Ministry of Education and Sports

DRAFT-2

DIGITAL EDUCATION STANDARDS AND GUIDELINES FOR FOR THE EDUCATION AND SPORTS SECTOR

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DEFINITION OF TERMS

Adoption and diffusion of eLearning: The behaviour pattern surrounding thetaking on of thee-Learning culture

Active learning: student centered learning where students are much more actively engaged in their own learning while instructors take a more guiding/facilitation role.

Advanced training: Training for designing online instruction and advanced use of recent tools for e-Learning.

Asynchronous: Any time, any place. Courses can be online, print based, video or CD/DVD delivery. The student does not need to be in the same location as the instructor or fellow classmates or be available for instruction at the same time

Basic training: Training for awareness and basic knowledge on e-Learning and basic use of e-Learning tool and management system

Blended Learning: The combination of face-to-face and online delivery where 30-60% of the course content is electronically delivered. The electronic delivery can be either asynchronous or synchronous. Also sometimes termed as Hybrid Learning.

Content developer: HEI personnel who works on developing content for the e-Learning course.

Copyright: The exclusive right given to the owner of a creation for a specific period. An author's original work is automatically protected once it is fixed in any tangible medium, such as on a paper, video, audio, disk, computer memory, CD ROMs, etc.

Creative Commons (CC) license: Licensing system that allows the creators of e-content the ability to fine-tune their copyright , spelling out the ways in which others may use their works.

eLearning Culture: The adoption of shared and informed best practices, beliefs and attitudes that shape and influence the perceptions and behaviors of the stakeholders/community towards e-Learning

e-Learning: Learning facilitated and supported through the use of information and communications technology. It may involve the use of some, or all, of the following technologies; namely, desktop and laptop computers, software (including assistive software), interactive whiteboards, digital cameras, mobile and wireless tools (including mobile phones), electronic communication tools (including email, discussion boards, chat facilities & video conferencing), Virtual Learning Environments and learning activity management systems.

e-Learning instructor: Lecturer/Instructor/Teacher teaching a specified e-Learning course. e-Learning trainer Personnel who conducts e-Learning training in the HEI. The person may or may

not be an academic staff. Enculturation The gradual acquisition of the characteristics and norm of e-Learning culture of the university community.

Face to Face onsite learning: Learning interaction that occurs when the instructor and the students are in the same location and time.

Flipped Learning: A situation where teaching content is provided/ exposed to the learner on an online basis prior to the class/ lecture so that class/ lecture time is used for higher order thinking activities (instead of the traditional direct instruction).

Gamification: Gamification is the use of game thinking and game mechanics in non-game contexts to engage users in solving problems.

Governance: The process of governing undertaken by an organization which relates to the mechanism, relationship and process between sub-units within the organization through which the collective interest is articulated, roles and responsibilities are defined and established and the differences are mediated. In e-Learning, this include policy to which the practices need to be adhered to and the functional integration between sub-unit so that efficient e-Learning deployment is achieved and capable of meeting all the key performance indicators.

Higher Education Institution(HEI): refers to all public and private universities including polytechnics and community colleges.

HTML: A markup language used for structuring and presenting content for the World Wide Web. It is the acronym of Hypertext Markup Language.

ID model: The model that provides guidelines on how to organize appropriate pedagogical scenarios to achieve instructional goals. Examples of instructional design model are ADDIE, Hannafin and Peck and many others.

In-house development: An approach in e-content development where the HEI develops the e-Learning contents used by its institution. In this approach the HEI must form its own team of professionals to develop the contents.

Instruction: The intended facilitation of learning toward the identified learning goals. The principal components of instruction includes learning objectives, instructional materials which include the opportunity for student practice through interaction, and assessment which confirms that student learning has taken place.

Instructional design: The systematic process of translating general principles of learning and instruction into plans for instructional materials and activities.

Instructional designer: The individual in the e-content development team who is responsible for understanding the curriculum requirements and collaborates with subject matter experts to define suitable learning outcomes to be covered in the e-content.

Interaction: Structured opportunities for the learner to engage with the content by responding to a question or taking an action to solve a problem.

IPR: The rights given to persons over the creations of their minds (e-Learning resources).

Leadership: A process of social influence whereby a person is able to guides, direct and obtain support within a group of people to undertake specific tasks to accomplish common goals. In e-Learning, leadership is the ability to bring the e-Learning unit to execute the plan in order to accomplish the stated mission and vision and meeting the DePAN and PSPTN performance indices.

Learning analytics: The field associated with deciphering trends and patterns from educational big data, or huge sets of student-related data, to further the advancement of a personalized, supportive system of higher education.

Learning Management System (LMS): A software application or Web-based technology used to plan, implement, and assess a specific learning process. Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance.

Online Learning: A situation where 90-100% of the course content is online either through synchronous or asynchronous delivery.

Open educational resources (OER): Teaching and learning materials that are openly available for use by educators and students, without the requirement to pay royalties or license fees.

Pedagogy: Related to the teaching skills and strategies used by the instructors to facilitate learning; it is the tools, activities, strategies, and decisions for a more interactive, engaging, collaborative and motivational learning environment.

Policy: A guide, procedural processes or protocol developed by senior management which is operational in nature to assist the administrative personnel in undertaking the necessary tasks in order to achieve the stipulated outcomes set forth. Some HEIs have the Open distance and the e-Learning policy at the HEI level. These policies are intended to assist the HEIs in the effective implementation of e-Learning.

Quality: It is a perceptual, conditional and subjective attribute, which provides the degree or measure of customer satisfaction. In e-Learning, quality means the degree to which the inherent characteristics of the system and the teaching and learning services being rendered using the system fulfills the stated and implied requirement/standard/need/expectation of the students in producing more engaging learning experience.

Self-directed learning: A process in which individuals take the initiative, with or without the help of others to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies, and evaluate outcomes.

Stakeholder: The stakeholders in an organization are the individuals or group of individuals that have significant contributions and are affected by policies and activities, undertaken by the organization and that they are therefore potential beneficiaries and/or risk bearers to such activities. In e-Learning, the stakeholders are the top Board of directors of the institution, senior management, senate members, lecturers, students and employers.

Synchronous: Same time, any place. Courses are delivered at one scheduled time, but students and instructors may be in different locations.

Vision: It is an inspirational statement of an organization which describes what the organization would like to achieve in the short and long term with respect to its overall goals. The vision is in the form of statement that would provide the framework within which the organizational policies and strategies are formulated. In e-Learning, the vision statement should clearly state the overall goals for which the framework for e-Learning deployment can be formulated and strategized

Web 2.0: Web applications that support user generated content and promote greater interaction and collaboration among Internet users and other users, content providers, and enterprises.

ACRYNOMS

ADDIE   Assessment, Design, Development, Implementation and Evaluation

AR   Augmented Reality

BOYD   Bring Your Own Device

CBOs   Civil Based Organizations

CC   Creative Commons

DESG   Digital Education Standards and Guidelines

EDP   Education Development Partners

ICT   Information Communication Technology

ID   Instructional Design

FBO   Faith Based Organizations

F2F   Face to Face

HEI   Higher Education Institutions

KPI   Key Performance Indicators

LMS   Learning Management System

MDA   Ministries and Department Agencies

MoES   Ministry of Education and Sports

MOOC   Massive Open Online Course

NH   Notional Hour

NGO   Non-governmental Organizations (NGOs)

OER   Open Educational Resources

SLT   Student Learning Time

SME   Subject Matter Experts

SCORM   Sharable Content Object Reference Model

VLE   Virtual Learning Environment

1.0   BACKGROUND

Uganda Government Vision 2040 acknowledges the potential of the ICT to accelerate development, create jobs and increase productivity. The Vision calls for a comprehensive skills development plan (in addition to investment in ICT infrastructure and innovation). In this regard therefore, the Ministry of Education and Sports (MoES) has prioritized the adoption and integration of ICT in teaching, learning and management of education and sports systems in a bid to achieve efficient and effective service delivery. To facilitate the above, the Ministry of Education and Sports has developed a 5-year Digital Agenda Strategy in Education and Sports greatly informed by stakeholder consultations in Uganda.Digital Education Standards and Guidelines (DESG) have been developed as a guide to implement the Digital Agenda in education sector. The document presents six standards and guidelines; Management and Governance, ICT infrastructure and Systems, Pedagogy and Andragogy, Content Development, ProfessionalDevelopment and Research, Development and Innovation, System Adoption and diffusion. The guidelines provide additional advice and support for policies, procedures to deliver efficient and effective digital education targeting a wide variety of audience.

1.2   TARGET AUDIENCE

The standards and guidelines target a wide variety of stakeholders. These include Education institutions (Universities, Tertiary, Secondary and Primary) Government Ministries and Department Agencies (MDAs), Regulatory and Examination Bodies, Education Development Partners (EDPs), Civil Based Organizations (CBOs), Non-governmental Organizations (NGOs), Faith Based

Organizations (FBOs) and the general public. Key user such aseducators, students, parents, school and educational institution leaders. Others targeted ateICT for education system industry and vendors, ICT experts, instructional designers, and those withresponsibility for developing digital capability,instructional designers, administrators, policymakers and quality assurance agencies.

SECTION 1: STANDARDS AND GUIDELINES FOR MANAGEMENT AND GOVERNANCE

1.0 Introduction

There is needfor strategic management and governance in the deployment of e-Learning in the education sector in Uganda. As a standard, all institutions implementing e-Learning should havea dedicated e-Learning Unit with the sole responsibility of deploying and managing the deployment of the e-Learning as well as putting in place its governance/management structure. The unit should have a suitable organizational structure and governance/management mechanism to provide quality e-Learning services to the teachers and learners in the institution. The emphasis must also be to ensure that the deployment, usage and services provided by all educational institutions meet the requirement of the National Digital Agenda and ICT in Education Policy.

1.1   Organizational Structure

1.1.1 Establishment of the Unit
The section is mainly applicable to HEIs.

2.0   In the HEIs a dedicated e-Learning unit MUST be established or utilize the existing ICT support units at the institutional level to support the institution/national agendas of eLearning.

3.0   In secondary or lower institutions ICT support units can be established within existing institutional structures to support the agendas of eLearning.

4.0   The senior management of the institution should be committed toprovide support the eLearning unit with appropriate staff and funding.

5.0   This unit can be established as a stand-alone entity or canbe part of any existing Teaching and Learning Unit/Centre.

1.1.2 Vision

a) The institutions should have a clear vision and clear outcomes on the integration of e-Learning in the teaching and learning practices.

b) The vision should be integrated and aligned with the institutions and the national education sector digital agenda for teaching and learning excellence.

c) The vision should incorporate the advancement of global knowledge and 21st century skills of teaching and learningpractices.

1.1.1 Functions

The section is mainly applicable to HEIs.

a) The unit or existing units SHOULD be empowered to plan, manage, deploy and maintain the e-Learning activities.

b) The unit or existing units SHOULD be responsible to actively promote e-Learning activities campus-wide.

c) The unit SHOULD inculcate the e-Learning adoption and usage within the Education sector.

d) TheunitSHOULD develop programmes and change management strategies towards the adoption of e-Learning.

e) The unit SHOULD provide the mechanism for monitoring, evaluation and assessment of e-Learning initiative and outcome.

f) The unit MUST be accountable to the senior management

1.1.4 Plan

The section is mainly applicable to HEIs.

a) The unit MUST develop comprehensive e-Learning plans to achieve the stated vision and outcomes that are in line with Digital Agenda.

b) Theplan MUST be well coordinated with all units/departments/faculties/colleges within the institution to ensure that all the teaching staff and students are fully engaged in e-Learning practices.

c) The institutions strategic and operational plans MUST recognize and support the use of technologies to facilitate learning and teaching.

d) Specific plans relating to the use of e-Learning SHOULD be aligned with the Education sector' strategic and operational plans.

e) Planning for e-Learning SHOULD be aligned with the budgeting process and financial allocation disbursed by the Education sector vote.

f) The planning of e-leaning SHOULD cover all aspects and stakeholder needs and requirements.

