section to oversee the use of technology, must plan and establish this section;

• College Councils must allocate a budget for the development of technology which acts as a medium for the establishment of blended teaching and learning;

• All colleges should build-in a students’ and lecturers' system-accessing tracking technique and purposeful engagement which may be used in lieu of class attendance registers;

• Student Support Services need to design academic support programmes and align them with blended learning;

• DHET must come up with a standard content quality assurance policy which will ensure that content development is in par with Umalusi’s quality standards;

• DHET should clearly define “online assessment under controlled conditions” within the blended learning space as pronounced in the NC(V) Curriculum Instruction of 2021. It is further recommended that the Report 191 Curriculum Instruction should also encapsulate online assessment.

• Guidelines and policies for online assessments should be put in place to allow for remote formative assessments, ensuring validity and credibility through candidate identification, e.g. proctoring, including facial and fingerprint recognition. Furthermore DHET should liaise with Service Providers, e.g. e-Growth, to provide a uniform Platform Approach to online assessments.

• The funding norm should be reviewed to take into account the open learning approach, purchasing of laptops and data requirement for all lecturers and students.

• Zero-rating of college websites and – more importantly – the college’s LMS URL, must be a permanent arrangement.

The genesis of this document is set out in detail in Chapter 1. The document is intended to serve as a guide rather than be instructive. It is understood that colleges are at different stages of development in terms of ICT. It is expected that the usefulness rate of this document to different colleges will not be the
same. The incremental way in which the processes and activities are set out in this document will allow colleges to determine where they are in this long journey of establishing a fully functional and effective blended learning system, and how much further they need to progress to arrive at the desired destination.

It will be a serious indictment against any college that will not make strides in introducing blended learning. The present and the future dictates that the use of technology is no longer a “want” but a “need”. The youth need to access educational opportunities and also to be successful. The intervening economic, social and environmental conditions make it absolutely necessary that all colleges must vigorously engage blended and remote learning.
REFERENCES


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8. Laptop insurance and warranty
9. Laptop Ownership
10. Laptop Technical Support
11. Laptop Funding
12. Damage or loss of a laptop due to negligence
13. Laptop acquisition Agreement form
1. **Purpose of the Policy**
   1.1 To seek to regulate the acquisition of laptops for the lecturers in the PSET colleges for work-related purposes;
   1.2 To seek to emphasise the protection/security and care that must be taken to secure this laptop;
   1.3 To stipulate the appropriate ownership and usage of the laptop; and
   1.4 To provide funding guidelines for the acquisition of laptops.

2. **Eligibility to receive a laptop**
   All the lecturers employed at a college shall have access to a laptop for work-related purposes.

3. **Minimum Laptop Specifications**
   *A college will be further guided by its policies in addressing minimum specifications.*

<table>
<thead>
<tr>
<th>OS supported</th>
<th>• Windows 10 Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>• Intel® Kabylake i5-7200U or an equivalent</td>
</tr>
</tbody>
</table>
| Display            | • 14.0" TN LCD  
                    • 1366 x 768 (16:9)  
                    • Anti-glare |
| Memory             | • DDR3L 8 GB  
                    • SO-DIMM x 2 |
| Storage options    | • 500 GB |
| Connectivity       | • Wi-Fi, 802.11ac 1x1 with BT 4.0(AC3165)  
                    • LTE, 3G, 4G (M.2)  
                    • Internet Data Package (Option ) |
| Camera             | • Front: 1M |
| Battery            | • 37 Wh (2S1P) 5 000 mAh |
| Keyboard           | • Chocolate type or equivalent |
| Adapter            | • 19 V/40 W |
| Speaker & MIC      | • Built-in 2 speakers; 1.1 W x 2; 8 Ω  
                    • 2 x DMIC |
| Ports                      | • 1 x DC-in jack  
  | • 2 x USB 3.0 port (Type A)  
  | • 1 x USB 3.1 port (Type C)  
  | • 1 x HDMI  
  | • 1 x Micro SD Card Reader  
  | • 1 x Audio combo jack  
  | • 1 x RJ45 LAN  
  | • 1 x Micro SIM slot (Optional) |
|---------------------------|--------------------------------------------------|
| Size/Weight               | • 346.96(W) x 236.84(D) x 24.32(H)mm  
  | • 1.83 kg |
| Ruggedness                | • Water resistance 100cc on C cover  
  | • Drop 50 cm |
| Sensor                    | • G-sensor |
| Software                  | • ikES 2.0 Teacher  
  | • Learning suite  
  | • Remote management |
| Customisation             | • Customised Client Logo on Device  
  | • Customised Client Logo in BIOS  
  | • Pre-Load and Activation of OS and Microsoft Office Suites |
| Warrantee                 | • Provision of warrantee for a period of 36 months. |

