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A. INTRODUCTION

Matthew Goniwe School of Leadership and Governance (MGSLG) as the Provincial Teacher Development Institute (PTDI) has a mandate from the Gauteng Department of Education (GDE) to provide capability building programmes and projects. The groups targeted for training include:

- Teachers and Teacher Aides
- Head Office and District Officials
- School Management Teams (SMTs)
- School Governing Bodies (SGBs)
- School – Based ICT Committees
- Representative Council for Learners (RCLs)
- Parents

In 2014 the province embarked on a project to introduce technology in the classroom. In the 21st century it is expected that South African teachers begin to enhance and extend their existing classroom practices by making use of ICT. This will enable them to make teaching more vibrant and learning more interesting. It will also enable learners to compete in the international arena because modern societies expect them to be able to think critically, solve problems and be creative. While the achievement of this expectation rests, first and foremost, upon the development of a highly qualified and committed teaching corpse (Darling-Hammond, 1995), Subject Advisors are versed with the responsibility of guiding this process. The expectation therefore is that the knowledge, skills, abilities, and commitments of Subject Advisors in this project that can assist and support teachers to shape and inform what is possible for the future generation of learners.

B. PURPOSE OF THE PROGRAMME

The programme aims at capacitating Subject Advisors to drive and support curriculum delivery through technology-based teaching in the classroom. In other words, their knowledge and role in the curriculum interpretation, delivery and assessment is the basis on which the technology must be utilised in supporting what happens in the classroom. Without this fundamental understanding, the use of digital technology in particular will remain trivial to the successful implementation of the curriculum. It is therefore important that Subject Advisors are well grounded in their understandings of their subjects in the context of the curriculum and how best they can be delivered in any learning context. Schulman (1986) describes theses understandings or knowledge domains as Pedagogical Content Knowledge (PCK). This programme aims at orienting and endorsing what Subject Advisors should do to perform their duties as curriculum specialists in this new digital space.

C. LEARNING OUTCOMES

The programme is intended to result in the following learning outcomes:

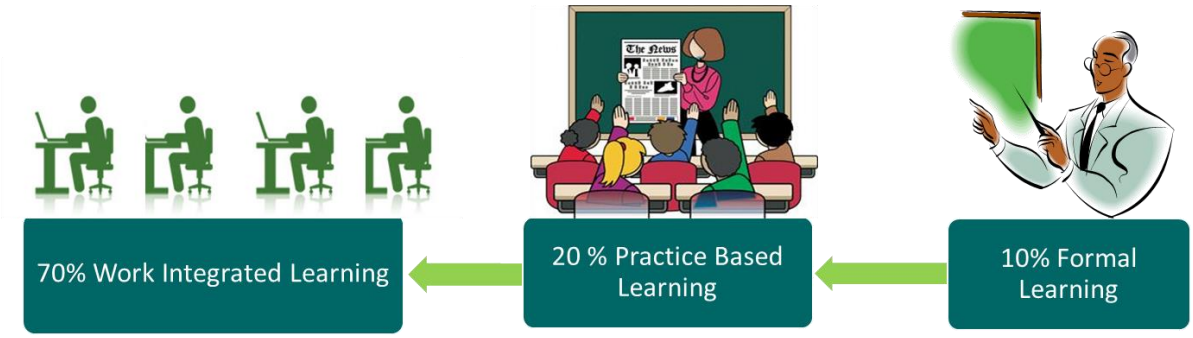
- Make clear what a curriculum specialist/subject advisor's role is in the context of Information and Communication Technology (ICT)
- Provide Knowledge, Skills and Attitudes needed to operate in a digital environment as a subject specialist

- Give guidance on how best to support teachers in their delivery of the curriculum through ICT

D. PROGRAMME DESIGN

The design is based on the need for MGSLG to develop material that can be used to train Subject Advisors so they can take a leading role in the integration of ICTs into subject teaching and learning. MGSLG has adopted the 10:20:70 model of training and support for all its programmes.

THE 10:20:70 FRAMEWORK FOR CONTINUOUS PROFESSIONAL TEACHER DEVELOPMENT



MGSLG uses the above framework for all its teacher professional development as an effort to promote continuous learning for its trainees. On the right hand side of the model above, the trainer presents the theory and this is where concepts are introduced and explained. Interaction at this level is encouraged to facilitate learning environments where learners actively participate in the learning experience. This should occupy 10% of the time allocated for the training. In the middle, is the practical part where learners actually practice what they have learnt in simulated or real life experiences? Lastly, the trainee adopts the knowledge and skills in their work environment and integrates these into their practice.

E. ASSESSMENT STRATEGY

A pre- and post-test approach has been developed to measure professional growth. Formative assessment tasks have been developed and will be conducted during the delivery of the programme.

Activities are relevant and customised for Subject Advisors in order to promote the acquisition of knowledge and skills for leading in the implementation of ICT integration into subject teaching and learning. Activities include individual, paired and group tasks. The summative assessment will be an e-portfolio that participants will be required to produce at the end of the programme as a product of their learning experience.

F. LEARNING MATERIALS

The materials consist of a Learner Participant Workbook (CD), relevant Legislative framework, The Learning Journey Matrix, Slides with facilitator notes.

G. SACE ENDORSEMENT OF THE PROGRAMME

The programme will be sent to the South African Council for Educators (SACE) for endorsement.

	MODULES/TOPICS	MODULES
1.	Introduction	Module 1
2.	What is ICT Pedagogical Integration?	Module 2
3.	The Theoretical Framework	Module 3
4.	Integrating e-content into subject teaching and learning	Module 4
5.	e-Assessment/ Automated Assessment	Module 5
6.	Managing an ICT classroom environment	Module 6
7.	How to support a teacher in a traditional and a digital classroom environment	Module 7
8.	Development of materials online	Module 8
9.	Professional Learning Communities (PLCs) with ICTs	Module 9

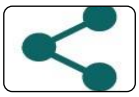
NOTIONAL HOURS

It carries **XXX** number of points. The notional hours are as follows:

	MODULES	CONTACT SESSION	ASSESSMENT	NOTIONAL HOURS
1.	**Module 1:** Introduction and orientation of Subject Advisors into their roles and responsibilities as curriculum specialists in a digital environment	1 day	Class activity	
2.	**Module 2:** What is ICT Pedagogical Integration?	1 day	Evaluation of an observed ICT lesson	
3.	**Module 3:** The Theoretical Framework	1 day	Application in subject area	
4.	**Module 4:** Integrating e-content into subject teaching and learning	1 day	Class activity – Peer assessment	

	MODULES	CONTACT SESSION	ASSESSMENT	NOTIONAL HOURS
5.	**Module 5:** e-Assessment/ Automated Assessment	1 day	Creation and evaluation of an assessment online	
6.	**Module 6:** Managing ICT classroom Environments	1 day	Class activity	
7.	**Module 7:** How to support a teacher in a traditional and a digital classroom environment	1 day	Steps and tools for supporting a teacher with an identified challenge with ICTs	
8.	**Module 8:** Development of materials online	1 day	A lesson developed on a learning management system of your choice	
9.	**Module 9:** Professional Learning Communities with ICTs	1 day	Evidence of participation in your subject PLC on social media	
	TOTAL NUMBER OF HOURS			

H. ICONS USED

	Writing Activity
	Discuss as a class, pairs or in a group
	Read
	For further reading
	Share your ideas with the class
	Use Slides to Present
	Use Google to search the Internet
	Reflections

	Take note
	Proudly South African

I. GLOSSARY OF TERMS

WORD/S	EXPLANATION
SMART/ Paperless Classrooms	Highly digitalized learning environments where learners use the internet, e-books or school network to learn

J. LIST OF ACRONYMS AND ABBREVIATIONS

GDE Gauteng Department of Education

HOD Head of Department

ICTs Information and Communications Technology

SGB School Governing Body

SMT Senior Management Team

MODULE 1: INTRODUCTION

1.1 INTRODUCTION

Information and Communication Technologies have proven to be a tool that has potential to improve efficiency in any sector, especially in the education arena. As you increase in the understanding of what a Subject Advisor is, your knowledge of the contribution of ICTs in delivering the curriculum will be concretised. This manual begins by explaining what a Subject Advisor is in the context of South African Education in order to meaningfully position the different elements covered in the programme.

Overall Aim of the module:

- To understand the key responsibilities of a Subject Advisor and to highlight the benefits of using ICTs to carry them out in the context of existing and relevant education policies.

Objectives:

- To make explicit the responsibilities of a Subject Advisor
- To draw ideas of supporting teachers by engaging with relevant education policies
- To indicate how ICTs can be used to perform Subject Advisor's duties

According to the Guidelines on the Organisation, Roles and Responsibilities of Education Districts (2011:24), Subject Advisors are curriculum specialists who are tasked with the duty of

- Informing schools about national and provincial policies, and assisting schools to implement them appropriately;
- Managing curriculum support including consultation with and advice to teachers, facilitating inclusive education and reporting on school visits;
- Promoting and organising provision of professional development of educators in co-operation with the South African Council for Educators (SACE); and
- Providing correct and timely Learner and Teacher Support Material (LTSM).