1.1.5 Security and Secrecy of Learning Management System (LMS)

a) All users of the LMS MUST authenticate with unique user credentials.

b) All users of the LMS MUST adhere to the Uganda National Computer Misuse Act 2011.

c) All users of the LMS MUST not use the system for purposes other than those of the institution.

d) The institutions must be responsible for the accuracy, integrity, and/or legality of the content uploaded to LMS.

e) The institutions SHOULD define procedures for the management of the data and database of the LMS.

f) All the above are applicable to HEIs, secondary and primary/preprimary level.

1.1.6 Quality

The section is mainly applicable to HEIs.

a) Institutions SHOULD ensure that the processes for quality assuranceare in place and integrated within the administrative and operational system of e-Learning.

b) Where appropriate, institutions SHOULD consider using resourcemechanism in the process of planning and quality improvement.

c) Coordination for the integration of quality mechanism SHOULDoccur across all key functional areas within the institution.

d) Institutions SHOULD measure the relevant key performance indicators(KPIs) and report to MoES and all key stakeholders.

1.1.7 Evaluation and Reporting

The section is applicable to all levels of education.

a) Institutions SHOULD put mechanisms to report the outcomes of KPIs to seniormanagement and to the MoES for appropriate intervention and further improvements.

b) Evaluation and feedback system SHOULD be fully integrated within the LMS for continuous improvement purposes.

c) Evaluation and reporting apply to all levels of education

1.1.8 Leadership

The section is mainly applicable to HEIs.

a) The appointed person to lead the e-Learning Unit SHOULD bean exemplary leader and preferably an academic practitioner of e-Learning.

b) The leader of the e-Learning Unit SHOULD keep abreast of local and global e-Learning trends and advancements.

1.1.9 **Committee**

The section is mainly applicable to HEIs.

a) The institutions SHOULD establish clear management structuresto identify the responsibilities and authorities within the management structure.

b) Institutions must have e-Learning management committees or ICT committees established to oversee the operationalization and direction of the overall e-Learning agenda of the Education sector.

c) The e-Learning or ICT committee MUST provide regular reportto the senior management of the institution university regarding the deployment of e-Learning within the Education sector.

d) The members of the e-Learning committee SHOULDconsist of representatives of the stakeholders. For example,Head of ICT, ICT leaders within the institutions, ICT Professional of Educators, and User of e-Learning representative such as students.

e) The committee MUST be sufficient in number, technically competent and appropriately trained to support theimplementation and to ensure good governance and effective deployment of e-Learning.

f) The committee MAY consist of several working committees that report to the management committees depending on the nature and structures in place. Suggested e-Learning Committees;

i) Technical committee

The section is mainly applicable to HEIs.

- This committee manages and maintains the e-Learningplatform and databases and provides efficient infrastructure for e-Learning deployment.

- The technical committee MUST be competent in the technical aspect of e-Learning (LMS, databases, server,etc.).
- The committee MUST be appropriately trained an technologies committee sufficient support to faculty members.

ii) Training Committee

The section is mainly applicable to HEIs.

- This committee plans and delivers regular professional development trainings related to e-Learning.
- The committee members MUST be competent with the training skills and delivery.
- Trainers MUST undergo regular competency 'Training forTrainers' Programmes offered by accredited or professional institutions of government or private agencies.
- Trainers SHOULD be certified trainers or with background training of technologyin education

iii) Content development committee

The section is applicable to all levels of education.

- This committee is responsible for overseeing, monitoring
- and providing recommendations to the senior university management on the progress of the e-Learning content
- development.
- The committee members MUST be highly competent and knowledgeable in content development authoring tools.
- The committee members MUST be knowledgeable in the current trends and capabilities of various authoring tools.
- The committee MUST be competent in Instructional Design and learning theories.

iv) Faculty/school/department/sections representative committee

The section is mainly applicable to HEIs.

- The representative is empowered to execute the resolution of the central e-Learning committee at the faculty/school/department/section level.
- The representative is responsible for carrying out the e-Learning activities at the faculty/school or departmentlevel.
- The representative SHOULD function as the faculty/ school/department/section based administrators of the e-Learningplatform for the purpose of providing support to the faculty/school/department members and resolving issueson e-Learning.
- The representative is responsible for monitoring and reporting of the e-Learning activities of the faculty/school/department/section to the management e-Learning committee.

1.1.10 **Stakeholder**

The section is mainly applicable to HEIs.

a) The stakeholders of the e-Learning Unit are the government, ministries, development partners, religious organizations, non-governmental organizations, civil society organizations, the universities, the industries, the lecturers, the students andcommunity.

b) The institution wide integration and implementation of e-Learningactivities SHOULD be aligned to the desired outcomes andvision of all the stakeholders involved.

c) The stakeholders MUST be selectively involved in relevantdecision making pertaining to the e-Learning implementation ofthe institution.

1.1.11 **Manpower for the unit**

The section is mainly applicable to HEIs.

a) The running of the unit MUST be supported by sufficientnumber of supporting staff who are technically competent andappropriately trained to support the implementation and toensure good management and deployment.

b) The team SHOULD comprise of a good mixture of instructionaldesigners,systemadministrator,planner,administrator,e-Learning experts and research officers.

c) The Instructional Design qualified staff MUST be appointed to support the content development process.

d) Suitable career path and promotional opportunities for the staff MUST be considered in their appointment.

1.1.12 Funding for the unit

The section is applicable to all levels.

a) Sufficient and continuous funding MUST be allocated by theunit to ensure the smooth and sustainable operation of the e-Learning Unit.

b) The unit MUST be accountable to the senior management of theuniversity on the outcomes of the e-Learning activities.

c) The purpose of the funding SHOULD cover content development, professionaldevelopment, training, softwareprocurement, incentives and other e-Learning adoption and diffusionactivities.

d) Education sector COULD consider creating - a smallpercentage from student allocated solely forcontent development purpose to enhance and increase the ability ofe-content for teaching and learning.

1.1.13 **Research and Development (R&D)**

The section is mainly applicable to HEIs.

a) Sufficient and continuous funding SHOULD be allocated to the unit to undertake the R&D activities related to e-Learningpractices, especially in higher education level.

b) The unit SHOULD be responsible for establishing baseline dataon the usage and enculturation of e-Learning of the institution and itSHOULD be carried out periodically for the purpose of providingthe progress report for institutional KPI and national development plan

c) The unit SHOULD provide avenues or opportunities foracademicians to carry out their research (Action Research) for innovative e-Learning practices.

d) The data collected MUST be analyzed and benchmarked againstthe global trend and the outcomes are proactively planned andproposed in order to shape and leap the future of e-Learning practices of the Education sector.

e) The R&D MUST initiate understanding of the local culture andneeds in promoting e-Learning at the institutions.

f) The institutions, especially higher education institutions SHOULD consider a small percentage (1%) from thegovernment overall funding for R&D related to Teaching and Learning.

g) The surveyon theeffectiveness of e-Learning (studentsatisfaction) SHOULD be done on a regular basis (at least once every academic year).

1.2 Governance

1.2.1 Policy and Practices

The section is mainly applicable to HEIs.

Each institution, particularly at higher education level MUST have a clear policy and strategy for digital learning. The policy document and strategies SHOULD envisage the future trend of e-Learning.

a) Policy and practices development

   i) The e-Learning policy and practices at all levels of education MUST be consistent and in support of Digital Agenda for e-Learning and National Development Plan Phase III.

   ii) The development of the policy and practices MUST involve all stakeholders of the institutions.

   iii) The evidence of continuous policy development SHOULD be documented to reflect the dynamism andcomprehensiveness of the process.

b) Policy and practices approval

   i) The approval of the e-Learning policy MUST involve the in-house and national academic bodies.

c) Policy and practices implementation

   i) The policy MUST be communicated to all stakeholdersbased on the principle of transparency, accountability and authority.

   ii) Support forcontentdevelopmentSHOULD be given whenever necessary.

d) Policy and practices revision

   i) The policy MUST be regularly reviewed (at least once every 3 years) to conform with the current developmentof e-Learning practices in the use of ICT in teaching and learning.

   ii) The rapid growth of ICT SHOULD be considered so that the policy conforms with the current trend of technology.

1.2.2 Governance structure

The section is mainly applicable to HEIs.

Institutions MUST have clear governance structure and the relationshipswithin the structure and their impact on the e-Learning policy and practices.

1.2.3 Functional integration between colleges/faculty/department/sections

There MUST exist a functional integration between the e-Learning Unit with the Colleges/Faculty/Department/Sections to ensure the smooth running ofthe e-Learning activities at all levels of the academic structure of the institutions.

1.2.4 Data collection

The section is applicable to all levels.

a) The additional database system MUST be in place for the purpose of capturing data on the e-Learning usage at institutionallevel.

b) The system SHOULD be comprehensive to capture the usage ofe-Learning down to the micro level that includes the activities carried out by individual lecturers/instructors/teachers.

c) Apart from system-based data collection, instrument-based datacollection SHOULD also be carried out periodically.

d) Data collected MUST conform to the institutional KPI and National Digital Agenda for e-Learning requirements.

1.2.5 Reporting of statistics

The section is applicable to all levels.

The data must be regularly reported to the institutional e-Learning management committees so that the committee could carry out the intervention to further improve the e-Learning deployment.The planning and implementation of e-Learning MUST complyand meet the Digital Agenda, National Development Plan and the ICT in Education Policy.

SECTION 2: STANDARDS AND GUIDELINES FOR ICTINFRASTRUCTURE AND SYSTEMS

2.0 Introduction

ICT infrastructure and Systems refers to information and communications Technologies such as computers and the Internet, as well asfixed-linetelecommunications, mobile phones, other wireless communications devices,networks, broadband and various specialized digital devices. ICT infrastructure and Systems is a basic need of every institution at all levels to deploy the e-Learning services.The proposed ICT infrastructure and Systems should serve as the basis tothe guidelines and procedures for the institutions. The planned ICT infrastructure and Systems must be aligned with the requirements of the institution and National Digital Agenda for e-Learning.

2.1 ICT Strategic Planning

The section is mainly applicable to HEIs.

a) Institutions MUST have ICT Strategic Planning which is to be reviewed regularly (at least every three years) to take into account theadvancement of technology (including mobile) and the needs of the stakeholders.

b) The implementation of e-Learning with regard to infrastructure andSystems MUST be included in the ICT Strategic Planning of the institutions.

c) ICT Strategic Planning for the e-Learning MUST be aligned with therequirement of institution, Digital Agenda and National Development Plan.

2.2   ICT Infrastructure and Complementary System

2.2.1 Budgeting

The section is mainly applicable to HEIs.

a) Sufficient funding MUST be made available for the procurement of any equipment and software to support e-Learning.

b) Institutions SHOULD make sure that evaluation processes are in placeto justify the required annual budget on the ICT infrastructure and complementary systems (such as power, computer labs, studios) with regard to e-Learning requirement.

2.2.2Maintenance

The section is applicable to all levels.

a) Institutions at all levels MUST make sure responsibilities and processes formaintenance and administration of the ICT infrastructure and systems in supporting the e-Learning services are effective and efficient.

b) Comprehensive project management processes SHOULD be inplace with clearly defined responsibility and processes appliedsystematically with priority given to the ICT infrastructure and systems of the e-Learning facilities.

c) Institutions MUST allocate resources comprehensively for maintenanceand upgrading of existing equipment.