4. Software on the laptop
   4.1 Originally installed software
   4.2 Microsoft office pre-installed
   4.3 Virus and Spyware protection
   4.4 Additionally authorised software

5. Connectivity
   5.1 Laptop must be able to connect to the college network in order to access specific college systems relevant to the lecturer’s work.
   5.2 The laptop must also be able to access college Wi-Fi in order to access websites that are relevant to the lecturer’s work.
5.3 The laptop must have a built-in/portable data access (e.g. 3G/4G/VPN) facility.

5.4 The college must provide a minimum of 3 GB data per month to the lecturer which could be increased only in special or extraordinary circumstances.

5.5 LTE portable router.

6. **Acceptable laptop usage**
   6.1 A laptop is only used for lecturer job-related work.
   6.2 A lecturer must take good care of the laptop and protect it from being damaged due to negligence.
   6.3 A lecturer must not illegally install and or transmit copyright material.
   6.4 A lecturer must not waste or abuse the college resources by utilising the network and/internet for commercial, political, financial, or any other personal gains.

7. **Protecting, storing and taking care of the laptop**
   7.1 A lecturer must ensure the maximum protection, proper storage and care of the laptop at all times.
   7.2 A college shall develop a standard procedure for the protection, storage and care of the laptop(s).
   7.3 **Schedule A** shall serve as the “minimum” standard procedure for the protection, storage and care of the laptop(s).

8. **Laptop insurance and warranty**
   8.1 A college shall insure the laptop as its asset.
   8.2 A college shall ensure regular maintenance of the laptop to sustain its warranty.

9. **Laptop Ownership**
   The ownership of the laptop will be vested in the college.

10. **Laptop Technical Support**
    The college shall provide the following IT support to the lecturers:
    10.1 Hardware maintenance and repairs;
    10.2 Password reset;
    10.3 User account support;
    10.4 Operating system and software configurations support;
    10.5 Updates and Software installations;
10.6 Laptop inspection;
10.7 Software upgrades; and
10.8 Re-loading software.

11. **Laptop Funding**

11.1 Colleges must procure laptops with funding allocated specifically for this purpose.

11.2 This funding could be allocated from the following options:

11.2.1 Additional funding from the National Treasury in the form of conditional grant or earmarked allocations over the MTEF period;
11.2.2 Redirect unspent funds on goods and services for the acquisition of laptops;
11.2.3 Accumulated Reserves generated from either the state subsidy (approval will be required from the Department) or other sources of funding;
11.2.4 Interest on investment accumulated from state funding (approval will be required from the Department) of other sources of funding;
11.2.5 Funding allocated by the National Skills Fund;
11.2.6 Support Funding allocated by SETA (e.g. MICT);
11.2.7 Funding raised through Public and Private Partnership (ICT service providers in collaboration with network providers);
11.2.8 Lease Agreements with service providers (this will however still require additional funding over the period of the lease); or
11.2.9 A % ring-fenced from the TVET Infrastructure Grant (over MTEF period – this will require National Treasury approval) to fund laptop acquisition for both TVET and CET lecturers.

12. **Damage or loss of a laptop due to negligence**

Loss or damage to laptops shall be dealt with in line with the College Asset Management Policy and Procedures.