National Policy

The first bullet above is emphasised by the KZN Head of Department Dr Nkosinathi Sishi who describes the role of the Subject Advisors as critical as they "support teachers to make sense of the curriculum …, as they provide the interface between policy and practice" (Mail & Guardian Correspondent 20 June 2012). This view accentuates the importance of the knowledge of both national and provincial policies. The National Curriculum Statement, the CAPS document stipulates the goals for educating in any given classroom and you should not only know it, but interpret it appropriately in the context of your subject area.

ACTIVITY 1.1	
	The General aims of the South African Curriculum on Page 4 states: (a) The National Curriculum Statement Grades R-12 gives expression to the knowledge, skills and values worth learning in South African schools. This curriculum aims to ensure that children acquire and apply knowledge and skills in ways that are

ACTIVITY 1.1	
	meaningful to their own lives. In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives.
1. Highlight what you think are the key words in this first goal. 2. How would the words apply in your subject? 3. How can the use of digital technologies help in achieving this goal?	
	Share your ideas with your colleagues

	Before you visit any school, have a clear understanding of what each general aim means to the teaching and learning of your subject to ensure desired outcomes are inculcated in each experience.

As you already know, the National Education Policy has a number of supporting documents that are meant to make explicit the application of the curriculum in different contexts of its implementation.

ACTIVITY 1.2	
	Name at least 5 of some of these documents and discuss how, where and when they support the National Curriculum. If you have forgotten them, click 'RESOURCES' on the following URL http://www.education.gov.za/ to find them.
1. Highlight what you think are the key words in this first goal. 2. How would the words apply in your subject? 3. How can the use of digital technologies help in achieving this goal?	

a.

b.

c.

d.

e.

Some of these directly relate to your call of duty. Teachers in the Gauteng province now have access to digital technology and at most they have been trained on a 5 day programme on how to operate it. This training does not translate to using the tools effectively in the classroom. All that the course

covered was the 10:20 aspects of the training model MGSLG has adopted. The concern now is how they are using these devices to enhance teaching and learning. It is the last part of the model, the 70% that needs to be established.

ICT in Education Policy

When ICTs are used, they should enhance what is already happening in the classrooms (Ndlovu, 2015), otherwise they are of no value as they may be disruptive or a simple duplication of what has been in the traditional classroom. The Department of Basic Education has given guidelines on how these tools should be used in its supplementary document, The White Paper on e-Education (2004). This policy was developed to give guidance on how best ICTs can be used to enrich the curriculum. For instance, page 14 of this document states,

"e-Education is more than developing computer literacy and the skills necessary to operate various types of information and communication technologies. It is the ability to:

- *apply ICT skills to access, analyse, evaluate, integrate, present and communicate information;*
- *create knowledge and new information by adapting, applying, designing, inventing and authoring information; and*
- *function in a knowledge society by using appropriate technology and mastering communication and collaboration skills".*

The above statement makes clear why the 10:20 aspects of the training offered to teachers is not adequate for what is expected at the 70% stage of the model. Furthermore, the first bullet above makes clear that ICT skills should not only be used to access information, but to manipulate it in such a way that learners are able to make sense of issues, problems, etcetera through engaging in higher cognitive or higher levels in the Blooms Taxonomy. That probably justifies why reports from schools testify of limited adoption and adaptation of this new method of teaching with ICTs.

With the realisation of this gap, MGSLG contracted ICT facilitators, whom we often refer to as the e-90s, to support teachers in their attempt to apply ICTs as described in the first bullet. While the facilitators have trained on generic integration, that is not enough as specific subject and learner needs demand customised interventions. This is not a natural occurrence and for that reason, teachers need subject specialists to hold their hands as they implement this new method of teaching.

Before you support, observe and/or evaluate the integration of any teacher, ensure you are well grounded in the content and pedagogy of your subject. Priority should not be on technology, but the quality of teaching and learning.

The second bullet promotes what Oppenheimer, (1997) writes in his article, "The Computer Delusion" where he argues that computers should not just be used to collect information, but to help learners think and generate new forms of knowledge. If computer use is anything less than this, then we are severely underutilising them as they have potential to enrich any classroom experience regardless the quality or quantity of the available devices.

In the last bullet, emphasis is on the use of ICTs that provides learners with experiences that they will face in the real world. There are many examples of how ICTs can create a classroom experience that is

a replica of what happens in the world at different levels of schooling. The theory of Constructivism is a proponent of this way of using teaching resources in the classroom. Teachers therefore need guidance on how best they can construct learning environments that simulate authentic scenarios that learners can be exposed to as they prepare for work or corporate world. In his advocacy for relevance in ICT use, Kozma (2005:131) describes what you should guard against. He says,

> *There is no accounting for the effects of curriculum, pedagogy, teacher quality, or the use of ICT that might actually influence what it is that students know and are able to do as a result of their educational experience. And there is no connection between these components of the education system and the factors that influence economic growth and social development*.

In his em*phasis fo*r compliance, Kozma (2005:131) adds, "the details of these connections are very important to the educational policymakers who are charged with trying to prepare a workforce that is globally competitive and citizens who can participate in the knowledge economy and information society". This last statement highlights what you as a curriculum specialist should consider in your interpretation and implementation of the curriculum through ICTs.

The abilities enlisted in the White Paper on e-Education above resonates with bullet d) of the National Curriculum Statement that says,

(d) The National Curriculum Statement Grades R-12 aims to produce learners that are able to:

- identify and solve problems and make decisions using critical and creative thinking;
- work effectively as individuals and with others as members of a team;
- organise and manage themselves and their activities responsibly and effectively;
- collect, analyse, organise and critically evaluate information;
- communicate effectively using visual, symbolic and/or language skills in various modes;
- use science and technology effectively and critically showing responsibility towards the environment and the health of others; and
- demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.

You will notice that there are bullets highlighted in yellow in the extracts from the two policies. If you read them again, you will notice there is something common about them. The National Curriculum goal aims at producing a learner that is able to interact effectively using different modes. A digital device like a tablet or a computer has abilities (affordances) that provide these modes at any given time. On the other hand, The White Paper on e-Education makes explicit the importance of acquiring these skills. These two documents talk the same language and should be used together for relevant and valuable use of ICTs in the classroom.

We have discussed three national policies. The first one was the Guidelines on the Organisation, Roles and Responsibilities of Education Districts (2011:24) that enlisted your role as a curriculum specialist. According to the first bullet, you should be aware of provincial policies as well.

Provincial Policy

We will now look at the GDE ICT document called The Guidelines on the Management and Usage of ICTs in Public Schools in Gauteng (2011). This policy document provides guidance on how ICT activities in schools

should be managed in this province as a context. It might help to read it to familiarise yourself with what to expect in your school visits. This policy only covers 3 pages on the use of ICTs by teachers. The section on ICT usage by teachers and learners is drawn from the White Paper on e-Education and in that way, policy supplements the national ICT policy. To help understand the Gauteng context, a study reported in this policy document presents the following report of a study carried out in 10 schools:

School	Overall e-Readiness score %	Teacher usage of ICTs			
		Admin	Prep	Teaching	Learning
1	48	10%	26%	4%	25%
2	50	32%	26%	24%	26%
3	14	5%	3%	0%	0%
4	49	37%	23%	7%	2%
5	23	3%	9%	1%	1%
6	45	18%	19%	10%	18%
7	52	6%	22%	5%	4%
8	42	51%	21%	19%	14%
9	73	40%	25%	13%	16%
10	81	84%	57%	44%	33%
	Average for these 10 schools	28%	23%	13%	14%

This is evidence that then (not dated) ICT usage for teaching and learning were at lower levels in this province. However, six years after the publication of these results, changes have been made in the level of adoption especially in schools involved in the ICT project. What is of concern though is how these devices are used after training and onsite support offered in schools and some classrooms. Your role as a guide to the delivery of the curriculum through these digital devices is critical in ensuring teachers adopt the use of ICTs and when they do, teaching and learning is not disrupted but enhanced.

ACTIVITY 1.3

This activity aims at helping you see the relationship between the four national and provincial policies.

Use your role stated in the first bullet of the Guidelines on the Organisation, Roles and Responsibilities of Education Districts (2011) to demonstrate how you would assist teachers to implement aspects of the polices by populating the following table:

Policy 1 (Educ. Districts)	(N) Policy 2 (NCS)	(N) Policy 3 (ICT Policy)	P)Policy 4 (Provincial)
Assisting in the implementation of the curriculum	Your role? _____ _____	Your role? _____ _____	Your role? _____ _____

ACTIVITY 1.3			
	_____ _____	_____ _____	_____ _____

It is important that you are aware of what your role is in the implementation of all relevant policies in the context of your subject teaching. The rest of the responsibilities stated in the first document will be discussed in the next modules. At this stage, we will only elaborate on what they mean.

b) Managing curriculum support including consultation with and advice to teachers, facilitating inclusive education and reporting on school visits;

The image below decodes and thus simplifies this responsibility.