2.2.3Facilities

The section is mainly applicable to HEIs.

a) Institutions SHOULD provide facilities for video conferencing and webmeeting for teaching and learning purposes.

b) Institutions SHOULD Plan for complementary facilities such as power and computer labs that enable effective digital education

c) Institutions SHOULD provide auto lecture capture system for selectedlecture halls.

d) e-Learning facilities for students MAY involve the use of some,or all, of the following technologies:

   i) Desktop and laptop computers, Tablets or Smart phones

   ii) Software, including assistive software

   iii) Projectors

   iv) Interactive whiteboards

   v) A high definition webcam

   vi) Headphone with built-in microphone

   vii) Electronic communication tools, including email, discussionboards, chat facilities and video conferencing

   viii) Virtual Learning Environments (VLEs)

   ix) Learning activity management systems

   x) Online meeting tools such as Zoom, Meet, Canvas, Blue Jeans etc

e) Institutions at all levels SHOULD set up an e-content development studio forlecturers/teachers/instructors equipped with the necessary equipment and softwaresuch as (but not limited to):

   i) Workstation and laptop computers tosupport fullmultimedia development and video editing services

   ii) A high definition webcam, digital video cameras completewith the green room facilities

iii) Headphone with built-in microphone

iv) Software to develop e-content

v) Interactive whiteboards

vi) Digital display

vii) Sufficient digital storage to support multimedia productionand back-up

viii) Mobile and wireless tools, including tablet and smartphones

f) Lecturers/instructors/teachers and e-Learning support staff MUST be equipped withcomputers or notebooks or any other equipment (includingmobile) needed to deploy e-Learning.

g) f) Institutions at all levels MUST provide sufficient ICT infrastructures for the studentsand staff with special needs.

h) Institutions at all levels SHOULD provide internet bandwidth connectivity with aMINIMUM of 512KB per student.

i) Internet connectivity SHOULD cover all the premises allocatedfor the learning and teaching activities and the WiFi coverage SHOULD cover a minimum of 80% of the campus buildings including the hostels.

j) WiFi facility in lecture hall/ lab/ tutorial room SHOULD cater forthe needs of BYOD for teaching and learning.

k) Institutions at all levels SHOULD provide facilities such as WiFi, power socket etc.in the lecture hall/ lab/ tutorial room to cater for the needs ofBYOD for teaching and learning.

l) For the implementation of blended/ flipped learning, access to social media (eg. facebook) and video streaming (youtube) related to teaching and learning SHOULD not be restricted.

2.3 ICT Systems

2.3.1 Learning Management Systems

The section is mainly applicable to HEIs.

a) The LMS SHOULD support the Global Learning Consortium's content package, Learning Tools interoperability (LTI) and Shareable Content

Object Reference Model (SCORM) standards for content import and export.

b) The LMS SHOULD be grounded in the context of the institution'slearning and teaching strategy.

c) The LMS MUST be part of the institutions primary IntegratedManagement System.

d) Institutions at all levels SHOULD allow the use of other cloud based e-Learningplatform (e.g. Moodle, Blackboard, Kolibri, Google Classroom) to be used; however,provision of reporting of data of usage must be made available.

e) The LMS SHOULD at least support Web 2.0 or upgraded emerging technologies based teaching andlearning methodologies and good practice.

f) Guidelines(including compliance with legal requirements,accessibility and learning designs) of the LMS SHOULD be readily available to all teaching and learning staff and in use.

g) Monitoring/tracking tools for the usage of the LMS MUST be made available and in use.

h) The LMS monitoring/tracking tools SHOULD be able to track theindividual activities.

i) Deployment of the LMS SHOULD be systematically evaluated atthe unit of study level including students' learning outcomes.

j) Institutions at higher levels MUST provide online library services including onlinejournals, online database, e-books, audio and video materials to accessed from and integrated to the LMS.

k) The LMS services SHOULD be highly accessible, scalable, flexibleand sustainable. Education sector MUST provide a 24/7 LMS uptime withproper back-up all the time.

l) The e-Learning content in the LMS MUST be available in thePRIMARY ARCHIVE for at least THREEYEARS and FIVE YEARS in the secondary archive.

m) Teaching and learning public domain resources like OER orMOOC SHOULD be made available and in use as part of theLMS.

n) Institutions at all levels MUST develop rubrics to measure the LMS effectiveness.

o) The LMS SHOULD support cross-platform to cater for the needsof BYOD.

p) Institutions at all levels MUST provide facilities for the e-Learning content in theLMS such as server and data storage.

SECTION 3: STANDARDS AND GUIDELINES FOR PEDAGOGY

3.0   Online Pedagogy

Online pedagogy is essential for the success of any e-Learning implementation.This section provides some standards and guidelines on effective e-Learning pedagogy anddelivery as well as the implementation of Blended Learning.

3.1 Principles for Effective e-Learning Pedagogy

3.1.1 Curriculum alignment

The section is applicable to all levels.

The e-Learning pedagogy SHOULD be matched with and aligned to:

a) The accredited programmes with the curriculum through clear objectives;

b) The learner's diversity and learning styles;

c) The relevance of content covered;

d) The appropriateness of student activities; and,

e) The nature of the assessment.

3.1.2 Contextualized content

The section is applicable to all levels

Learning materials SHOULD be based around meaningful goalsand work related tasks which are expressed in practical language.Contextualized content SHOULD be directly relevant to the learner.

3.1.3Innovative approaches

The section is applicable to all levels.

It SHOULD be evident why learning technologies are being used,rather than a non-technological approach which achieves the same end as effectively.

3.1.4Learner engagement

The section is applicable to all levels.

For the learner to learn, the e-Learning pedagogy SHOULD engage the learner. This means that it must gain and hold their attention, and direct attention to the most important parts, while at the same time not compromising instructional quality.

3.1.5 Learner motivation

The section is applicable to all levels.

Learner motivation is very important in e-Learning pedagogy.Motivation SHOULD be centered on the learner seeing one concrete benefit or interest in the materials. Motivation also supports the process of directing the learner's attention and helps recall.

3.1.6 Effective learning

The section is mainly applicable to HEIs.

The e-Learning pedagogy SHOULD use a range of different approaches that will allow the student to choose one that suits his/her learning preferences or that can be personalized to his/ her needs.

3.1.7 Meaningful interaction

The section is mainly applicable to HEIs.

Students SHOULD be required to interact with one another, with the instruction, with the content, with the entire class, in smallgroups or teams, one-on-one with a peer, etc. Good instructional interactivity SHOULD have the following components:

a) It offers genuine challenge and opportunities for practice to thelearner and is based on application of learning rather than rote regurgitation.

b) It is strongly aligned with the work-related context.

c) The activity is easy to perform functionally and stronglyassociated with the learning task.

d) The feedback should be specific to the learner's response andconsequences of interaction SHOULD be context related andreinforce the underlying learning points.

3.1.8 Strive for presence

The section is applicable to all levels.

The following are three forms of presence that SHOULD be strivedfor in e-Learning environments:

a) Social presence

Social presence can at least be in the following three forms:

i) Affective -The expression of emotion, feelings, and mood.

ii) Interactive -Evidence of reading, attending, understanding,thinking about others' responses.

iii) Cohesive - Responses that build and sustain a sense ofbelongingness, group commitment, or common goals andobjectives.

b) Cognitive presence

The extent to which the instructor and the students are able toconstruct and confirm meaning through sustained discussion ina community of inquiry. It

can be demonstrated by introducingfactual, conceptual, and theoreticalknowledge into thediscussion.

c) Teaching presence

Teaching presence is the facilitation and direction of cognitiveand social process for the realization of personally meaningfuland educationally worthwhile learning outcomes.

3.1.9 Coherence, consistency and transparency

The section is mainly applicable to HEIs.

The e-Learning pedagogy MUST be internally coherent andconsistent in the way the objectives, content, student activities andassessment match each other. It MUST be open and accessible in itsdesign.

3.1.10 Inclusion

The section is mainly applicable to HEIs.

The institution apply the Web Content Accessibility Guidelines (WCAG), which the World Wide Web Consortium developed in order to make web content more accessible to people with disabilities.The e-Learning pedagogy SHOULD support inclusive practice seenin terms of different types and range of achievement; physicaldisabilities that can be supported by e-Learning; different social and ethnic groups; and gender. This means that files, such as Word docs, PowerPoint slides, PDFs, etc. SHOULD be created with suitable styles and headings and whenever possible, be available in alternative formats such as large print, audio, Braille and if possible, DAISY, sometimes known as digital talking book format. For persons with visual impairment Text to Audio Tools must be adopted. For persons with hearing impairment Caption tools can be used. Software tool tools that enable accessibility should be considered.

3.2 Effective Online Course Architecture

The section is mainly applicable to HEIs.

3.2.1 The 'access to learning' and 'course introduction' SHOULD be madeavailable throughout the course.

3.2.2 Learning SHOULD be constructed in modular elements centred onclearly stated learning objectives.

3.2.3 Adaptive learning SHOULD consider the following:

   a) The learner controls content sequencing,

   b) The learner controls content presentation speed,

   c) Access to learning support is not constrained, and

   d) The learner may repeat sections as required prior to undertakingsummative assessments.

3.2.4 Instructional units SHOULD be organized such that the learner canbookmark and return to the last previously visited unit.

3.2.5 Learning events SHOULD be clearly and closely coupled to thelearning objectives and SHOULD be sufficient to allow the learner toachieve the learning objective.

3.2.6 Learning materials SHOULD be designed around learning sessions of10-30 minutes delivery duration (shorter is generally better).

3.2.7 The learner SHOULD have the amount of time for an instructionalunit indicated (normally before they start the unit).

3.2.8 Learning sessions SHOULD be designed to be as self-contained aspossible.

3.2.9 The general events of instruction SHOULD be contained within asingle learning session including at least the following:

   a) Clear statement of objective(s),

   b) Overview of instructional materials,

   c) Recall of prerequisites/context setting,

   d) Optional (pre-tests, recall and refresher questions from previous

   e) sessions, other forms of reinforcement of prior learning),

f) Delivery of instructional materials (instructional content and

g) instructional interactions/activities),

h) Provision for learning practice or formative assessment,

i) Session summary.

3.2.10 Withinthe course, there SHOULD be congruence betweenlearning objectives, instructional materials and formative as well as summative assessment.

3.2.11 Summative assessment SHOULD be sufficiently detailed to ensurethe learner has achieved the learning objectives.

3.3 Effective Online Course Delivery

The section is mainly applicable to HEIs.

3.3.1 Course objectives

a) The learning objectives of the course MUST be clearly statedand understandable to the student.

b) A complete and clear course syllabus SHOULD be available forreview.

c) The course SHOULD be organized in coherent and sequentialmanner.

d) Assignments are aligned with stated objectives/learningoutcomes.

e) Meaningful assessments SHOULD be created and provided asfollows:

　i) The type and quality of student assessments included areappropriate for the course and tied to course objectives.

　ii) Students are provided opportunities for formativeassessment and feedback.

　iii) Instructor feedback is more than a grade.

　iv) Clear grading criteria are defined.

　v) Consistent feedback is given.

vi) Student assessments are external to the online learningenvironment where appropriate.