13. **Laptop acquisition Agreement form**

Each lecturer must complete and sign the laptop acquisition agreement form (Schedule B) before being provided with a laptop.
Open Learning Policy

Gert Sibande

TVET College
Document Control Sheet

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<td>All Staff</td>
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INTRODUCTION: Overarching Context

The White Paper for Post-School Education and Training published by the Department of Higher Education and Training, January 2014, states:

The DHET will work toward creating a post-school distance education landscape based on open learning principles. This landscape will complement the traditional campus-based provision.

It will consist of a network of education providers supported by learning support centres and/or connectivity for students. Such a network will make available a wide range of learning opportunities to potential students that are closer to their homes and at times appropriate to their contexts. Other advantages include the development and availability of well-researched, high-quality national learning resources (made available as open education resources [OER], collaborative development of learning resources, more efficient use of existing infrastructure, and an increasing emphasis on independent study as preparation for subsequent lifelong learning.

The College Strategic plan for 2014–2019 has the following aims:

1.1 The College’s primary focus is to improve the success rate of students in all programmes.

1.2 The College is committed to increasing access to programmes leading to intermediate and higher level learning; especially in rural areas.

1.3 In order to become an institution of first choice, Gert Sibande TVET College will continue to invest in modern equipment and attractive infrastructure.

1.4 The College will continue in its efforts to optimally use technology to improve the quality of teaching and learning. The College has realised the significant benefit that WBE has on student motivation and student performance.

1.5 The success of the College is ultimately judged by the number of students that are absorbed into the world of work. In order to improve this output, the College will continue to develop strategic partnerships with provincial and local government, local and international training institutions, businesses, industries, SETAs and other relevant stakeholders.

1.6 The College operates in close collaboration and co-ordination with the Department of Higher Education and Training as well as all other higher education institutions such as public and private TVET colleges and Universities.
1.7 The College regards holistic student support services as one of the most important pillars for student success.

1.8 The College will continue to regard its staff as the single most important factor in achieving its objectives and look forward to improving the efficiency and effectiveness of quality education by focusing on upgrading lecturer qualifications.

1.9 The College is committed to education, hence it has adopted key focus areas to accomplish its mandate by:

- Improving the quality of teaching and learning at all sites;
- Increasing the number of students by attracting and retaining as many as possible;
- Planning, restructuring and improving infrastructure at campuses;
- Building effective College governance and management;
- Creating a flexible environment that takes into account both the operational needs of the College and the needs of the employees and employers; and
- Utilising various modes of delivery to provide quality education and training.

Open Learning is contributing, or has the potential to contribute, to all of these aims, but equally, its successful use is dependent on the fulfilment of other College strategies. The rural nature of the feeder communities to the College presents challenges, such as connectivity issues, which hinders the College’s endeavours to achieve its mission.

This Policy explicitly meets the following points addressed in the College’s Strategic Plan for 2014–2019:

**OBJECTIVE** under par 2 bullet 4:

*Increased use of technology to enhance teaching and learning*: The College will continue in its efforts to optimally use technology to improve the quality of teaching and learning. This includes the use of electronic textbooks, on-line programmes, electronic support material, student support portals, and video conferencing.

AND

Is part of the **PRIORITIES** under par 2 bullet 1

(e): *The use of technology for teaching and learning*

AND

Is part of the College’s **VALUES** under par 3 bullet 4

- *Innovation and Technology*
AND

Is part of the adopted KEY FOCUS AREAS under par 4 bullet 6

- Utilising various modes of delivery to provide quality education and training

AND

It addresses STRATEGIC GOALS 1 & 2 under par 7.1

The College will continue to embark on introducing the latest technology in the classroom.

AND

The implementation of innovative teaching and learning methodologies is very important. The open learning unit is committed to implement, train and assist lecturers and students to use educational technologies and computers with AST Tutor and resources uploaded on the GSC4ME and Khuphula portals to improve skills and pass rates.