ACTIVITY 1.4

1. Based on your current experience, what else are you doing to manage curriculum support?
2. As a class, give examples of what you do in your subject area to apply each of the orange partitions
3. How can the use of ICTs alleviate these chores? ***This will be discussed later***.

c) *Promoting and organising provision of professional development of educators in co-operation with the South African Council for Educators (SACE); and*

In the first place, you need to know what SACE is and the services that it offers in support of the development of teachers' professionalism. It is important that you visit the SACE website at https://www.sace.org.za/ as there is a wealth of information you can use to develop yourself as a Subject Advisor and to refer your teachers to knowledge and programmes that can help them develop individually and professionally. The following image is from the Integrated Strategic Planning Framework for Teacher Education and Development in South Africa: 2011-2025 (2011:8) which is a

product of the 2009 Summit that resulted in a "Declaration that called for the development of a new, strengthened, integrated national Plan for teacher development in South Africa" (2011).

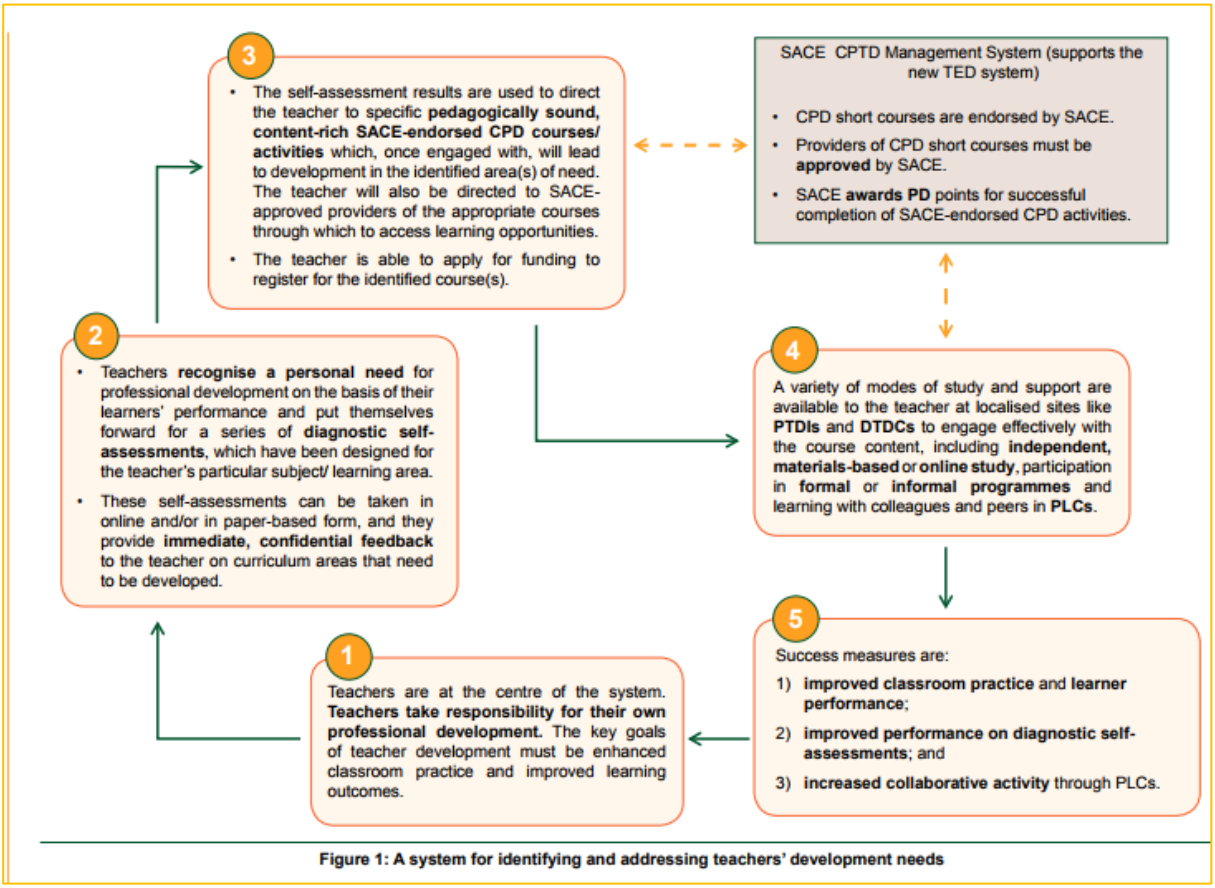
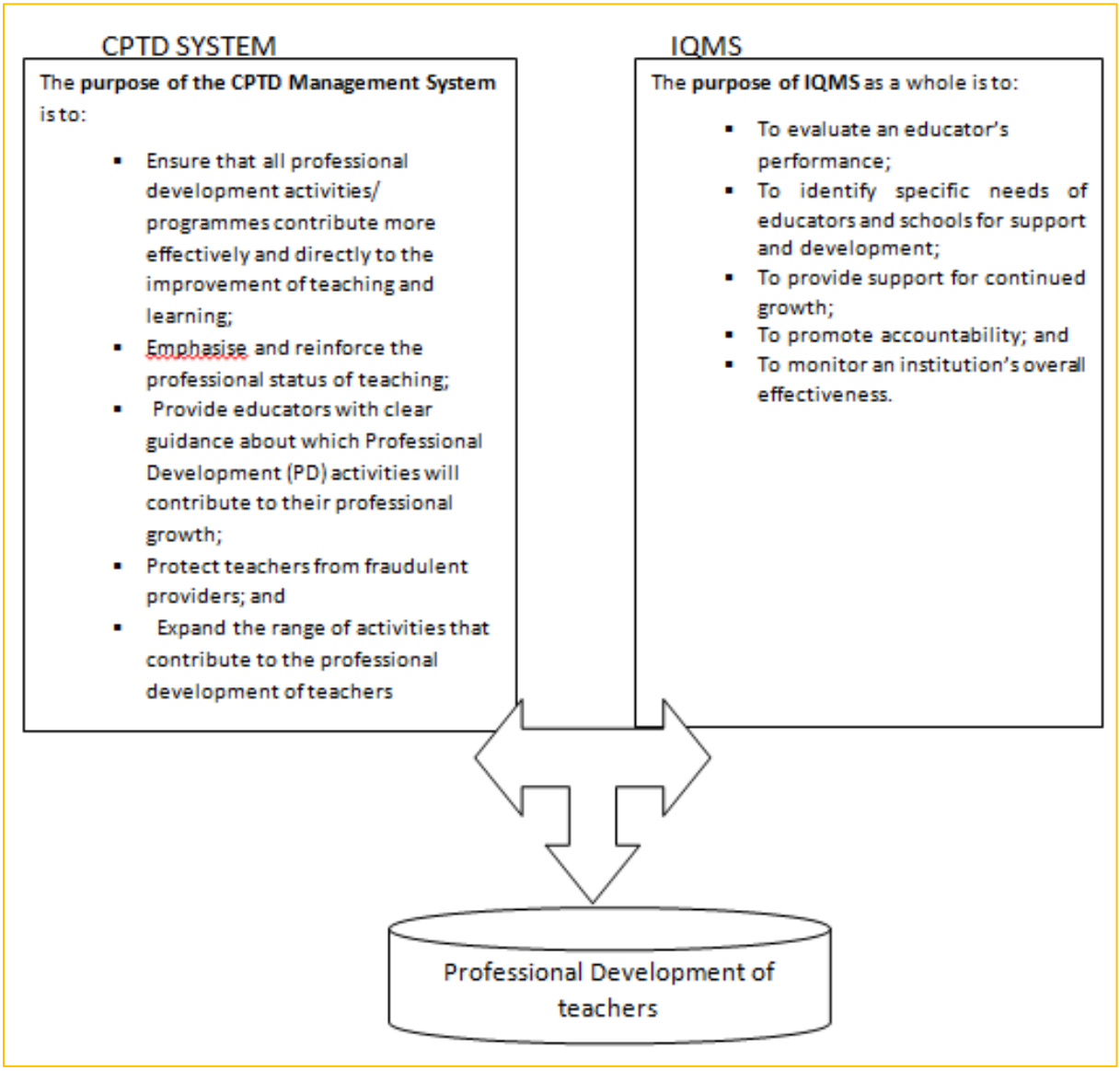


Figure 1: A system for identifying and addressing teachers' development needs

The image presents a process you can follow in your attempt to promote the professional development of teachers under your care. The SACE site also offers information and guidance on how the Integrated Quality Management System (IQMS) can be used to inform the Continuous Professional Teacher Development (CPTD). This model is accessed from the CPTD link on the menu on the SACE site that outlines the purpose of the two systems that should work together to promote teacher professional development.



While the internet provides a lot of tools and courses, some online, SACE stresses the importance of ensuring teachers participate in accredited programmes if they are to get points they need.

d) *Providing correct and timely Learner and Teacher Support Material (LTSM).*

Once teacher needs have been identified, support material need to be made available in order to create learning environments that are conducive and customised for the teaching contexts. To determine the correctness of the material your expertise as a subject content and delivery master is critical. While the advent of ICTs has made it easy to access a wide range of subject material, credibility and timeliness issues need to be addressed before you recommend or provide any resources. In cases where appropriate material cannot be found, it is incumbent that you as the subject specialist develop the material or at least workshop teachers on how to go about doing so. This is a quality that you will need as a curriculum specialist considering the GDE vision and statement that follow.

1.2 GDE VISION AND MISSION STATEMENT

1.2.1 Vision Statement:

Ensuring every learner feels valued and inspired in our innovative education system.