3.3.2 Pedagogical: Learning and teaching theory

a) Instructor/facilitator SHOULD facilitate the learner's efforts in constructingand interpreting new knowledge (Active Learning) through:

i) Student engagement

- Students are requested to introduce themselves to thegroup.
- Discussions are learner focused.
- Students have opportunities to make choices about coursecontent or activities.
- Cooperation and collaboration between students is encouraged.

ii) Course facilitation

- Moderate discussions.
- Present content in a logical progression.
- Make content available to students in manageablesegments.
- Scaffold important information to learners who face difficulties
- Provide a statement introducing students
- Create course assignments and projects that requirestudents to make appropriate and effective use of external resources, including print, library, web-based, and other electronic resources.
- Provide students with mental models (schemas) tohelp organize materials.

b) Instructor/facilitator SHOULD integrate the diversity of students' needsand experiences into the learning process (Constructive Learning, Prior Knowledge) by considering:

i) Diverse learning styles.

ii) Prior experience and knowledge.

iii) Cultural diversity.

c) Instructor SHOULD encourage and develop higher-level criticalthinking (Intentional Learning) by

i) Providing opportunities for students to work at the higherlevels of Bloom's taxonomy: knowledge, comprehension,application, analysis, synthesis, and evaluation.

ii) Giving students opportunities to engage in abstract thinkingand critical reasoning.

d) Instructor/facilitator SHOULD promote self-directed learning, guideddiscovery and reflection (Reflective Learning) by:

i) Encouraging personal autonomy.

ii) Providing opportunities for reflection (meta cognition).

iii) Encouraging self-assessment.

iv) Providing opportunities to identify topics, problems, cases

v) and make informed judgments.

e) Instructor/facilitator SHOULD facilitate learning through interactive,collaborative activities (Collaborative Learning).

i) Encouraging learner cooperation.

ii) Developing varied collaborative activities: research andgroup projects; peer assessments.

f) Instructor/facilitator SHOULD anchor instruction with authentic taskssituated in real-world contexts (Contextual Learning) by creating:

i) Activities relevant to learners that allow learners to attachpersonal meaning to content.

ii) Authentic activities that involved problem-based or case-based activities.

iii) Simulations (e.g. role-play) that apply to real-world issues.

g) Instructor/facilitatorSHOULD promote a conversational, socialanddialogical process (Conversational Learning) by:

i) Incorporating social aspects to improve satisfaction, providea realistic environment, present multiple viewpoints, and overcome anonymity.

ii) Developing varied opportunities for interaction: student-student; student-instructor; student-content.

iii) Ensuring a sense of community by:

- Creating a safe environment;
- Participating in discussions (and/or chats) and post a self-introduction;
- Acknowledging learner contributions;
- Moderating disagreements and group problems;
- Providing separate communication opportunities forsharing non-course information.

3.3.3 Class Management

a) Post course materials online in advance so learners can plan.

b) Ensure that all learners are 'on board' at the beginning

c) Provide clear and concise directions on how to navigate throughthe course.

d) Convey changes and updates.

e) Return learner calls/emails quickly to allow learners to progress.

f) Refer problems to appropriate sources and follow up to ensureresolution.

g) Have an alternate plan in case the LMS is unavailable.

h) Make a course backup at the beginning and the end of theacademic calendar.

3.4 Implementation of Blended Learning

The section is mainly applicable to HEIs.

3.4.1 Blended learning implementation options

a) The online component of a blended learning course MAY beimplemented according to one of the following ways:

   i) By hours in week

   - For example , the traditional course of 3 hours F2Finstruction per week for a three credit course is reducedto 2 hours F2F + 1 hour guided online learning.

ii) By weeks

- Online learning is designed according to the weeks in thesemester/term.
- Example: 10 weeks of fully F2F is followed by 4 weeks oftotally online learning.

iii) By alternate weeks

- Online learning is designed into alternate weeks.
- Example: 1 week of F2F is followed by a week of totalonline learning and so on.

iv) By topics

- Topics are chosen to be taught online and the hours areestimated based on the length and depth of the topics.

v) By tasks

- Tasks are chosen to be completed online rather thanin-class. The estimated time to complete is calculated equivalent to student learning time in class.

vi) Case by case

- Technology is integrated into the classroom. Students areassigned technology related tasks (the present F2F hours are maintained).
- Utilizing other models of blended learning such as FlippedLearning or wrapping a MOOC is encouraged as long as the instruction and learning tasks are carefully designedand student learning time calculated to meet the credit hour requirement.

3.4.2 Credit hours and student learning time (SLT) for blended learning

a) Blended learning MUST be implemented in accordance with the credit hours specified for each course:

i) Course coordinators and e-Learning instructors MUST plan for the online component to fulfil the student learning time(SLT) necessary for the credit requirement of the course.

- A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student
- achievement.
- MQA : A credit is the total student learning time (SLT)required to achieve the identified learning outcomes for a particular module at the micro level and for the programmeat the macro level.
- One credit equals 40 notional hours (NT) of SLT.

ii) The online component of a blended learning coursecomprises activities such as lectures, projects, problem based tasks and discussion in general. These can be in the form ofwatching and comprehending instructional videos, playing a learning game, watching and comprehending animations, completing a simulation, readings, forum discussion, MOOCparticipation, responding and posting one's work with peer evaluation, self-assessment, quizzes etc.

iii) Calculation of online student learning time SHOULD be based on the following activities:
- The time spent in synchronous live instruction. This is equivalent to F2F on location instruction.
- The average time spent on a screen and the number of screens viewed in the course of online instruction. Theaverage time spent on a "screen" is generally calculated as being between 3-5 minutes per screen.
- The run-time for required media based assignments. This must take into account the actual length and the expectedmultiple viewings of the media (video, audio, animation, simulation) for review and re-enforcement of the material.
- The time required to consume content such as by reading an article, watching a self-paced instructional video,playing an instructional game etc.
- The instructor expectation of time spent in online instructional tasks and activities such as:

i) Postings to group discussion sites/bulletin board.

ii) Online group project work

iii) Use of class social media sites for group discussion/ participation

iv) Student-teacher interaction

v) The suggested allocation of SLT for a Blended Learningcourse with 30% -50% online component is given below

vi) Attendance in the blended mode teaching need notbe measured solely on physical presence. It SHOULD include learner's engagement (e.g. forum participation) incompleting the online task which may or may not be traced by the system. Student engagement in the online taskSHOULD be seen as equal or more important than mere physical presence.

3.4.3 Role of the instructor/facilitator and teaching hours

a) The role of the e-Learning instructor/teacher shifts towards a facilitator and a collaborator as percentage of online learning increases.

b) Delivery and teaching hours:

i) The traditional teaching hours or instructional time spent ina specific location (class, lab etc.) need not necessarily apply to online instruction where learning takes places anytime,anyplace and anyhow.

ii) Extra hours should be factored in to account for the hours spent on instruction and facilitating student online learning.

iii) A minimum of 2 hours online is equivalent to 1 hour F2F on location.

3.5 Online Instructional Interactions

The section is applicable to all levels.

3.5.1 The learner SHOULD be actively and mentally engaged with theinstructional content through instructional activities.

3.5.2 Instructional materials SHOULD contain meaningful interactions (thismay be interaction with the materials, interaction with the facilitatoror interaction with other students).

3.5.3 Interaction SHOULD be focused on learning content, and SHOULDcause the learner to reflect on the learning content. Interaction(wherever practical) SHOULD directly involve the learning contentrather than being mediated through standard interface elements.

3.5.4 Interaction SHOULD be focused to allow users to gain confidencethat they are learning and reinforce content presentation throughactive manipulation.

3.5.5 Formal student interaction, required by learning objectives SHOULDbe focused on the learning objective and SHOULD be moderated asappropriate.

3.5.6 Asynchronous student interaction with learning facilitator SHOULDoccur within predefined time windows and latency periods.

3.5.7 Interactions that support learner practice SHOULD:
   a) Accurately reflect the context of real world skill application,
   b) Explain what the reason for the interaction is,
   c) Where complex or extended, be broken into sub-components,
   d) Be interspersed through the instructional session as opposed tobeing concentrated in one particular section of a session,
   e) Follow a designed elaboration strategy - should build fromsimple to complex, or should support skill practice with worked examples prior to scenario based learning,
   f) Feature reinforcement, or multiple examples,Include examples as to where the learning might be applied,
   g) Be paced to allow learner reflection and consolidation.

3.5.8 Assessment questions SHOULD:
   1. Be constructed in such that the mechanism for answering questions is straight forward,

2. Be focused on testing knowledge through application to a job relevant task (and avoid the student simply 'parroting' the information back in a rote fashion),

3. Cover areas and learning objectives that have been previously taught,

4. Be pitched at a suitable level of difficulty for the audience,

5. Be clearly worded (i.e. avoid negative constructions),

6. Have clear instructions as to how to answer the question,

7. constructions should be varied, and suitable for the type of question being asked,

8. Be programmed to prevent invalid questions or answers,

9. Give the learner the opportunity to change their mind,

10. Where questions or assessments are timed this is to be clearly stated at thebeginning, and an indication of elapsed orremaining time to be displayed.

3.5.9 In formative assessment questions, feedback SHOULD be:

a) Specific to the user's answer,

b) Focused on the learning goal,

c) Containing information relating to the question and the answer to stimulate user recall,

d) Comprehensive and suggest a further cause of action to the use

3.6   Features of Good Online Instructors

The section is applicable to all levels.

3.6.1 Besides experience with and knowledge of course content, thefollowing COULD be used as a checklist for selecting a good online instructor.

a) A basic understanding of the Internet, word processing, and e-mail.

b) Some background or experience in teaching or training.

c) Reliable Internet access at work or home.

d) Prior experience teaching the course in a face-to-face setting orexperience with the content.

e) Significant time to devote to course development and abilityto complete initial drafts of course content prior to the courseopen date.

f) The ability to devote 6-9 hours per week to teach the course(for a 3-credit hour or equivalent), depending on the level of interaction and volume/length of assignments.

g) The ability to express ideas, concerns, suggestions, and answersto students succinctly and clearly, in writing.

h) A willingness to modify and adapt teaching methods andstrategies based on student or participant feedback.

i) Able to integrate technology into teaching creatively.

3.7 Facilitating Online Discussions

The section is mainly applicable to HEIs.

The following guidelines in facilitating online discussion COULD be adopted:

3.7.1 Give students clear expectations about online discussion requirements, deadlines, and grading procedures.

3.7.2 Assess the quality as well as the quantity of the students' onlineposts. Using rubrics will allow students to have a clear guideline of your expectations for quality of their posts

3.7.3 Provide a schedule for students of upcoming discussion boarddeadlines. Give as much notice as possible.

3.7.4 Provide structure for students to post to threads. A good structure lessens the frustration of what to write.

3.7.5 Do not allow domination of the discussion. If students are dominating the discussion, privately ask them to slow down a little.

3.8 Assessing Discussion Board Activities

The section is mainly applicable to HEIs.

Assessing discussion board activities COULD take many forms. Regardless of the type of assessment strategy or tool used, the following guidelinesCOULD be adopted:

a) Assessment MUST match learning outcomes

b) Assessment MUST be aligned with instruction.

c) Students MUST be given clear guidelines regarding how their work willbe assessed.

Assessment COULD be done in the following ways:

i) Teacher Assessment

Teacher assessment is probably the most commonly used assessment. Anyof the tools listed on this page can be used by teachers to assess their students.

ii) Self-Assessment

Encourages students to think about their own learning and to reflect uponareas of strengths and weaknesses.

iii) Peer Assessment

Actively involves students in the assessment process and encouragescritical thinking skills. Students often respond more positively to feedbackfrom their peers.

3.9 Guideline for Fair Use

The section is mainly applicable to HEIs.

Under Fair Use guidelines, instructors MAY use a portion of a copyrightedwork once in their classroom teaching during a course. Fair Use MUST stand the

tests of brevity, spontaneity for teaching effectiveness, and avoid cumulative effect that impacts a single work or author. Current copyright law gives educators the ability to use certain copyrighted works for educational purposes without securing permission or license.

3.10 Dealing with Cheating/ Plagiarism

The section is mainly applicable to HEIs.

There will always be students attempting to cheat in exams regardless of the delivery methods. The following are some guidelines on how instructors COULD initiate to make cheating more difficult:

a) Use question pools and randomize the question selection. This will allow instructors to make each student's test at least slightly different from the next. The greater the number of questions in the pool, the more the randomization that can occur.

b) Make the test available for a short time-period. There are two waysinstructors can achieve this effect. They can place a time limit on howlong students will have to complete the test. They may also control the amount of time students have to access the test by limiting the dates of availability.

c) Present one question at a time. Any item presented on a computerscreen can be copied and printed including your tests. One way to deter this from occurring is to present one question at a time and prohibit backtracking. This allows a student to see only one question on the screen at a time and they are not allowed to navigate back to a previous question once it is answered.

d) Use a lock-down browser software to secure online tests. This software is administered at an enterprise level and will keep students from copying and/or printing tests, switching windows, accessing other URLs and block other applications from running. This option will require that students go to a testing center in order to take their tests.

e) Require a proctor. Instructors can require students to take the tests in aproctored environment. This can usually be set up with another school, library or testing center. Proctors are provided with password access to your test and specific instruction regarding what a student may do or use during the assessment.