AND

The College will find “innovative ways in operations and in offering improved curriculum in line with the dictates of the Fourth Industrial Revolution (4IR) … [and strive to] infuse advances in artificial intelligence (AI), robotics, the Internet of Things (IoT), 3D printing, genetic engineering, quantum computing, and other technologies in [our] curriculum.” (Nzimande, 2020)
PURPOSE

The purpose of this Policy is to detail procedures and requirements for crafting, implementing and executing strategies related to the Open Learning functions of Gert Sibande TVET College and the management of resources related to Open Learning.

PRINCIPLES AND OBJECTIVES

Open Learning is not just about online learning platforms – its success depends on the effective interoperation of all systems and resources supporting the lecturer and student, including Coltech, AST Tutor, Google Apps, e-Placement tests, lecturer interactive laptop, visualisers, digital projectors and all educational technology. This has to be achieved in such a way as to provide the lecturer and student with a technologically advanced teaching and learning experience at Gert Sibande TVET College.

The Open Learning Unit at Gert Sibande TVET College will aim:

• To exploit new delivery mechanisms, including networked workspace and computer based training/learning, to the benefit of a wider range of students both on and off campus;
• To investigate and develop more radical forms of registration, programme delivery and open flexible learning to meet the demands of diverse student constituencies;
• To maintain and enhance, as appropriate, the physical and ICT infrastructure to ensure fitness for purpose;
• To retain existing and form new national and international partnerships and/or MOUs with educational institutions, partner organisations, suppliers, publishers and SETAS to support the implementation and expansion of ICT utilisation in the College;
• To follow both robust and flexible Open Learning approach such as to allow it to respond in a timely manner to new opportunities;
• To further develop effective methods of internal communication, collaboration and consultation and to disseminate best practice;
• To ensure that as far as possible, e-Resources for both lecturers and students, are easily accessible from point of need. In addition, it will via the use of managed repositories, ensure that College owned e-Content and e-Resources are readily available for repurposing and reuse by those entitled to do so, and will thus actively support curriculum and academic developments;
• To monitor and evaluate the use of all systems and practices contributing to its students’ and staff’s Open Learning experiences, to ensure that practice, policy and strategy are responsive to lessons learned and agile in respect of new opportunities, and will actively seek to remove barriers that impede or restrict effective Open Learning;
• To ensure staff development with regard to ICT by playing an active role in their skills building where it’s part of the Open Learning context. This is essential if effective working practices and delivery are to be maintained and further enhanced;
• To increase our change capacity and capability through positive leadership and management development; and
• To ensure, assisted by the use of monitoring and a holistic approach to evaluation, that the resources required to support Open Learning, in human, technical and infrastructural aspects, are appropriate to its requirements.

LEGISLATIVE FRAMEWORK AND REFERENCES

• Higher Education Act – (Act 101 of 1997)
• Public Finance Management Act – (Act 1 of 1999)
• The National Student Financial Aid Scheme Act – (Act 56 of 1999)
• National Credit Act – (Act 34 of 2005)
• Education Laws Amendment Act – (Act 31 of 2007)
KEY PERFORMANCE AREAS and STRATEGIC OBJECTIVES:

- Khuphula & GSC4ME (LMS staff & student portals) development and maintenance
- Enhance teaching & learning with technology
- Website & Domain maintenance
- Online material development and Corporate Training
- Effective Management of Open Learning Unit
- Involvement in & Enhancement of ICT in TVET sector

OPEN LEARNING STRATEGY (Refer to table on page 84.)

BACKGROUND

Due to distances between satellite campuses, resulting in ineffective communication and varying levels of assessments, GS College decided to invest in the establishment of an Open Learning Unit to develop and implement a Learning and Content Management System (LMS) with a mobile app for the student portal. Since the entering-student grows up in a digital era, it is of utmost importance that the TVET sector also stays intact with the latest trends and developments in technology and utilise these to enhance teaching and learning optimally.
THE FOLLOWING ROLL-OUT PHASES APPLY:

Phase 1: Needs Analysis
Phase 2: Research & Planning
Phase 3: Present to and get buy-in from Executive
Phase 4: Purchase & Customise
Phase 5: Implementation, Training & Change management
Phase 6: Utilisation and Evaluation

THE FOLLOWING CHALLENGES CAN BE BRIDGED BY EFFECTIVE CHANGE MANAGEMENT:

- Change resistance;
- Low level of lecturers’ computer skills;
- Senior Management does not always embrace and/or utilise and/or understand ICT;
- Identifying at least two champion lecturers to drive ICT in classrooms;
- IT infrastructure & Connectivity; and
- Funding.