1.2.2 Mission Statement:

We are committed to provide functional and modern schools that enable quality teaching and learning to protect and promote the right of every learner to quality, equitable and relevant education.

1.2.3 Strategic Outcome Orientated Goals:

Goal 1: Deliver quality education in a conducive learning environment

Goal 2: Provide an administrative service that supports modern and innovative schools

Goal 3: Transform public schooling by addressing barriers to access, equity and redress

Goal 4: Increase access to quality pre- and post- schooling educational opportunities

This section is focused on matters of inclusion and it therefore calls for the development of customised interventions that ICTs are able to present in a click.

It is evident that in order to be relevant in this province, your ICT knowledge and skills are no longer a choice if equity and quality that the GDE is promoting will be achieved. This calls for modernisation of whatever system you use to perform your duties by,

a) Informing schools about national and provincial policies, and assisting schools to implement them appropriately;

b) Managing curriculum support including consultation with and advice to teachers, facilitating inclusive education and reporting on school visits;

c) Promoting and organising provision of professional development of educators in co-operation with the South African Council for Educators (SACE); and

d) Providing correct and timely Learner and Teacher Support Material (LTSM)

Activity 1.5 [e-Portfolio]

1. Think of that one teacher whose performance is low. You have done all you think it takes to support him or her and you seem not to be succeeding.

In this activity, you will be required to apply you knowledge of your 4 highlighted roles to support the teacher through ICTs.

MODULE 2: WHAT IS ICT PEDAGOGICAL INTEGRATION?

2.1 INTRODUCTION

ICT Integration is a concept that is often loosely used to refer to any use of digital technology into a work or learning experience. The word, 'integration' in this context means the technology is infused into the process or experience which can be administration work, teaching or learning in an education setting. The addition of 'pedagogy' to the notion makes all the difference. This Module will attempt to make clear what we mean by ICT Pedagogical Integration. This understanding is important especially for one vested with the responsibility of ensuring teaching and learning happens successfully in the classroom through ICTs.

Overall Aim:

- to understand what ICT Pedagogical integration is to an extent that it can be described explicitly

Objectives:

- to make explicit what it is that is being integrated
- to understand and describe how the integration takes place
- to relate acquired understandings about ICT pedagogical integration to teaching and learning
- to know how to apply these understandings to carry out Subject Advisors responsibilities

2.2 WHAT IS ICT AND WHAT IS IT INTEGRATED TO?

The White Paper on e-Education (2004:15) describes ICTs as "the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge". It is therefore all that constitutes digital technology. In the GDE schools and classrooms, ICTs would generally refer to laptops, tablets, interactive whiteboards (e.g. SMART Boards), printers, scanners, data projectors, memory sticks and external hard drives as hardware. Software would refer to SMART Notebook, Moodle (LMS) and various applications used to present and write materials. All the above can be referred to as digital technology. Technology is really anything you use to perform a task. There is however non-digital and digital technology. The focus here is digital technology.

What is key now is to know what each of these technologies can do for you as a Subject Advisor. What the technology is able to do is what we will refer to as affordances. The following activity should assist with that knowledge:

ACTIVITY 2.1			
	Technology	Affordance	What I can do with the technology
	Laptop		
	Tablet		
	Interactive Whiteboard		
	Printers		
	Scanners		
	Data projectors		
	Memory stick		
	Moodle		
	WhattsApp		
	Word Processor/ Word		
	Spreadsheet/ Excel		
	PowerPoint/ Presentation Software		
	Access		
	Publisher		

When you use these technologies to do your work, you are integrating it into what you are doing. What is of interest in this module is what we do when we integrate ICTs pedagogically. Before we engage in that, we need to understand what pedagogy is, as it is that which exists before the integration takes place.

Beetham and Sharpe (2013:2) describes pedagogy as "guidance-to-learn: learning in the context of teaching, and teaching that has learning as its goal". This view gives the image of a classroom where there are learners and a teacher guiding them in the learning process. Remember, learning takes place anywhere, any time and anyhow, but in this case, *the teacher is there, teaching to achieve a particular goal*. If that is so, what the teacher does in the learning environment determines what the outcome will be.

But, is it just the teacher that makes learning happen in the classroom? Respond to this question in the following activity.

ACTIVITY 2.2	
	Besides the teacher: 1. who makes learning happen in the classroom?
	2. What makes learning happen in the classroom?
	3. Share and justify your responses in class.

We hope you managed to capture all that makes learning happen in the classroom. While all contribute to what makes learning happen, the teacher plays the chief role in making sure all work towards ensuring this experience is successful. In other words, the teacher determines how the technology or whatever learning resource and the people in this process work together to achieve the desired outcome. Teachers speak when they explain, but words fail us at times when we try and describe concepts, especially those that are abstract and make up academic knowledge. It is for that reason that teachers will use gestures, pick up an object, drop or throw it to make their point. As the teachers do so, they are integrating the object into their speech to try and make clear the concept they are explaining.

How then can we best describe ICT pedagogical integration? Module 7 looks at what the teacher does in the classroom more closely as it describes the methods he or she uses to teach. Schulman (1986) affirms that teaching is a complex act and his observation is based on the fact that it involves a number of knowledge domains. It is important for you as a Subject Advisor to know these domains explained in Module 7 as they will enrich your evaluation of teacher practices. It is these knowledge domains that inform the quality of the teacher's performance in the classroom. The use of ICTs in a classroom where the teachers is well grounded in their teaching will increase the rate at which learning will take place. Try and make sense of the following image that attempts to make explicit what happens in the classroom.

This pedagogical process is guided by the teacher. The question now is what is represented by each dot? It is all that the teacher does in the classroom to make learning happen. When ICTs are used, they enrich this process. For example, if the teachers were to use a static image on a page as in the following image, learners can only imagine how the action takes place.

The challenge now might be that the teacher would have to explain the rest of what happens and through work, make learners imagine the detail. ICTs have affordances that will make explicit all that detail. An animated movement can be presented and stopped whenever the teachers wish to do so. That is the affordance of ICTs – something that a static page cannot do.

ICT pedagogical integration is therefore, “a process of using any ICT (including information resources on the web, multimedia programs in CD-ROMs, learning objects or other tools) to enhance student learning” (Williams in Wang and Woo (2007:149). That is, to enhance what the teacher does to make sure learning is happening. In other words, ICT integration should be of value to what happens in the classroom.

A South African study focussing on the value ICTs bring to teaching and learning was carried out in 2015 by Ndlovu, gave a sense of what happens in the classroom when these digital technologies are used. Seven descriptions emerged from the study which might give you different ways of how ICTs can be used in the classroom.

ACTIVITY 2.3 [e-Portfolio]	
	Read through the descriptions and write what you think the pedagogical value is in the use of digital technology. If you don't see any teaching and learning value, say and justify your response based on your understanding of what ICT integration is. On the last row, describe a lesson you observed.

Integration Type	Description	Value
Mechanical	Use is associated with mass production – ability to cover more content in a short space of time. Usage reduced to display on a platform.	
Convenience	Use is restricted to mobility of content (digital storage) and immediacy benefit or affordance. While teaching time is not wasted, the design of materials focuses on content structure and representation is in written text only. Delivery of material is rushed and shallow as focus is on going through the presentation.	
Insubstantial	Use does not relate to articulated perception on ICT benefits as it is restricted to static display of bullets that are used as cue words meant to help learners to remember.	
Process-oriented	Use is aimed at making explicit abstract subject processes to help learners concretise concepts.	
Partnership	Use is such that teacher and the digital device work together to enhance learner understanding.	
Teaching Champion	Use is restricted to chart-like display where the teacher refers to it when introducing a concept and carries on with a traditional method that is	

Integration Type	Description	Value
	dominated with talk, question and answer.	
Collective	Use brings a complex amalgamation of both digital and non-digital technologies and modes of texts that are driven by a need to bring to exhibit the different representations that are critical in understanding the subject.	
My observed ICT integrated lesson		

Adapted from Ndlovu (2015:280-281)

ACTIVITY 2.4	
	1. Share your evaluation of each of the ICT uses.
	2. As a class, determine what it is that should determine ICT use that is of value to the teaching and learning.

Before you evaluate the use of ICTs in the classroom, you need to have the following understandings:

- to be well grounded in your subject content – that which ICTs are integrated into
- to make explicit what it is that is being integrated
- to understand how the integration takes place
- to relate acquired understandings about ICT pedagogical integration to policy imperatives
- to know how to apply these understandings to carry out Subject Advisors responsibilities.

It is hoped that by the end of this course, you will have all the above understandings.

MODULE 3: THE THEORETICAL FRAMEWORK

3.1 INTRODUCTION

Teachers are agents through which the use of ICT for learning can help achieve our educational goals. There are different models and frameworks available that can help us understand what they need in order to effectively integrate ICTs into teaching and learning. This Module will focus on three of these models or frameworks with two developed globally and the other locally. The third framework will deal with change management in the context of ICT in education. In the ever changing global village with an ever evolving global economy, every country needs to align their education with the changes and this component should be included in interventions meant to promote change in the teaching practice.