3.11 Encouraging Academic Honesty

The section is mainly applicable to HEIs.

Academic honesty and plagiarism have become more complicated issues with the explosion in access and use of the Internet. The following are some ways that COULD be adopted by instructors on how to encourage academic honesty and discourage plagiarism.

a) Include information in the syllabus about intellectual property and academic honesty. Go over that information with the class.
b) Provide online resources that further explain the details (and examples) of plagiarism and adhering to copyright law. This is sometimes more meaningful at the time of the assignment.
c) Be a role model.
d) Explain where and how online resources are obtained.
e) Exemplify and discuss ways to cite resources.
f) Discuss the libraries' role in helping access to electronic reference materials.
g) Discuss the negative impact of online "paper mills" that allow students to purchase work instead of creating their own.
h) Indicate the utilization of search engines or software to detect plagiarism.

SECTION 4: STANDARDS AND GUIDELINES FOR CONTENT DEVELOPMENT

4.0 Introduction

Development of the e-contents or digital content is one of the most important aspects inthe implementation of e-Learning programmes. This section will discussfive important aspects of e-content development: approaches of contentdevelopment, software and tools, process of content development,quality of content development and finally the contemporary and futureapproaches.

4.1 Approaches of Content Development

The section is applicable to all levels.

There are various approaches to content development and which approach is best for all levels education will be very much dependent on the time constraint, availability of expertise, budget and the e-Learning culture in the institution. Institution MAY consider adopting one or more of the following:

4.1.1 Self-Development (Lone Ranger) Approach

This is the simplest approach to develop contents for e-Learning whereby the lecturer/instructor/teacher involved will create contents to be used in his/her own online class. To adopt this approach, the instructor SHOULD acquire some skills to use certain tools to create contents which are both interactive and engaging.Currently, there are a number of tools which can be considered asrapid e-Learning software, such as screen casting software andPowerPoint to Flash conversion software. There are number of softwareavailable for content development which institutions can choose based on their relevance and affordability.

4.1.2 Outsource

The second approach is by outsourcing the content developmentprocess to a commercial content developer. This approach has the advantage of quick turnaround time and, if properly managed, will produce the best results.

a) The Institutions MUST form a team of knowledgeable persons who canrepresent the institution in all discussions with the vendor.

b) The team MUST be able to set clear requirements and MUST communicate them clearly to the vendor.

c) A proper quality assurance process MUST also be in place. It SHOULD be done not only at the beginning or the end of theproject but also throughout the development process.

d) In selecting the vendor, the e-Learning team SHOULD first evaluate the capability of the people who will be working on the project, and then the capacity of the vendor in terms of human resources, as well as the vendor's financial stability.

e) The institutions MUST be prepared for any potential risks. Thespecifications and guidelines are the first important documents that

define acceptable quality, and they are also the documents that MUST be referred to in the event of disputes.

4.1.3 In House Development

Higher Educational Institutions should be build capacity for in-house content development. In house content development requires the work of a group of professionals who will form a team to develop contents for the institutions.

a) The team SHOULD include a project manager, instructionaldesigners (IDs), subject matter experts (SMEs), web developers,graphics artists, multimedia developers, programmers and technical support staff.

b) The project manager SHOULD conduct needs and audience analyses before starting the content development project He / she SHOULD also coordinate all activities and roles in thedifferent stages of the process.

c) Instructional designers (IDs) SHOULD work with managers tounderstand the curriculum requirements, collaborate with SMEsto define which learning outcomes are to be covered in thecourse and choose the appropriate instructional strategy. IDsalso SHOULD be responsible for designing specific e-Learningactivities and materials that will be part of the course.

d) The subject matter experts (SMEs) are the lecturers who contribute the knowledge and information required for a particular course. They SHOULD collaborate with IDs to designa course and define assessment strategies. In the full online learning mode, SMEs SHOULD be involved in writing the text ofe-Learning lessons, while in the blended mode SMEs SHOULD act as online as well as classroom instructors.

e) Web developers SHOULD be responsible for developing thecourse websites, assemble the course elements, create the courseware, adapt the interface of a learning platform (LMS) and install the courseware on a server.

f) The Graphics artists SHOULD create graphics includingnavigation buttons and icons.

g) Multimedia developers are personnel who SHOULD be doingthe audio and video editing, animation, and develop media and interactive components of the courseware.

h) Sometimes programmers are needed to develop complexinteractions within the courseware. The technical support staffSHOULD assist both producers and users of e-Learning courses at every stage of the process.

i) Some of the roles described in this section COULD be combinedinto a single job profile.

j) The actual composition of the team depends on factors suchas the size of the project, the amount of work outsourced, the

4.1.4 Lecture/lesson Capture System

Lecture/lesson capture is a general term describing any technology thatallows instructors to record what happens in their classrooms and make it available digitally.

a) The technology SHOULD record the instructor's audio andvideo, as well as the presentation conducted using PC, laptop ortablet, synchronize them and webcast them as streaming videos or archives for video on demand mode.

b) Lecture/lesson capture systems for the Institutions SHOULD be managed by the technology or ICT support unit.

c) The system SHOULD be automated in ways that allow thelecturer/teacher to use a touch screen interface to start and stop the recording of a lecture. The recording SHOULD be processed anduploaded to a server that can be accessed by students.

d) If a class is conducted in a location where an automatedrecording system is not available, a portable recording systemCOULD be used. Some editing is required to synchronize lectureslides for viewing alongside the relevant sections of audio and/or video recordings of the instructor.

e) If the two options above are not available, the lecturers/teachers COULDuse some commercially available software applications tocapture their own video, the computer screen, PowerPoint, and audio.

4.1.5Open Educational Resources (OER)

Another approach for content development is to make use of openeducational resources (OER) which are freely available from the internet.The OER are usually released under creative commons license thatpermits access, use, repurposing, reuse and redistribution by others with no or limited restrictions. OER materials can be downloaded, shared, reused and remixed for various educational purposes.

a) Locating OER

To locate suitable OER we COULD use some specialized searchengines that search specifically for OER. Some examples:
  i) Creative Commons Search: http://search.creativecommons.org.
  ii) OpenCourseware Consortium:
      http://www.ocwconsortium.org/courses/search.
  iii) Another approach is by searching major OER repositoriessuch Massachusetts Institute of Technology Open CoursewareRepository (MIT OCW).

b) Development of OER
  i) The process of developing OER contents is very similar tothe process of developing learning materials to be used inthe classroom. The main difference is the requirement thateverything included in the contents MUST be free of anycopyrighted materials.
  ii) If it is necessary to include copyrighted materials in thedeveloped resource, written permission of the copyrightowner SHOULD be obtained.

iii) In order for the OER to be useful to others, the file type, sizeand formatting MUST be fully accessible and adaptable.For example, for the common file types, the following fileformats SHOULD be used:

- File type   Format
- Text files   Open document format (.odt);
- rich text format (.rtf);
- portable document format (.pdf)
- Images   PNG or JPEG
- Audio   MP3
- Video   MPEG4

iv) Before publication, the owner SHOULD decide how open theresource will be and then select the corresponding license togive access while preserving the author's rights.

c) Copyright of OER

Creative Commons (CC) licenses are a specific type of openlicense, used commonly with OER, whichallow sharingresources for free. For more information andthe generation of CC licenses, Education sector SHOULD refer to CreativeCommons website (http://creativecommons.org).

4.2   Software and Tools

The section is applicable to all levels.

Effective online contents will usually involve the use of the followingelements: text, image, graphics, audio, video, animation, and or simulation.Choosing the correct software or tools for e-content development is alsoimportant.Factors that developers SHOULD consider when choosing the software ortool are usability, maintenance, accessibility, compatibility and affordability.

4.2.1 Usability

In order to develop e-content, it is wise to choose the developmenttool that the developer is familiar with. Also, the tool SHOULD havea user-friendly interface that can be familiarized easily.

4.2.2 Maintenance

If a developer chose to use a downloadable software or tool fromthe internet, it is advised that the developer look for any onlinetutorials related to the software or tool. This can be helpful in timeswhen help is needed to solve immediate problems related to thesoftware or tool while developing e-content.

4.2.3 Accessibility

a) The developed e-content lessons SHOULD be usable on variousdevices including smart phones and other mobile devices.

b) If the developed e-content lesson is available online, it SHOULDbe accessible with several web browsers (e.g. Internet Explorer,Edge, Mozilla Firefox, Safari, and Google Chrome).

c) The e-content lessons that support various devices usually areusing HTML5 or SCORM formats. Recommended standards forvarious forms of e-contents are listed in Annex 2.

4.2.4 Compatibility

a) If the chosen software has to be downloaded first beforelessons can be developed, SHOULD be choose software that iscompatible with various operating systems such as Windows,Linux and Macintosh.

b) The best e-content software MUST be flexible in terms of fileformats and can easily incorporate documents, audio, video andinteractive components.

4.2.5 Affordability

Basically the tools that can be used to develop such contents canbe divided into three types. They are commercial, free and onlinesoftware.

a) The commercial software usually requires license which COULDbe purchased either yearly or perpetually.

b) The free software COULD be downloaded from the Internet andsome of them are as good as the commercial ones.

c) The online version is usually hosted on a server and users MUSThave Internet connection to use them. The choice of software isvery much dependent upon the budget of the institution, easeof use and user requirements.

Some examples of software and tools commonly used for contentdevelopment are listed in Annex 3.

4.3   Process of Content Development

The section is mainly applicable to HEIs.

The development of e-content materials is a complex one, involvingmultiple steps or phases. For educational or training materials, instructionaldesign model (ID Model) is a process framework that SHOULD be used.These models SHOULD be used to guide the approach to the art orscience of instructional design. Prescriptive models provideguidelines or frameworks to organize and structure the process of creatinginstructional activities.There are numerous instructional design models available such as ADDIEModel, ASSURE Model, Dick & Carey Model, Hannafin & Peck Model,Waterfall Model, Rapid Prototyping Model, Hypermedia Design Model,Multimedia Design Model and the list is continually growing.

4.4   Quality of Content Development

The section is mainly applicable to HEIs.

The development of quality e-contents SHOULD consist of content, design and delivery. Content includes the research and organization of materials. Design is the architecture of the e-content and the graphical enhancements. Delivery is how the idea and messages are being presented.

The followings are some key points for planning, creating and delivering quality e-Content for learning and teaching:

4.4.1 Design and layout of the contents SHOULD be consistent.

4.4.2 Organization and presentation of information SHOULD be clear.

4.4.3 Navigation within the content SHOULD be consistent and easy-to- use.

4.4.4 Design of materials and graphics used MUST be presentable.

4.5 Intellectual Property Rights and Copyright Issues

The section is applicable to all levels.

Intellectual property rights is important as it gives protection to the owner or developer of the e-Learning resources, provides rules and regulations to the users that have access to the materials and guidelines on how the e-contents can be distributed. In order to encourage continual development of e-content, the protection of copyright is very important. In Uganda, the protection of IPR is managed by Uganda Registration Services Bureau (URSB). E-Content developers, authors and users SHOULD have a clear understanding on the basic principle of intellectual property rights protection and copyright law. These include what is protected under the law, what constitutes copyright infringements and the exceptions under fair use policy.

4.6 Contemporary Approaches in e-Content Development

The section applicable to all levels.

Currently, mobile and personal technology is increasingly being viewed asa delivery platform. Sooner or later this emerging trend will affect the way e-contents are being developed.

4.6.1 Mobile First

This is the approach when the e-content developers SHOULDprioritize the mobile platform first and the other platforms becomesecondary. In other words, the developer starts the entire designprocess by designing for the smallest screen.