FUTURE GOALS

- 100% Wi-Fi connectivity for all lecturers and students – Wi-Fi hotspots on all campuses;
- Online application and registration process for students through ITS – Sakai integration;
- Life skills courses through Open Learning/virtual environment simulations, e.g. Learner & Driver Licences;
- Purchase & utilise Visualisers & USB Cameras with accompanying software to enhance display of documents or practical demonstrations on the whiteboard;
- Purchase & utilise 3D Printers;
- mLearning = Mobile Learning = Use of Smartphones in classrooms;
- Utilise Open Learning to cater for disabled, e.g. Audio software for the Blind;
- Champion at least two lecturers on each campus to drive Open Learning; equip and support them;
- One-button studios for every campus;
- Internet of Things (IoT);
- Robotics; and
- Artificial Intelligence (AI).
# GS COLLEGE’s Open Learning STRATEGY AND IMPLEMENTATION STATUS

<table>
<thead>
<tr>
<th>ICT or Open Learning COMPONENT</th>
<th>DESCRIPTION</th>
<th>ATTRIBUTES</th>
<th>REQUIREMENTS</th>
<th>PHASE</th>
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<tr>
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<td></td>
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</table>
| SAKAI | Open Source Web-Based Learning and Content Management System built on SAKAI | 1. Platform for lecturer collaboration  
2. Standardisation of assessments  
3. Massive pool of electronic resources | • Reliable Server  
• Stable connectivity | 6 | • Customised with support from SAKAI experts |
| Staff Portal: Khuphula | Staff members can access Khuphula via their cell phones, tablets or PCs | 1. Resources:  
• Subject – and Assessment Guidelines;  
• All assignments and assessments are uploaded, quality checked and shared across campuses;  
• Question Banks are built;  
• Previous years’ resources are archived and accessible;  
• All document templates for PoA and PoE including Mark Sheets, Year Plans, analysis grid, pre- and post-moderation, etc. are available.  
2. Schedule: College dates and Assessment Schedules;  
3. Chat room/Discussion Forum: Used to collaborate with colleagues and have memo discussions;  
4. Announcements, e.g. Important Communication from DHET;  
5. Principal’s “Keeping in touch” monthly letter to academic staff;  
6. Quality Management System; and  
7. Sites for collaboration of groups and committees, e.g. Academic Board, HODs, Senior Managers, Council, etc. | • Internet connection  
• Device  
• Data/Wi-Fi | 6 | • Also utilised by Guest users from other colleges offering Primary Agriculture and Hospitality |
| **Student Portal:** GSC4ME | **Resources:**  
1. Previous Question papers and memos;  
2. Educational/Tutorial videos;  
3. Tests and Quizzes; and  
4. E-guides for Online/Distance Learning Modules – HR.  
5. Schedule: Semester/Trimester dates and Student assessment schedules;  
6. Chat room/Discussion Forum: can be used to collaborate or chat about subject related matters;  
7. Announcements: Important communication from Lecturers to students; and  
8. Dropbox: ODL students submit assignments online. |  
| **ACADEMIC and/or STUDENT SUPPORT** |  
| **AST Tutor** | A computer-based training/tuition program for all fundamental subjects  
1. Academic Support through Computer-based training;  
2. Audio-visual CBT;  
3. [https://www.youtube.com/user/ASTutor](https://www.youtube.com/user/ASTutor) is a new YouTube channel with Maths tutorial videos; and  
4. Installed in fundamental classrooms and Student Support Centres to improve fundamental subject results. | Latest updates  
6 |  
| **Khan Academy** | Open source audio-visual tuition material  
Vast range of Maths & Science educational videos  
[https://www.khanacademy.org/](https://www.khanacademy.org/) | none  
6 | Educational use only  
5 |  
| **Automated Electronic Placement Tests** | GSC-developed online tests for prospective students  
Testing Maths, Maths Literacy and English skills of prospective students to determine qualifying level for placement. | Software & server & administrator  
6 | Huge relieve on marking load  
6 |
| Online Registration | Coltech-SAKAI integrated student portal on GSC4ME | • Existing students as well as new students can pre-enrol via online system (GSC4ME) | • PC or Android device • Connectivity | 4 | Worked well with 2019/2020 intake despite few challenges, e.g. students with subjects on different levels |