Overall Aim:

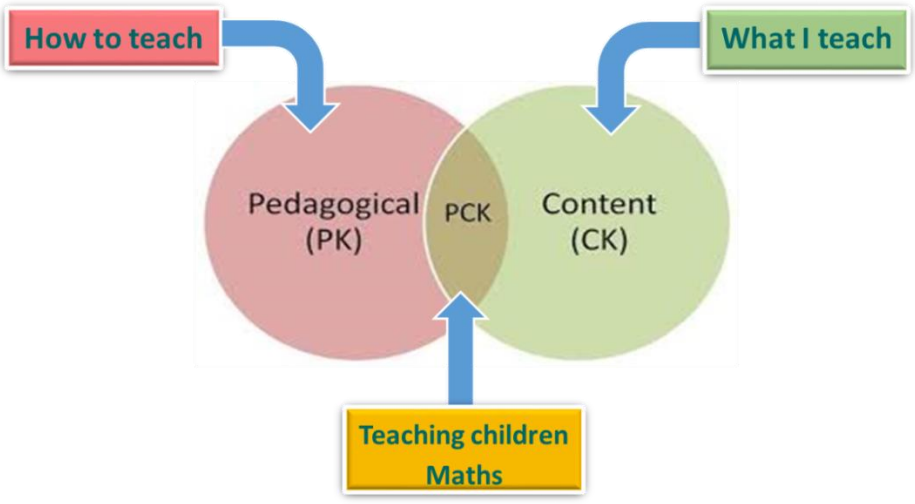
- to engage with selected frameworks that help in establishing our understanding of what ICT in education entails

Objectives:

- to understand the knowledge domains which teachers need to effectively integrate ICTs through TPACK
- to capture the key components that teachers need to integrate ICT in order to achieve curriculum goals through CoPAF
- to determine what teachers need as change agents
- to know how to apply these understandings to carry out Subject Advisor's responsibilities.

3.2 TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK)

In our understanding of what ICT pedagogical integration is, we were made to realise the importance of the role of the teacher in engineering the experience that brings about learning in any classroom. Schulman (1986) in his famous paper, 'Those Who Understand: Knowledge Growth in Teaching', describes the knowledge teachers have and use to teach. He refers to this as Pedagogical Content knowledge (PCK) illustrated and simplified below.



Schulman defines it as that which makes the learning of a topic easy or difficult. This includes,

> *for the most regularly taught topics in one's subject area, the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations-in a word, the ways of representing and formulating the subject that make it comprehensible to others.*
>
> *(Schulman, 1986:09)*

It is therefore all that you find in the pedagogical process illustrated in Module 2 page 22, which together produces either a successful or an unsuccessful learning experience. Our focus as Subject Advisers are supporting teachers such that they are able to 'manufacture' (for a lack of a better word) effective learning. The teacher should not only know his or her content, but should also know how to teach it in such a way that learners understand it well. Our curriculum statement's general aim (d) advocates for learners who are able to,

- identify and solve problems and make decisions using critical and creative thinking;
- work effectively as individuals and with others as members of a team;
- organise and manage themselves and their activities responsibly and effectively;
- collect, analyse, organise and critically evaluate information;
- communicate effectively using visual, symbolic and/or language skills in various modes;
- use science and technology effectively and critically showing responsibility towards the environment and the health of others; and
- demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation.

(DBE, 2011:04)

This demonstrates the level at which teaching must happen. Learner understanding should be such that their thinking is developed to a level where they can manipulate the knowledge and skills to solve problems. PCK should therefore enable the teacher to achieve this goal if successful learning has occurred. In-service teachers are supposed to have this knowledge and where it is not evident, us as Subject Experts or Subject Advisors should intervene.

Before intervention, the teacher's weakness must be identified. The easier way of doing so is by asking for the teacher's assessment sheets and if the learners' marks are low, this is interpreted as the teacher's inability to teach or a weak PCK. Engage in the next exercise:

ACTIVITY 3.1	
	As a class:
	1. Give as many reasons as you can for why a class could have low marks in a subject. 2. Which ones could relate to a weak PCK? Justify your reasons.

You must remember that a weak PCK does not translate to a weak Content Knowledge (CK) or Pedagogical Knowledge (PK), but can be a combination of both, Pedagogical Content Knowledge (PCK). Both knowledge domains should be at the desired level of PCK – that which the curriculum advocates for. What would be your response to the next activity?

ACTIVITY 3.2	
	In pairs:
	1. In a case where a teacher has low Content Knowledge, what do you normally do to assist? 2. When a teacher has low Pedagogical Knowledge, what do you normally do?

How we intervene as Subject Advisors varies, depending on the teacher, our preference, our subject structure, the school, etc. The truth is we can learn more by sharing what our intervention strategies are, regardless our contexts.

ACTIVITY 3.3	
	As a class:
	What makes you a proud South African is what you know, value and are able to do – that which makes you different from any other teacher in the world. As a South African teacher, what do you need to know (besides teaching methods) if teaching is to be successful (achieve curriculum goals)? Write this on the first page of your notes.

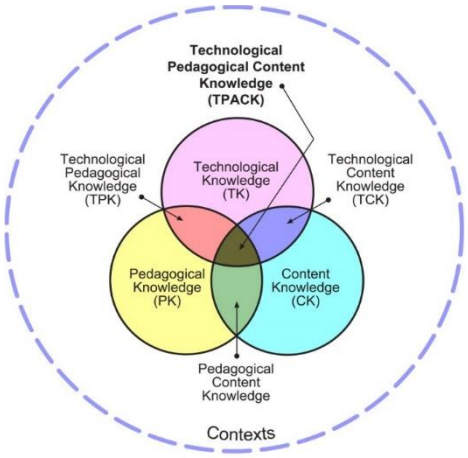
Whatever you have written contributes significantly to a successful learning experience. For instance, a teacher may have all the subject knowledge or teaching methods, but if learners are struggling with the Language of Teaching and learning (LoTL), all that effort is futile. I hope your engagement in the above exercise has made you aware that there are many possible reasons why learners do not perform well.

	It is important that when identifying teacher's challenges you diagnose correctly before you think of what interventions to implement.

ICT pedagogical integration is about enhancing the teaching learning experience so that curriculum goals are achieved. In Module 2, the emphasis was on making clear the integration is into something that is already taking place. PCK is that which should be taking place in the classroom. When we integrate ICTs or digital technologies, we are simply using these technologies to augment what the teacher is already doing when teaching. We all know that it is not easy to express what we know about academic knowledge in words as a good part of it is abstract. It is for that reason why Schulman (1986) gave examples of other technologies that together help to make teaching happen in the classroom. Teaching is so complex that even with all that, some learners still underperform. There are many

reasons that can be ascribed to that mishap. One of them could be that the teacher is not engaging them (technologies) appropriately or that the technologies do not have adequate affordances (abilities) to stimulate learning.

We will now focus on the later reason provided above. It is common knowledge that ICTs have a wide range of affordances that have potential to make teaching and learning more manageable and effective. In an attempt to make explicit the know-how of using these digital technologies in a teaching context, Koehler and Mishra (2005) use Shulman's concept of PCK to demonstrate the knowledge domain a teacher must have in order to pedagogically integrate ICTs effectively. The image below illustrates their idea.



You will notice Technology Knowledge has been added to PCK, shifting the teaching area to TPACK. This meant to make visible the presence of this powerful technology that has numerous affordances that can be used in any given teaching and learning experience. Like any technology, users, in this case teachers, need to have knowledge of how to use ICTs for teaching. Before they know how to, they need to know

1. what the technologies are
2. what affordances each has
3. to what extent these technologies can be used for educational purposes
4. why they would use them

Consider the description of ICT pedagogical integration offered in Module 2 when responding to the next activity.

ACTIVITY 3.4	
	1. Look at the 4 steps above 1) to 4) and rearrange them in such a way that the teacher is able to make decisions that are informed by educational reasons – reasons that will promote successful learning that can promote the achievement of curriculum goals.

ACTIVITY 3.4	
	2. Justify your reason for the new arrangement to the class. I hope you can agree on this one. If you do not, it is still okay. There is not only one answer to educational challenges.

Our next challenge as Subject Advisors is how we can intervene in a case where a teacher does not have Technological Knowledge when we as curriculum specialists do not have it. That simply means we cannot intervene. If we cannot intervene it means teaching and learning will continue to be compromised in all the Gauteng paperless classrooms we are responsible for and the result is the decline of performance by the province. If it is true that ICTs have the potential that the White Paper on Education (2004) claims it has, then we need to pull up our socks. We cannot afford to relax, more so that the technologies are slowly and surely saturating our work space. Besides GDE organised training, the SACE website and many others can help you register for courses that can provide you with competency skills you need. Better still, the internet provides different forms of tuition that you can access and participate in for free. The MG Online is freely accessible and its relevance to your role is that it provides you with information you will need to support teachers with ICT integration.

If possible, go through the whole MG Online course as fast as you can so you can offer meaningful support on ICT integration to your teachers online and face-to-face.