4.6.2 Mobile Ready

In thisapproach, thecontentdeveloper SHOULD develope-contents that are flexible enough to be viewed by using either thedesktops or mobile appliances, depending on the user preferences.Mobile ready concept can be associated with the responsiveapproach to give satisfactory e-content user experiences when theyview it.

4.6.3 Responsive

The basic idea of this approach is that the e-content SHOULDdetect and deduce what type of device is currently being used toview it and adapt its content appropriately to fit the screen of the device.Responsive design approach aims to improve user experienceswhen browsing the e-content by repaginating text, resizing photos,provide optimized useful navigational features for smart phones,tablets, e-readers, laptops, game consoles and other internet- enabled devices.On top of that, it can also adjust the file size of the e-contentdepending on the bandwidth and speed of the receiving device.Development of e-content in HTML5 supports responsive designfeatures so that the content developed has the same impact across the myriad of devices that the learners use.

4.6.4 Assistive/ Adaptive Technologies

Assistive or Adaptive Technology commonly refers to products,devices or equipment, whether acquired commercially, modifiedor customized, that are used to maintain, increase or improve thefunctional capabilities of individuals with disabilities. Assistive (orAdaptive) technology enables people with physical disabilities tohave more accessibility when navigating web pages and access e-content materials; such technologies include navigation screenreader and speech recognition.

4.6.5Gamification

Gamification is the use of game thinking and game mechanics in anon-game context to engage users/audiences and solve problems.Knowledge retention for game or simulation is generally higher thantraditional instruction.

4.6.6   Virtual Reality

Virtual reality (VR) can improve digital education by providing students with memorable and immersive experiences that would otherwise not be possible. VR content can be made accessible to every student and can be easily monitored by teachers. Virtual experiences have the power to engage and inspire students in a unique and powerful way.

4.6.6   Augmented Reality

Augmented Reality (AR) is a technology that blends digital information with the information from physical-world environments, enabling users to interact with virtual objects and view the physical environment (usually through a digital camera in a mobile phone or tablet) simultaneously. AR enable digital content to be created in real time with smartphones, laptops, tablets etc.

4.6.7 Artificial Intelligence

Artificial Intelligence content in education enables institutions to carve out personalized learning experiences for students. From student data, AI can analyze the student's learning speed and needs. With the results, institutions

can personalize course outlines that enhance learning based on students' strengths and weaknesses.

SECTION 5: STANDARDS AND GUIDELINES FOR TRAINING AND PROFESSIONAL DEVELOPMENT

5.0   Introduction

e-Learning instructors, trainers and content developers require qualityprofessional development to ensure the successful delivery of e-Learning.e-Learning instructors must be well trained in online course design and/or online facilitation; trainers and content developers must be equippedwith the latest knowledge and skills of using technology tools to creatematerials to support e-Learning. These guidelines for professionaldevelopment place focus on the lecturers/teachers/instructors in institutions who are the e-Learningfacilitators and most often, the content developers.

5.1   Institutions Plans for e-Learning Training

The section is applicable to all levels.

Institutions MUST strategically plan for e-Learning training.

5.1.1 A clear and structured annual strategic training plan based oninstitutions' needs and current developments MUST be formulated anddocumented.

   a) Training plan MUST include components to enhance (1)awareness, (2) adoption of e-Learning and (3) instilling culture ofe-Learning in the institution.

   b) A clear process that includes all the above three componentsMUST be in place.

5.1.2 Planning of training on e-Learning MUST include both staff andstudents.

5.2   Training Facility

The section is mainly applicable to HEIs.

e-Learning instructors and content developers MUST have access totraining facility.

5.2.1 A centre or unit MUST be established in the institution to manage training forthe e-Learning instructor.

5.2.2 A dedicated e-Learning training lab MUST be provided fore-Learning training.

5.2.3 A dedicated content development lab /studio MUST be provided fore-content development training.

5.2.4 Relevant tools and software MUST be made available to contentdevelopers.

5.3   Training Programme for e-Learning Instructors

The section is applicable to all levels.

5.3.1 Education sector MUST provide initial briefing and awareness programme forprospective e-Learning instructors.

   a) The relevant center or unit MUST conduct briefings andpromotions to enhance awareness on e-Learning among institutions lecturers/teachers/instructors and students.

   b) The relevant center or unit SHOULD provide information one-Learning through emails and web pages.

5.3.2 Institutions MUST provide training for the e-Learning instructors.

   a) The relevant center or unit MUST schedule training sessions anddevelop relevant e-Learning training module,

   b) Training MUST be provided in pedagogical, technical andnetworking dimensions.

   c) A pedagogical dimension, which implies an understandingand application of the opportunities to use e-Learning in alocal curriculum context.

   i) Principles of teaching SHOULD emphasize the underlyingtheory oflearning process(Cognitive,Psychomotor,Affective).

ii) Comprehensive training MUST be provided by teacher professional training body orother similar institutions on online pedagogy – learningactivities, the know-how to replace f2f with online teachingand tips on strategies for successful online facilitation.

iii) A technical dimension, which implies an ability to select,use and support a range of technology and ICT resourcesas appropriate to enhance teaching effectiveness; alsoto update skills and knowledge in the light of newdevelopments.

iv) A collaboration and networking dimension, which includesan understanding of learning networks and collaborationwithin and between partners; and the ability to create andparticipate in communities of practice.

d) Training MUST be provided at the minimum of two stages:

   i) Basic Training for the e-Learning instructor Training in onlinepedagogy and the basic use of a Learning ManagementSystem-onlinefacilitation,onlinediscussion,onlineassessment and content uploads must be provided to alle-Learning instructors. These include models of blendedlearning such as the flipped classroom and mobile learning.

   ii) Intermediate Training for the e-LearninginstructorTrainingin instructional design, resource and content development, sharingand collaboration,research and new online technologies must be madeavailable to e-Learning instructors/online educators.These includeTraining and professional Development

   - At least one full-fledge authoring tool for e-contentdevelopment
   - Latest web and social media tools
   - Utilization and development of open resources

e) Training of Trainers /Master Trainers

- Qualified instructors MAY be awarded the lecturers/teachers the master trainerstatus upon completion of relevant training modules set by the Training Institutions Offering Pragrammes in online delivery.

- The Institutions MAY employ trainers who are not e-Learninginstructors to train on the use of technology tools and theymay be awarded the institutional master trainer status uponcompletion of relevant training modules set by the university as ToT or equivalent.

5.3.3 e-Learning instructors MUST be kept abreast of the latest e-Learningtechnologies.

a) The MoES and institutions MUST organize seminars or webinars onrecent e-Learning technologies.

b) Selected online educators MUST be given the opportunity tobe trained nationally or internationally;

c) Institutions SHOULD allocate grantsfor e-Learning to lecturers/teachers/instructors to participate in training programmes.

5.4   e-Learning Instructor's Academic Load

The section is mainly applicable to HEIs.

The institutions in all levels MUST recognize online teaching or online instruction assimilar or more in terms of load and instructor's teaching time as that ofthe face to face in person instruction.

5.4.1 Teaching hours: Hours spent teaching in an online environmentMUST be calculated and credited into the e-Learning instructor'sofficial teaching hours.

5.4.2 Teaching Evidence: Educators MUST be able to show evidence thatthe online learning has taken place based on the platforms theyuse. These may be a tracking system in the LMS or links to theconversational URL.

5.5   Provision of Training

The section is mainly applicable to HEIs.

5.5.1 Institutions at all levels MAY enlist e-Learning training providers that include:

a) – an accredited national training center.

b) Institution own e-Learning training center.

c) Vendors who are enlisted for specific e-Learning tools.

d) Experts may be enlisted to conduct seminars on recente-Learning tools and techniques.

5.6   Training Budget

The section is mainly applicable to HEIs.

5.6.1 A minimum of 0.5% of institutions yearly training budget SHOULD beallocated for e-Learning training.

5.6.2 e-Learning trainers SHOULD be given rewards for the hours oftraining conducted.

5.7   Mode of Training

The section is mainly applicable to HEIs.

5.7.1 Training MAY take place on an individual basis, group workshops orseminars.

5.7.2 e-Learning training MAY be conducted via several modes:

a) Face-to-face on location or face-to-face onsite

b) Blended learning

c) Flipped training

d) Web seminars

5.7.3 It MAY also be conducted as

a) Training on demand

b) Clinic basis

c) Ad-hoc training

5.8   Training Hours and Certification

The section is mainly applicable to HEIs.

5.8.1 Institutions at all levels MUST provide sufficient number of e-Learning trainers.

   a) Institution e-Learning trainers MUST attend a professional Training of Trainersoffered by an accredited or certified body.

   b) Institutions e-Learning trainers MUST be trained on the latest andfuture technologies such as gamification, VR, AR, AI and learning analytics.

5.8.2 Hours spent being trained MUST be recognized by the institutions.

   a) Training hours MUST be credited into the e-Learning instructor'sofficial training record.

   b) A minimum of 20% of institutionsteachers/instructor's continuous professionaldevelopment(CPD)allocation SHOULD bededicatedtoe-Learning training.

   c) The recognition of CPD hours MAY include the non-face to facetraining.

5.8.3 e-Learning instructors and trainersMUSTbe given the acknowledgment by the institution upon completion of various levels oftraining.

5.8.4 e-Learning instructors MUST be given opportunity to be trained ase-Learning trainers and be given trainer certificate upon completionof both basic and selected e-Learning modules.

5.8.5 Institutions SHOULD acknowledge the skills of an e-Learning trainer; Institutions SHOULD set to give annual award or recognition to the best training facilitator or e-Learning trainer.

5.9   Evaluation of Training

The section is applicable to all levels.

5.9.1 The effectiveness of each level of training MUST be evaluated. Institutions MAY assess according to:

a) Reaction - increase in awareness and what participants thought and felt about e-Learning (End of training session).

b) Learning - the resulting increase in knowledge and/or skills, and change in attitudes (End of training session).

c) Behaviour - transfer of knowledge, skills, and/or attitudes to the trainee's classrooms (3-6 months after training session).

d) Results - the final results that occurred because of participation in a training program (more flipped classroom, e content developed etc.).

5.9.2 The relevant e-Learning unit or centre SHOULD be responsible in assessing and evaluating the effectiveness of training.

5.9.3 Both quantitative and qualitative evaluation MAY be used.

5.9.4 The evaluation MUST be properly reported and documented.

5.10 Learning Communities

The section is mainly applicable to HEIs.

5.10.1 Sharing of expertise among Education sector SHOULD be practiced.

5.10.2 The ministry SHOULD provide opportunities for educators to build online learning communities and to work together in pairs or teams, with access to follow-up discussions to share information.

5.10.3 e-Learning instructors SHOULD be encouraged to be members of existing global e-Learning communities.

5.11 Research, Development and Innovation

The section is mainly applicable to HEIs.

5.11.1 e-Learning Content Development

Institutions at all levels SHOULD support the e-Learning instructor's initiative to produce e-content/e-Learning resources.

a) Facility, software and training are provided to support e-contentdevelopment.

b) Completed and reviewed e-content is recognized as an indicatorof the online educator's scholarship.

c) e-content that prescribes to criteria set by the institutions isrecognized as equivalent to academic publication.

d) A national repository is made available for the online educatorto share his/her e-content and access those developed byothers.

5.11.2 e-Learning Research and Development

a) Education sector SHOULD support the online educator's use of researchto determine academic needs of students and successfule-Learning strategies.

i) A percentage of the institution's Research grants are given tosupport e-Learning research.

ii) Successful e-Learning research is recognized as an indicatorof the online educator's scholarship.

iii) Reviewed articles and publications related to e-Learning arerecognized as indicators of the online educator's scholarship.

iv) The MoES supports the online educator's innovation ine-Learning.

v) A national platform for exhibition and awards is madeavailable for the online educator to display and berecognized for his/her e-Learning innovation.