**LECTURER DEVELOPMENT & RESOURCES**

| Laptop Initiative | GS teaching staff – all teaching staff have interactive laptops. | • Lecturer utilise for lesson preparation and lesson presentations. | Lecturer must replace laptop according to prescribed minimum specifications upon breakage or loss as per contractual agreement. | 6 | Utilised and supported well |

| ICT Skills for Education and/or Teaching with Technology | Computer Literacy Courses on 3 difficulty levels offered by ICDL | • Offered in F2F setup at accredited sites • Automated/manual testing | Annual subscription | 6 | Was rolled out in Oct 2019 |
ABBREVIATIONS AND DEFINITIONS

DHET: Department of Higher Education and Training
TVET: Technical Vocational Education and Training
GSC: Gert Sibande College
LMS: Learning Management System
MoU: Memorandum of Understanding
QMS: Quality Management System
ODL: Open and Distance Learning

POLICY STATEMENT

The College will use Open Learning where appropriate to support the achievement of its goals in providing learner-centred learning experiences that are flexible, responsive and effective and meet the needs of all its students and partners. Open Learning will be used to innovate both learning and its delivery and will be delivered making effective and efficient use of all resources whilst maintaining the quality standards the College is committed to.

Policy aspects pertaining to Open Learning will, where relevant, be embedded in all College policies and procedures to ensure a consistent and corporate approach to associated systems, processes and responsibilities.

What is Open Learning?

As introduced by DoE (1995) and re-iterated in the White Paper for Post-School Education and Training (DHET, 2013) open learning is “… an approach which combines the principles of learner-centeredness, lifelong learning, flexibility of learning provision, the removal of barriers to access learning, the recognition for credit of prior learning experience, the provision of learner support, the construction of learning programmes in the expectation that learners can succeed, and the maintenance of rigorous quality assurance over the design of learning materials and support systems” (DHET, 2013, p. 7).

Open learning is not a synonym for either distance education, ODL, e-Learning, online learning or blended learning, but forms an umbrella term for all of these and refers to any education and training (mode) which follows open learning principles as set out in the Open Learning Policy Framework (DHET, 2017b).
PLANNING AND IMPLEMENTATION OF POLICY

This Policy is a result of the following:

(a) Team work of The Open Learning Manager, Curriculum Manager and Director for Entrepreneurship Centre, as part of the Practical Assessment for Training on SAQA US ID 123391 DEVELOP ETD POLICIES;

(b) Best Practices developed by GSC Open Learning Unit over the period 2008–2015, hence implementation has been part of a developmental process lead by the Open Learning Manager under the supervision of the Deputy Principal for Academic Affairs and the Principal.

RESPONSIBILITIES AND OBLIGATIONS

It is the responsibility of the Open Learning Manager to initiate and facilitate the review process of the Open Learning Policy every year and/or when significant changes in the organisation dictates it.

MONITORING, EVALUATION AND REVIEW DATE

The annual Strategic Planning of the College will inevitably play a role in the daily practice of the Open Learning Unit, which will be closely monitored and evaluated on an annual basis.

This is the THIRD revision.

RELATED POLICIES

- IT Policy;
- Document and Record Management Policy;
- Email, Internet and Computer Usage Policy;
- Technology Purchase Review Process;
- Learning Programme Development Policy; and
- Registration and Accreditation Policy.
REFERENCES