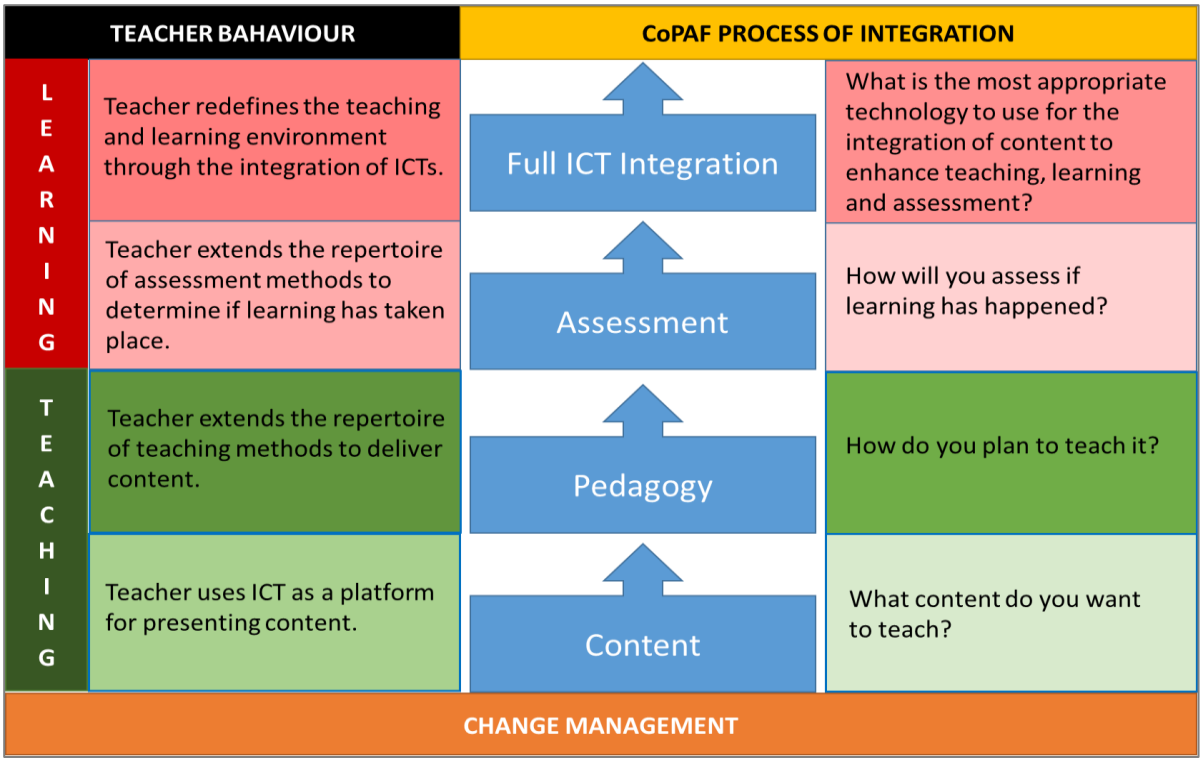
If you do you can identify ineffective integration and be able to assist your teachers with the TPACK they need to teach their subjects.

3.3 CoPAF

Teachers have gone through ICT training and a few of them have been proven to be adequate to prepare them to use these digital devices for teaching and learning. The Gauteng province has received similar reports after the training of its teachers. It is for that reason that Matthew Goniwe School of Leadership and Governance decided to develop a training model. The model is based on an attempt to:

- acknowledge all levels of TPACK or ICT integration
- ensure ICT trainings apply skills and knowledge needed for the use of digital technology in a complete teaching and learning experience.

The model was developed after observing the training of e-SSIP (Secondary School Improvement Project) offered by MGSLG. The aim of this training is to support teachers who have been identified as having challenges with PCK and as a result, their learners are underperforming. It is therefore important that this training tightens both CK and PK. With the influx of ICTs in Gauteng province schools, it became inevitable that this training be offered in a way that the two bullets above are captured. The model is illustrated below.



The model explains itself. To support teachers with CK, search engines and methods can be introduced to the teacher to identify different representations of the concepts which teachers are weak in. Providing instant access to information is the affordance of ICTs that can help enrich teachers' knowledge of their subject matter. At higher levels of proficiency, teachers would create their own content using both offline and online digital resources. E-books can be accessed from laptops and the SMART Boards available in schools.

To support teachers with pedagogy, online and offline resources and models can be accessed from digital technology. In a case where pedagogical knowledge is inadequate, the following link has 50 sites you can access for guidance https://teach4theheart.com/50-best-websites-for-teachers/. Most of these provide subject specific tips that your teachers might need. In fact, you can harvest some that might work for your teacher contexts. There are a number of local sites, like Mindset, that has content which is curriculum compliant.

Assessment is core in confirming successful teaching and learning. You know by now that there are different types of assessment. At the beginning of a learning experience, diagnostic assessments such as the following link for English can be accessed for free http://www.ef.com/test2/#/options and is handy in measuring learner prior knowledge. At a higher level, teachers can develop their own tests online using available assessment tools for different types of assessment

(e.g. formative or summative assessment). Clickers and many other online tools can be used for formative assessment. Such options provide teachers and learners with immediate feedback that they can use to modify teaching and lead to better performance.

Once the above three teaching components have been integrated, it is our belief that a teacher that has gone through this training will be able to make responsible decisions before and when using ICTs for teaching and learning. Full ICT integration at that level is achieved. It is important to note that integration at any of these levels would vary depending on the need to use them, proficiency or by choice.

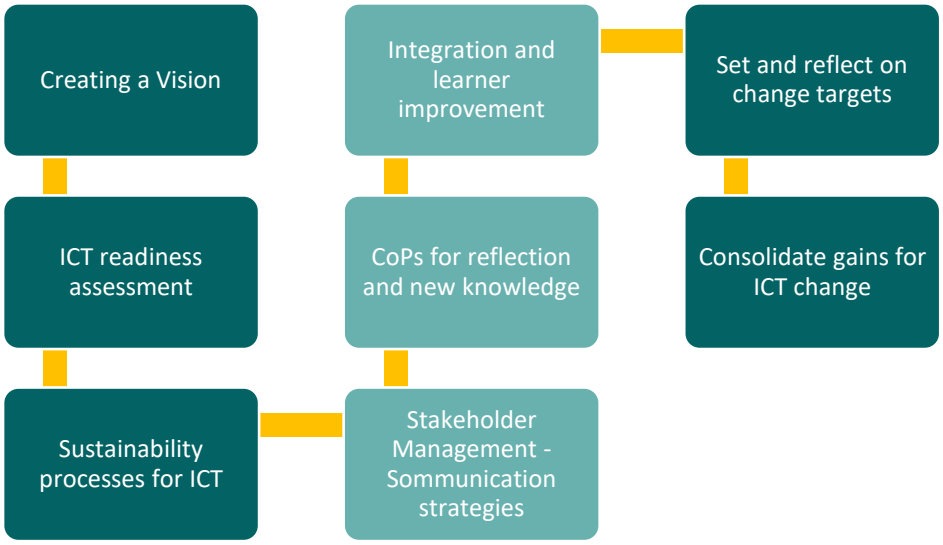
You must have noticed that the first two components of the model have a focus on teaching and the last two has learning on the left hand side. At content and pedagogy level the teacher is in charge and takes the position of a source and disseminator of subject matter. The third and fourth are at a level where the learner is evidently participating in their learning by giving feedback to the teacher through assessment. At the fourth level learners should be given new opportunities to engage with knowledge at higher thinking levels through digital technology.

CHANGE MANAGEMENT

While this training might be aimed at ensuring teachers begin integrating ICTs into their teaching it is important to think about those teachers who resist participating in this venture that has set this province as an exemplar in the implementation of digital technologies in schools. The bottom section on the CoPAF model focuses on teacher change management and will be dealt with separately in the next section.

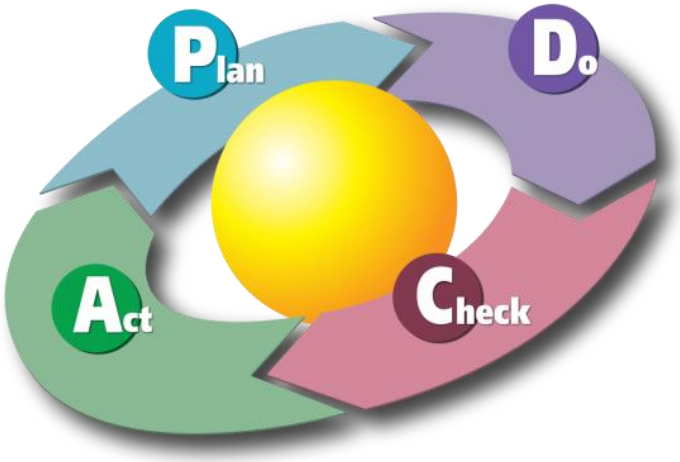
3.4 TEACHER CHANGE MANAGEMENT

Wikipedia describes change management as “a collective term for all approaches to preparing and supporting individuals, teams, and organizations in making organizational change”. Your work entails supporting teachers and where necessary, schools as organisations in the implementation of ICT integration. Think about where your role would fit into this Change Management model currently used in schools:



ACTIVITY 3.5	
	Discuss how and where you can intervene at teacher level to support the school as an organisation in its change management endeavours.

While there are many change management models that are used as guides to successful outcomes, we will use the PDCA Cycle coined by Deming. It is a repetitive four steps that can be used to control a progressive improvement of processes. In our case, enhancement of teaching and learning is what we should be managing. Look at the model and start thinking about what actions you can take to ensure your teachers implement ICTs effectively.