SECTION 6: STANDARDS AND GUIDELINES FOR ADOPTION AND DIFFUSION

6.0 Introduction

e-Learning adoption and diffusion among communities in the institutions is a long andchallenging process. Adoption and diffusion of e-Learning is a very important processin order to sustain effective teaching and learning practices within all levels of the institutions communities. It requires the enterprise wide commitment among the institutions communities. The proposed e-Learning Adoption and diffusion must be aligned with the requirement of Digital Agenda, National Plan and e-Learning strategy of the institution.

6.1 Strategic Planning

The section is mainly applicable to HEIs.

Strategic planning for e-Learning Adoption and diffusion MUST be in place in institutions where all proposed strategies in e-Learning Adoption MUST complywith the following characteristics:

6.1.1 Aligned - The strategic plan of e-Learning adoption and diffusion MUSTconform with the organizational goals.

6.1.2 Enterprisewide - Everyone in the organization MUST be included inthe strategic plan of e-Learning adoption and diffusion.

6.1.3 Continuous – Thestrategic plan ofe-Learningadoption and diffusion programme MUST be operational all the time.

6.1.4 Proactive - The strategic plan of e-Learning adoption and diffusion MUST useinnovative, preventive, and protective measures.

6.1.5 Validated - The strategic plan of e-Learning adoption and diffusion programMUST be reviewed and audited to ensure it achieves the stipulated objectives.

6.1.6 Formalized - The strategic plan of e-Learning adoption and diffusion MUSTinclude authority, responsibility and accountability.

6.2 Operationalization

The section is mainly applicable to HEIs.

6.2.1 The e-Learning adoption and diffusion related activities MUST be included

as part of the Key Performance Indicator (KPI) in the annualperformance appraisal.

6.2.2 Lecturers/Teachers/Instructors MUST be proactive in developing and using e-Learningresources effectively such as using appropriate and current teachingand learning technologies.

6.2.3 Institutions at all levels MUST provide regular training programmes for academic staff,supporting staff and students.

6.2.4 Institutionsat all levels MUST disseminate the policies, enterprise wide effectively withclear defined operational concept of e-Learning from time to time.

6.2.5 Institutions at all levels MUST allocate a specific budget from tuition fees for e-Learning adoption and diffusion program.

6.2.6 Each institution is encouraged to establish a dedicated e-Learning unit/ centre/representative at the faculty level with qualified e-Learningstaff to strengthen the implementation of e-Learning adoption and diffusion.

6.3 Awareness Raising and Implementation

The section is mainly applicable to HEIs.

6.3.1 The e-Learning adoption and diffusion activities aim to increase the awareness among communities.

6.3.2 All e-Learning adoption and diffusion activities SHOULD be coordinated bythe relevant center or unit at every institution.

6.3.3 Institutions at all levels SHOULD establish the special interest group on e-Learning adoption and diffusion to serve as a focus group and act as a catalyst to influence the institutions communities on e-Learning.

6.3.4 The annual e-Learning adoption and diffusion activity which comprises ofcarnival, seminars, workshops, exhibition, competitions etc. SHOULDbe organized in order to share some best practices and experiencesof e-Learning adoption and diffusion activities in teaching and learning.

6.3.5 The unit/centre related with e-Learning MUST create websites or anyonline medium (email, facebook, twitter, blog) to disseminate thelatest information on e-Learning.

6.3.6 The unit /centre MUST use social media tools to share activities andresources.

6.3.7 Institutions SHOULD organize awareness programmes by creatingpromotional items such as tagline, slogan, banner, bunting, logo,short film, booklet, etc.

6.3.8 The e-Learning adoption and diffusions champions COULD organize promotional shows to enlighten the institution communities.

6.3.9 The e-Learning adoption and diffusion week/month dedicated to e-Learning adoption and diffusion activities SHOULD be organized in all institutions.

6.3.10 The responsible unit in each institution SHOULD showcase e-Learning product, best practices and innovation through various platforms i.e.LMS, website etc.

6.3.11 Institutions SHOULD produce and disseminate publications on best practices on e-Learning, pedagogy and current technology whichhave to be shared by all academicians widely.

6.3.12 Institutions SHOULD encourage knowledge sharing on the awarenessand practice related to creative commons, pedagogy and currenttechnology.

6.4 Monitoring and Evaluation

The section is applicable to all levels.

6.4.1 Appropriate mechanism for monitoring of e-Learning activities andimprovements by the users/Heads of Department/Deans MUST be inplace.

6.4.2 Institutions at all levels SHOULD conduct self-assessment and evaluation of e-Learningpractices using the following instruments:

  a) Quantitative and qualitative survey
  b) Case study
  c) Comparative study
  d) Netnography (Social behavior of net citizens)
  e) Indicator index and benchmarking among peers

6.4.3 Inventory adequacycheck (IAC) fore-Learningadoption and diffusion activities at all levels in the institution SHOULD be established.

6.4.4 Each institution MUST provide a sustainable reviewing system (SRS) in orderto enhance the quality of e-Learning and this can be conducted byinternal and external assessors.

6.5 Recognition

The section is mainly applicable to HEIs.

6.5.1 All e-Learning activities SHOULD be recognized and used for careerpath advancement and promotion in the institution.

6.5.2 Institutions at all levels MUST recognize e-content published to be equivalent topublication based on the standard set by the MOES Digital Agenda.

6.5.3 All e-Learning activities SHOULD be included in the Student CenterLearning initiatives.

6.5.4 Institutions are encouraged to retain the excitement and motivation ofe-Learning culture through the recognition of e-Learning Champion(eLC).

6.5.5 Education sectorMUSTacknowledge e-Learningoutstandingparticipation(students and lecturers) in the form of certificates of merit, awards,

letters of appreciation etc.

6.6   Awards

The section is mainly applicable to HEIs.

6.6.1 Institutions at all levels SHOULD provide a number of monetary award for e-LearningChampion (eLC) for their outstanding involvement/ activities/innovation of e-Learning activities such as:

   a) e-content development
   b) e-Learning innovation
   c) open courseware (OCW)
   d) e-Learning movers

6.6.2 All eLCs at Education sector COULD be nominated for the national orinternational level award in e-Learning.

6.7 System Acquisition

The section is mainly applicable to HEIs.

Institutionsare encouraged to develop eLearning systems in-house in order to build local capacity and local content. Acquisition of systems SHOULD follow the procurement laws of the country. The following are guidelines for system acquisition for adoption for digital learning.

6.7.1 The platforms adopted or acquired must have the layout and navigational structure of content shells than can be customizable to meet teacher, learner, program, departmental, college, and/or institutional requirements.

6.7.2   The system MUST support the Global Learning Consortium's content package, Learning Tools interoperability (LTI) and Shareable Content Object

Reference Model (SCORM) standards for content import and export. The system MUST supportthe Web Content Accessibility Guidelines, the World Wide Web Consortium developed in order to make web content more accessible to people with disabilities.

6.7.3   Adopted systems must be able to integrate with the institution's enterprise student information system for content shell creation, content enrolment management, assessment submission and grading.

6.7.4   The system must be easy to use with less significant web browser configuration for end-users; affordable additional plug-ins and codecs.

6.7.5   The system must provide traditional and contemporary content item types, tools, and learning objects.

6.7.6   The system supports the integration of third-party teaching and learning plug-ins and APIs as well as academic integrity monitoring.

6.7.8   The system is enables identity and verification learners.

6.7.8   The system supports learning object repositories and centralized management of distributed content.

6.7.9   The system supports mobile devices for users participate in the content delivery process.

6.7.10   The system supports single sign-on Enterprise Resource Planning (ERP) systems and sub-systems.

6.7.11   The system provides functionality to share, collaborate, and manage learning objects.

6.7.12   The system can be kept current with the most recent security patches and updates.

6.7.13   The hosting infrastructure provides a system uptime of 99.99%.

6.7.14   System backups can be performed every 24 hours or less.

6.7.15   Data retrieval and/or restoration can occur within the institutionally defined recovery times.

6.7.16   System upgrades, bug fixes, etc. can be deployed and thoroughly verified in a test environment prior to deployment in the production environment.

6.7.17   Content and data deletion can follow institutional data retention policies.

6.7.18   Mechanisms for technical support for students, instructors, and staff is available 24/7 via phone, email, and/or chat are enabled.

6.7.18 A "frequently asked questions"/technical support knowledge base is made available online as part of the system.

6.7.19   Participation and availability of local IT support is considered in system development, implementation and support

6.7.20   Local content in terms system development and support be considered in the acquisition ofthe systems for T&L.

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ANNEXES

Annex 1: e-Content Recommended standards

Recommended Standard

- ✓ When designing e-content, delivery environment or device such display size, available screen area or resolution MUST be considered. Some user may choose to use content in a learning management system (LMS) which may have a fixed or reduced amount of available screen area due to the inclusion of the LMS interface. Sometimes user might select a content package player with similar but different constraints or might be a smartphone with a smaller resolution.
- ✓ Therefore web content SHOULD be scalable and designed to resize proportionally to fit the available area or resolution. This may be accomplished through a responsive or liquid layout that through the allocation of a percentage of space to each element results in images, text and spaces proportional to the display size.

• Web content (style and formatting)

- ✓ Recommended Standard: Cascading Style Sheet
- ✓ For examples CSS 2.1, is the recommended standard for content developed for cross-platform delivery.

• Text documents (fixed display)

- ✓ Recommended Standard: PDF or method of conveying information to meet WCAG 2.0
- ✓ For examples PDF, documents SHOULD be readable for instances Adobe Reader 9.0 and above. PDFs are not automatically accessible, but their accessibility can be improved if they arecorrectly tagged by the author. When used, PDFs SHOULD be made as accessible as possible.

• Text documents (editable)

- ✓ Recommended Standard: Compatibility pack that allows document editing, which are supported in other word processing packages.
- ✓ For examples RTF, DOCX or TXT file.
- • eBooks

✓ Recommended Standard: EPUB (short for electronic publication) is a free and open e-book standard by the International Digital Publishing Forum (IDPF). Files have the extension.epub.

• Spreadsheet formats

✓ Recommended Standard: Features that are supported in other spreadsheet packages.
✓ For Examples XLSX, which compatible with Microsoft Office & allows document editing in older Office versions.

• Presentation formats

✓ Recommended Standard: Features that are supported in other presentation packages.
✓ For Examples PowerPoint is a cross-platform compatible presentation application. Keynote and OpenOffice presentations may also be converted to a PowerPoint format to extend their interoperability.

• Web Graphics (non-animated)

✓ Recommended Standard: Graphic file that support more than 256 colours, and supports an alpha channel.
✓ For Examples GIF, JPEG and PNG. GIF is recommended for images comprising flat or solid areas of colour. JPEG is recommended for photographs and other images with smooth variations of colour (gradients). PNG is recommended for images with up to 256 colours, not requiring an alpha (transparent) channel.

• Audio formats
✓ Recommended Standard: Common audio format for consumer audio streaming or storage, as well as a factor standard of digital audio compression for the transfer and playback of music on most digital audio players.
✓ For Examples MP3. Content developers SHOULD maintain a balance between sound quality and the size of the MP3 file. Minimise the bit rate and sampling frequency where possible to ensure the MP3 file is not unnecessarily large.

• Video file formats

✓ Recommended Standard: Codec is recommended for broadest forward compatibility.
✓ For Examples MP4 which the delivery platform is the primary consideration in deciding the format of video content;

• Legacy mobile-specific formats

✓ Recommended Standard: to support developers of content whose audience utilises feature phone devices.