In the next activity, we will try and come up with ideas of how best we can plan for and maintain the development of teachers using ICTs to teach our subjects. It is important to know that the PDAC is a cycle and the advantage with this attribute is that it can be reviewed regularly as the teachers' performance is advanced through ICTs.

Our aim as Subject Advisors is to ensure there is advancement in the way teachers use ICTs in the classroom. In other words, as we support teachers in the use of ICTs in the classroom, learner performance improves.

ACTIVITY 3.6	
	As a class, work out the following:
	At a high level, how would you apply the PDAC to support teachers in the advancement of their integration of ICTs into their teaching?
Plan: _____ Do: _____ Act: _____ Check: _____	

The CoPAF model presents change management as the foundation for teachers' utilisation of ICTs in all parts of the model. The following model provides an example of how you can apply the PDAC model to support teachers in the 4 components of CoPAF at Plan level:

Full ICT Integration	•What do teachers need to create learning environments that develop higher levels of thinking •Identify literature and skills needed to advance teacher integration profeciency
Assessment	•Diagnose what feedback teachers need to address learning needs •Identify online assessment tools that can help respond to learning needs
Pedagogy	•Identify pedagogical elements each teacher is struggling with
Content	•Identify each teacher's weaknesses in subject matter •Identify websites with relevant content representations

The above are just examples of what you can have in your plans to support your teachers. Do your e-portfolio activity for Module 1.

As a change management agent for ICT pedagogical integration, you have no option but to be more knowledgeable about how best ICTs can be used to teach and learn so you can bring solutions to your teachers' classroom challenges through ICTs.

While Google Scholar might expose you to solutions at global level, you might have a solution in one of your teachers. Identify and use them to support other teachers.

Activity 3.7 [e-Portfolio]

Think of a specific teacher who is struggling with PCK. Give him or her pseudonym. Describe what exactly the challenge is with the teacher's Pedagogical Content Knowledge. State which area of change management you will focus on, bearing in mind their context. How can you help this teacher through using CoPAF as your framework?

MODULE 4: INTEGRATING E-CONTENT INTO SUBJECT TEACHING AND LEARNING

4.1 INTRODUCTION

Although there is abundance of electronic content available, there are challenges that relate to its availability. Knowing which material to choose is the first challenge as there should be justifications for the selection if it is the ideal solution for the teaching and learning solution. Secondly, how best to use the content for best effect, is the challenge that needs to be addressed. In this module we will focus on how best to broadly support teachers with integrating e-content into their teaching as we address the mentioned two challenges.

Overall Aim:

- to acquire expertise in supporting teachers in the identification and integration of e-content into subject teaching and learning

Objectives:

- to understand what e-content integration entails
- to know how to identify suitable e-content for teaching and learning needs
- to engage with examples of e-content and devise ways of integrating it into subject teaching and learning
- to know how to apply these understandings to carry out Subject Advisor's responsibilities

4.2 HOW TO INTEGRATE E-CONTENT INTO TEACHING

E-content is the different digital text modes that are designed and presented for learning purposes. They come in different forms. They can be digital books, articles, magazines, videos and other media forms. The presentation of e-content varies depending on the audience, learning outcomes or effects intended.

Module 2 introduced us to the five Media Forms: Narrative, Interactive, Communicative, Diverse and Productivity. Digital or e-books/MiEbooks would fall under Narrative media forms. Although access to them might be immediate, we cannot classify them under 'Interactive media forms' as the user cannot interact with the static content. Slides presented in written text with static images can also be classified as narrative media simply because the user cannot input or interact with the presentation. In other words, the user is on the consuming side and therefore moving from one page or slide to the other is linear. If so, it is just as good as reading content from a hard copy or a printed medium. When using such content, we can just as well stick to the methods we use when integrating textbooks or notes into our teaching.

ACTIVITY 4.1	
	Subject Group Discussion:
	1. When can teachers use books or slides to teach? 2. How do they use them?

It is important to accept that teaching is a conversation and through it as teachers, we are able to help learners learn new understandings. One of the weaknesses these conversations have is their failure to help learners actually see what we are talking about visually. We can make them visualise, but our success in that process is how well we describe what they are supposed to see. ICTs come in handy in such cases as we are able to actually click to provide them with real scenery of the event with movement, detail in images and sound. When we integrate these different modalities, we make explicit what we are describing or explaining. It is therefore important that the use of narrative text be non-linear.

4.2.1 Accessing e-Books

The server is loaded with e-Books, which take the place of textbooks. They are in Adobe Reader format.

4.2.2 Here are instructions on getting an e-Book from the server.

STEP 1	Make sure that you are logged onto the correct site on your school's Wi-Fi. If you cannot connect please ask for assistance from one of the 'techies'
STEP 2	Create a shortcut to the server. Do this as follows: On your desktop, right click and choose "New Shortcut"
STEP 3	Insert the correct IP address. It will look something like this - http://192.168.10.155 – but will differ for your school. ***Your Harry Gwala 'techie' or the ICT coordinator will be able to provide you with the correct IP address***
STEP 4	Click on "next", Name it "Train Your Brain" and click Finish
STEP 5	Now that you have created a Shortcut to the Portal Server, double click on the shortcut. Your Internet browser should open on Train Your Brain
STEP 6	If you have not registered before, you need to do it now. Please ask for help from the techies if needed. After registering, Log In with your Username and Password

You will practise accessing a textbook in the activity.

4.2.3 Accessing resources in the portal

Once you have logged in and accessed the portal, you will be able to access resources in the portal. You will be able to do this by following the steps below.

Note that we have used an example from science. This is just an example: there are lessons on most of the subjects and all of the grades. The process will be the same for whatever textbook you need to access though.

- At the top of the page go to resource library. Go into PORTAL
- Click on the 'Everything Science' Grade 10 textbook
- This will open a new 'TAB' with the textbook inside it
- Press and hold "CTRL" and press "S". Let go
- Choose a place to save the textbook
- Close the Internet browser
- Open the textbook by going to where you saved it and Double Click on it
- Make sure that it opens with Adobe. If it does not, ask the techies for assistance.

ACTIVITY 4.2

Accessing the Portal

Individually:

Confirm that you know your way around the portal by accessing a document. An example from a science textbook is given but you may use another if you wish. Follow the step by step instructions below.

Accessing an e-Book

1. First of all, register and then log in.
2. Then, follow the instructions below to complete this task:

Access the textbook relevant to your assigned task. (The textbook mentioned here is a science textbook.)

- In the textbook, go to page 9 - using the textbook for planning and notes
- Copy the text by highlighting it and either "Right click and copy" or "Press 'CRTL' and 'C'
- Open a word document
- Type your Surname at the top of the Word Document
- "Right click and paste" or "Press 'CRTL' and 'V'"
- Your text should now appear inside the word document
- Do the same with both the images on page 9 as you did with the text
- Add two of your own questions inside the word document

Save the word document. You may choose to email it to a colleague, to demonstrate that you are able to access documents on the portal.

4.3 USING PRESCRIBED E-CONTENT

Prescribed e-content comes in the form of memory devices in most cases and these can be memory sticks and CDs. Currently SMART Boards and teacher computers come with prescribed e-content, some in the form of e-books and slides teachers can use to teach. It is important for you and your teachers to know that while the material was designed by subject specialists, they need not undermine their classroom conversations and allow these forms of presentations to replace them. The prescribed e-content is there to enhance their teaching. What that means is, they should carry on teaching and bring in the content to enhance what they have been doing. In cases where slides are used, they obviously carry the core knowledge that needs to be learned and if it is static, remember that non-linearity is important. In addition to the classroom conversation, the teacher should bring in other teaching methods and resources to help make explicit what they are teaching. The following steps can be taken in this case:

Step 1	Step 2	Step 3
• First read extensively about the concept. • Summarise what you have read, highlighting what you consider key to the understanding of the concept 	• View the slides of the prescribed content and check if the key points are the same as yours • If they are not exactly the same - that is good 	• Think of ways of using the prescribed content together with yours to make connections and close gaps in the understanding of the concept • Use the prescribed content in class to make this learning experience more comprehensive and rich by highlighting and adding to extend learner understanding

4.4 ADAPTING E-CONTENT

In cases where e-content is structured in a way you (as the teacher this time) are struggling to understand, feel free to re-structure it. Remember whoever designed it is a person like you and they have expressed the way they understand the concept. If it is prescribed, just ensure you still capture the key points, but modify the presentation in a way you understand best. You might want to use the illustrations or images used to re-construct your presentations. Remember you know your learners

best and you know what will work for them. As a Subject Advisor, just ensure (as you check the materials) that they still capture the key concepts.

It is possible that some of your teachers might not be at a stage where they can adapt material. In such cases, *just make sure the teacher's classroom conversation is enriched by the content and not the other way around.*

4.5 E-LESSON PLANS

Matthew Goniwe School of Leadership and Governance has developed electronic lesson plans for teacher use in the classroom. These resources are meant to give ideas to teachers (especially inexperienced) on how to conceptualise and structure a lesson that is compliant to the curriculum. Our task now is to assist teachers to interpret and use these e-lessons in ways that can only enhance delivery of lessons. It is imperative that you as the Subject Advisor, go through these e-lesson plans and analyse them in such a way that you have a clear understanding of how best to mediate them to your teachers.