Annex 2: Copyright

a) Copyright
   Copyright is the exclusive right given to the owner for a specific period.
   An author's original work is automatically protected once it is fixed in any tangible medium, such as on a paper, video, audio, disk, computer memory, CD ROMs, etc. When an author/developer creates works under the conditions of the copyright, they will be exclusively entitled and eligible to do anything with regards to the work, for example, its reproduction, adaptation, dissemination to the public and the granting license to other persons to use the works.

b) Protection of Copyright
   The owner of a copyright has certain exclusive rights:
   - ✓ Reproduction is any mode of copying, emulation, duplication, block-making, sound recording, computer program, video recording or sound and video recording, from the original, a duplicate or a publication in its material part, and not being in the nature of making a new work, whether wholly or in part.
   - ✓ "Adaptation" is a reproduction by conversion, improvement, amendment or copying of the original in its material part, and not being in the nature of making a new work, whether wholly or in part.
   - ✓ Performing, showing or playing to the public.
   - ✓ Communication to the public.
   - ✓ Distribution of copies to the public by sale or other transfer of ownership.
   - ✓ Commercial rental to the public.

c) Fair Use of Copyright in Online Education

Copyright law allows portions of a copyrighted work to be used without the author's permission. This is referred to as "fair use". Normally, the fair use guidelines SHOULD provide the exceptions from infringement of copyright, if done as follows:

- ✓ research or study of the work, which is not done for making profit;

- ✓ report of current events through the mass media, accompanied by an acknowledgement of the copyright ownership in such work;
- ✓ reproduction, adaptation, exhibition or making available for judicial or administrative proceedings under the law, or for a report of the said proceedings;
- ✓ reproduction, adaptation, exhibition or making available by a teacher for teaching, which is not done for making profit;
- ✓ reproduction or adaptation of a part of such work, or abridging or making a summary by a teacher or educational institution for distributing or selling to students in the class or in an educational institution, provided that is not done for making profit;
- ✓ utilization of the work as a part of the examination questions and answers.

Basically, content on the Internet including the World Wide Web is copyrighted. It is a common misconception that everything on the Web is free. It is obvious that electronic documents on the Web and in other digital formats are easier to reproduce and distribute than other media. However, the ease of reproduction and distribution does not change the copyright status. For these reasons, the fair use limitations on digital media SHOULD be more stringent than fair use guidelines for other media

d) What Constitutes Copyright Infringement

The copyright in a work infringed when a person who, not being owner of the copyright, and without license from the owner, does or authorizes any of the following acts:

- ✓ reproduces in any material form, performs, shows or plays or distributes to the public.
- ✓ communicates by cable or broadcast of the whole work or a substantial part thereof either in its original or derivative form.
- ✓ imports any article into Malaysia for the purpose of trade or financial gains. • makes for sale or hire any infringing copy.
- ✓ sells, lets for hire or by way of trade, exposes or offers for sale or hire any infringing copy. • distributes infringing copies.
- ✓ possesses, otherwise than for his private and domestic use, any infringing copy; • by way of trade, exhibits in public any infringing copy;
- ✓ imports into Malaysia, otherwise than for his private and domestic use, an infringing copy;
- ✓ makes or has in his possession any contrivance used or intended to be used for the purpose of making infringing copies; or
- ✓ causes the work to be performed in public

e) Employment,

Copyright and Confidential Information Under the Act, the author is the first owner of any copyright, subject to the classic exception for employees. However, if the work is created during the course of employment, the employer owns the copyright. The question of copyright in universities, including teaching materials delivered over the internet it may make sense for the employer to assert ownership of the e-Learning materials produced by teachers and lecturers but

to grant them back a non-exclusive license to use the material in their teaching elsewhere. This way the employer gets to be able to adapt and reuse the materials they have paid for and the author is able to use their own materials elsewhere. All copyright issues arising from e-Learning contents developed by the lecturer SHOULD be referred to the Intellectual property Office of the university.

Annex 3: The Creative Commons License

All the licenses can be used with the understanding that:

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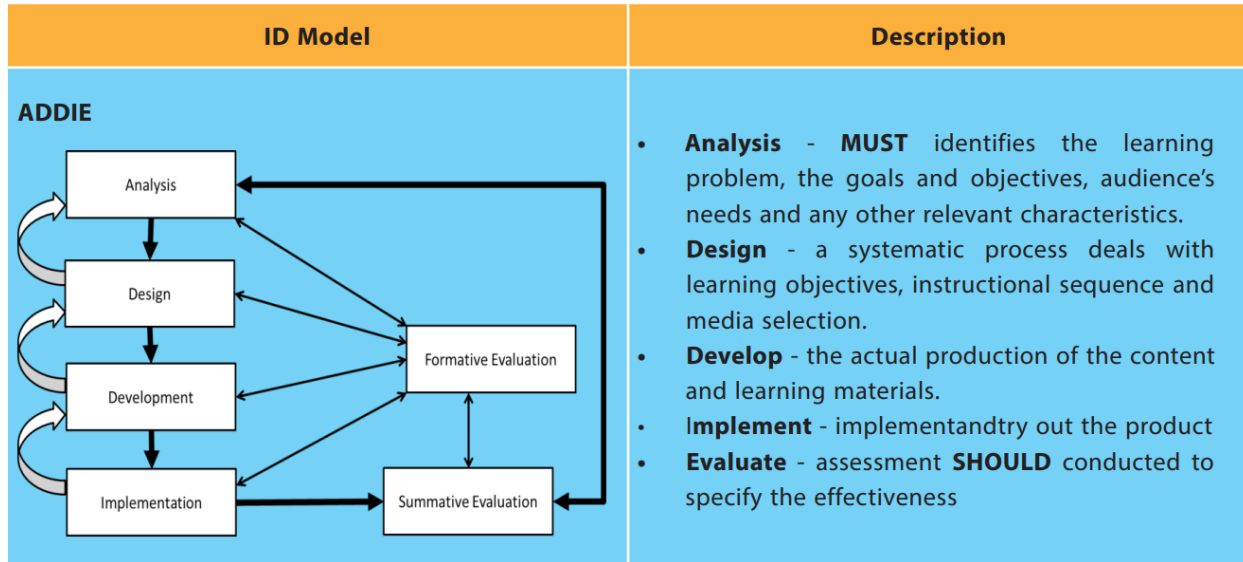|	
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Annex 4: Content Design Models
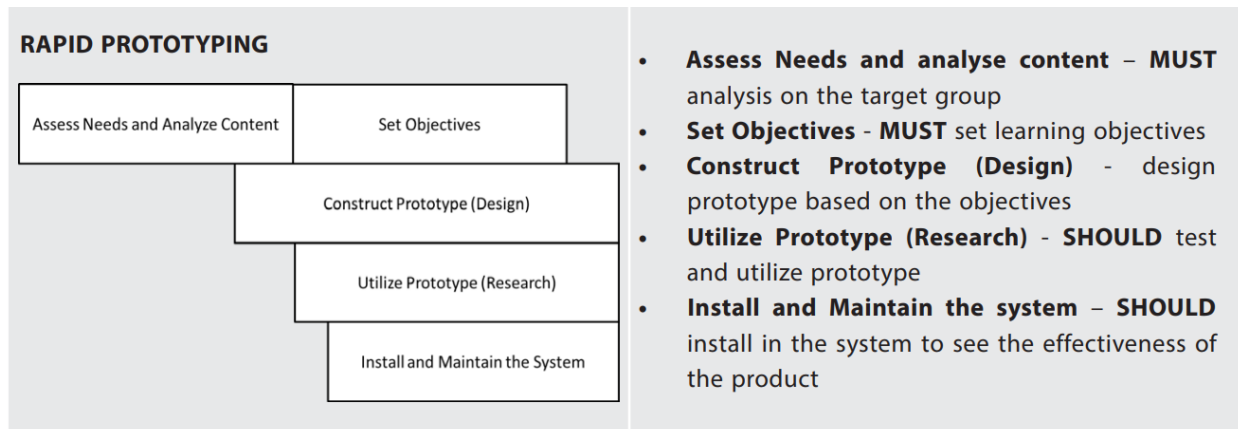
Detailed Procedure Involved In ADDIE Model

i. Analysis Phase
    a) Needs Assessment - to identify the goals for an instructional project. In doing so, we are trying to identify the gap between the desired goals and the current status.
    b) Audience analysis - helps us tailor the instruction to specific types learners.
    c) Content Analysis – defining the critical attributes of the given subject matter and also to identify whether any content exists that can be used whole, in part, or with modifications.
    d) Technical Analysis (course delivery and authoring tools) - to define upfront what the minimum requirements will be to participate in the course or training.

ii. Design Phase
    a) Identify Goals - goals assist in the creation of objectives and tell instructors what learners need to know, understand, or apply.
    b) Write learning objectives - objectives SHOULD describe the learner's expected level of performance by the end of the course.
    c) Identify entry behaviors- it is crucial to assess entry behaviours and to set appropriate pre-requisites. (d) Devise an instructional strategy - it is necessary to devise an appropriate instructional strategy to maximize the learning effectiveness.
    d) Create flowchart& storyboard - the flowchart and storyboard SHOULD include major course components such as main menu, modules, lessons, quizzes/tests, and any other elements used in the course

iii. Development Phase

    a) Authoring - start authoring the content.
    b) Media creation / integration / production - create the variety of media content that will support the objectives of each lesson.
    c) Prototyping - while all the previous phases SHOULD contribute to the effectiveness of the instruction, it is wise to test a prototype before full development.

iv. Implementation Phase
    a) The processes for this phase SHOULD vary based on the size of the user, the complexity of the e-content and the distribution of the materials.

v. Evaluation Phase
    a) First phase of evaluation (formative) – SHOULD look for ways to maximize development of future projects, or to enhance the current one.
    b) Second phase of evaluation (summative) - feedback from the user is analyzed to determine how well the implementation phase went
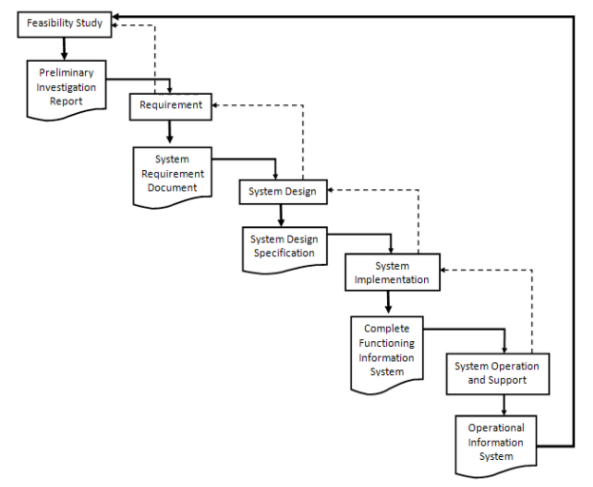
Annex 5: Instructional Design Models

i. ADDIE (Analysis, Design, Development and Implementation Model

ID Model	Description
ADDIE	• **Analysis** - **MUST** identifies the learning problem, the goals and objectives, audience's needs and any other relevant characteristics. • **Design** - a systematic process deals with learning objectives, instructional sequence and media selection. • **Develop** - the actual production of the content and learning materials. • **Implement** - implementandtry out the product • **Evaluate** - assessment **SHOULD** conducted to specify the effectiveness

ii. Rapid Prototyping Model

RAPID PROTOTYPING	
	• **Assess Needs and analyse content** – **MUST** analysis on the target group • **Set Objectives** - **MUST** set learning objectives • **Construct Prototype (Design)** - design prototype based on the objectives • **Utilize Prototype (Research)** - **SHOULD** test and utilize prototype • **Install and Maintain the system** – **SHOULD** install in the system to see the effectiveness of the product

iii. Waterfall Model

ID Model	Description
WATERFALL 	• **System requirements** – **MUST** setup the components to build the system, including hardware requirements, software tools, and other necessary components. • **Software requirements** - The analysis **MUST** be performed to determine the interaction with other applications and databases, performance requirements, user interface requirements, and so on. • **Architectural design** – **SHOULD** determine the software framework of a system to meet the specific requirements. • **Detailed design** - **SHOULD** examines the software components that defined in the architectural design stage and **MUST** produces a specification for how each component is implemented • **Coding** - **MUST** implements the detailed design specification • **Testing** – **MUST** determine whether the software meets the specified requirements and finds any errors present in the code. • **Maintenance** – **MUST** addresses problems and enhancement requests after the software releases.