ACTIVITY 4.3

In Subject groups:.

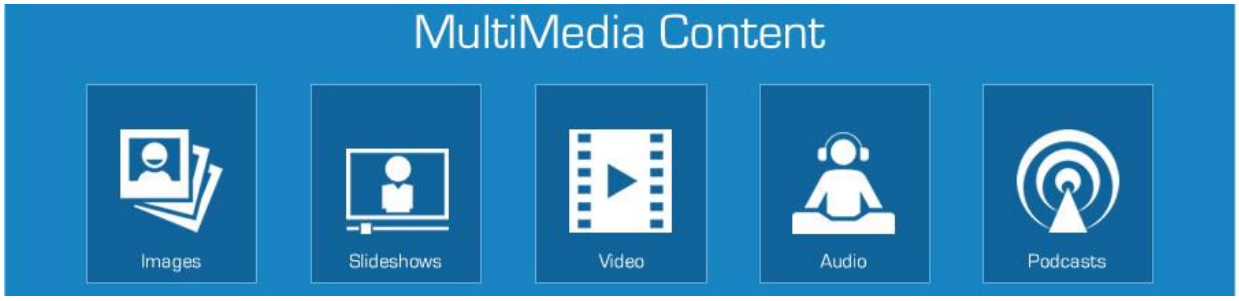
1. Select an e-lesson plan and respond to the following:
   - 1.1 Read through the plan and determine
     - 1.1.1 The usefulness of the plan to support specific teachers
     - 1.1.2 The adequacy of the resources and methods suggested.
   - 1.2 What ICTs can be used to supplement resources suggested? Give pedagogical or educational reasons for the choices you make.
     - 1.2.1 How can the ICTs best be used to enhance teaching?

   - 1.3 Agree on the teacher description you will mediate this plan to – consider TPACK
     - 1.3.1 How will you sell this e-lesson plan to the teacher – starting with their need?
     - 1.3.2 What approach will you use to demonstrate usage of the plan – you could demonstrate. Remember though that an explanation precedes a demonstration. You therefore have to make clear each section of the e-lesson plan and how it should be interpreted and applied effectively.

2. Select one person to present the processes you have gone through. The presenter will be expected to teach using the e-lesson plan.
3. The class must give comments on each other's presentation.

4.6 MULTIMEDIA

Wikipedia defines multimedia as "content that uses a combination of different content forms such as text, audio, images, animations, video and interactive content".



Such content is recommended in learning for its ability to help concretise concepts by providing learners with different representations of texts that bring to life or light in the learner's mind. While incorporation of the different media augments learning, it is important that it does not be used in such a way that it dominates teaching. In cases where it is already included in e-content, the teacher should go through it first in order to make decisions regarding when best they can be integrated into the teaching and learning and for what educational reason.

Where the teacher is developing their own material, there are design issues that need to be taken into consideration when presenting the material. The advantage though is that the designer has the privilege of making decisions on the layout and applying other design elements. Whatever is done it should be such that it is easy for learners to experience the effect intended.

4.7 MINDSET

This is a website with online resources that are CAPS compliant and are presented in different grades using multimodal texts. The following link will take you to the site:

ACTIVITY 4.4	
Google	Visit this site and select your subject and go through the material at different levels.
	Identify material you would recommend to a particular teacher in your school. Justify your selection of material to your class.

http://learn.mindset.co.za/resources/

There are a number of sites you can visit with access for free or pay. One such is Cyber School where you have to pay to access material that is CAPS compliant.

Identify at least 5 free sites with e-resources for your subject. Respond to your e-portfolio question on this Module.

ACTIVITY 4.5 [e-Portfolio]

1. Select an e-lesson plan of a topic your teachers are struggling with in your subject.

2. Modify it in a way that would help teachers make content taught more explicit.

3. Identify e-content that can help best explain the topic. This should include slides.

4. Embed multimedia on the slides

5. Identify at least 5 free sites with e-resources for this topic that you can recommend to teachers as additional resources and justify the benefits of using them.

MODULE 5: E-ASSESSMENT/ AUTOMATED ASSESSMENT

5.1 INTRODUCTION

Assessment is an important component of teaching and learning as it plays the role of testing waters before, during and after a learning experience. Once a teacher knows where his or her learner level of understanding is, teaching can be modified to suit inherent cognitive levels by so doing raising possibilities of successful learning. ICTs have affordances that can provide feedback immediately and by so doing making it possible to identify learner levels instantly, facilitating better opportunities for efficient teacher interventions to learning.

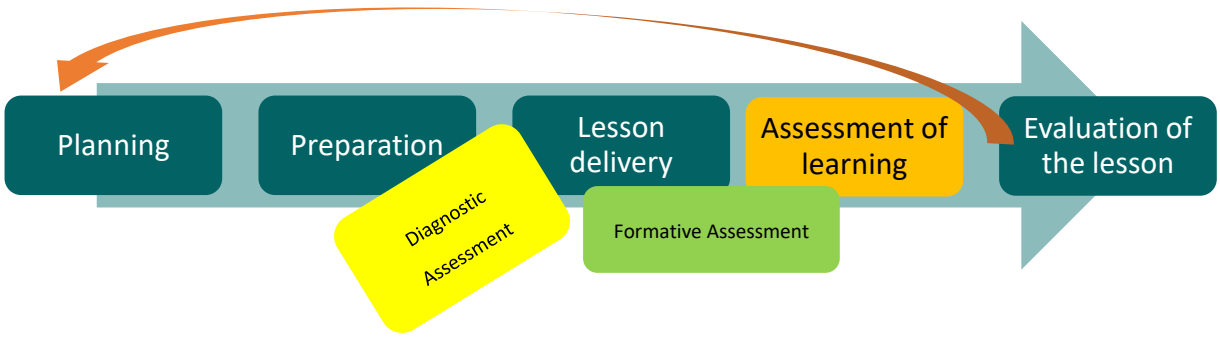
Overall Aim:

- to understand the benefits of e-assessment in teaching and learning

Objectives:

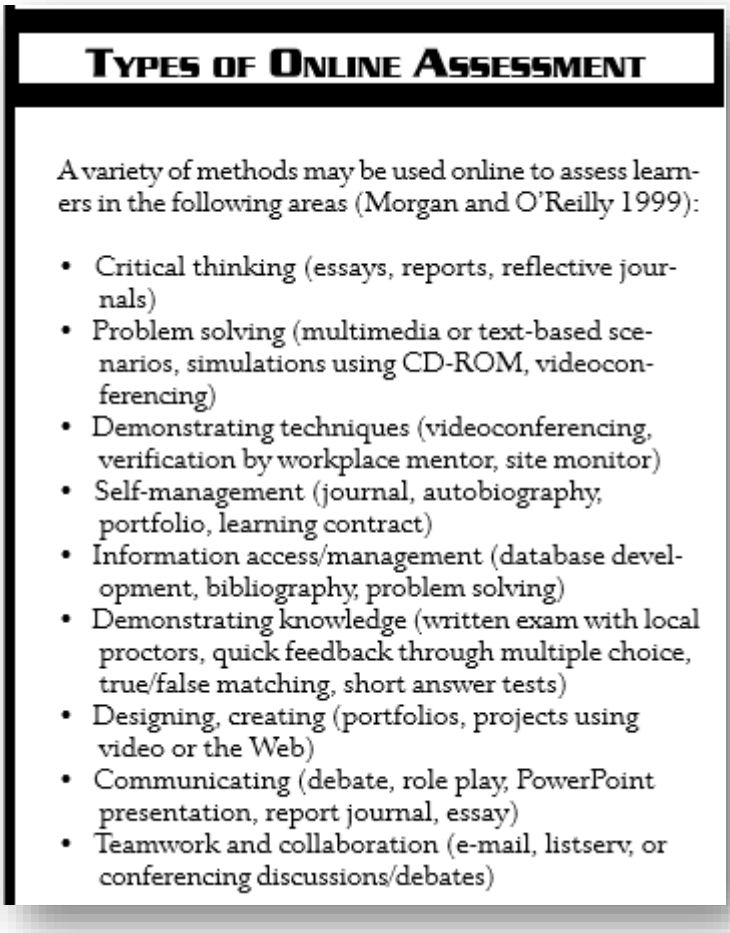
- to understand what e-assessment entails
- to identify suitable online assessment tools
- to meaningfully engage with online assessment tools
- to know how to apply these understandings to carry out Subject Advisor's responsibilities

Assessment of learning is usually the final phase of lesson delivery but in all honesty, it should happen before, during and then at the end of the lesson. E-Assessment is the use of digital technology or ICTs for different forms of assessment. ICTs can be used for diagnostic (before the lesson), formative (during the lesson) and in the end (summative) on the lesson. The main advantage of e-assessment is immediacy – depending on how it is designed and for what purpose. The information that follows provides general information on assessment, a new skill in setting multiple choice assessment questions and then introduces tools that can be used to track trends in assessment results.



5.2 TYPES OF ASSESSMENT

Which of the following types of assessment from ERIC/ACVE staff members Sandra Kerka and Michael E. Wonacott (2000) are you familiar with?



TYPES OF ONLINE ASSESSMENT

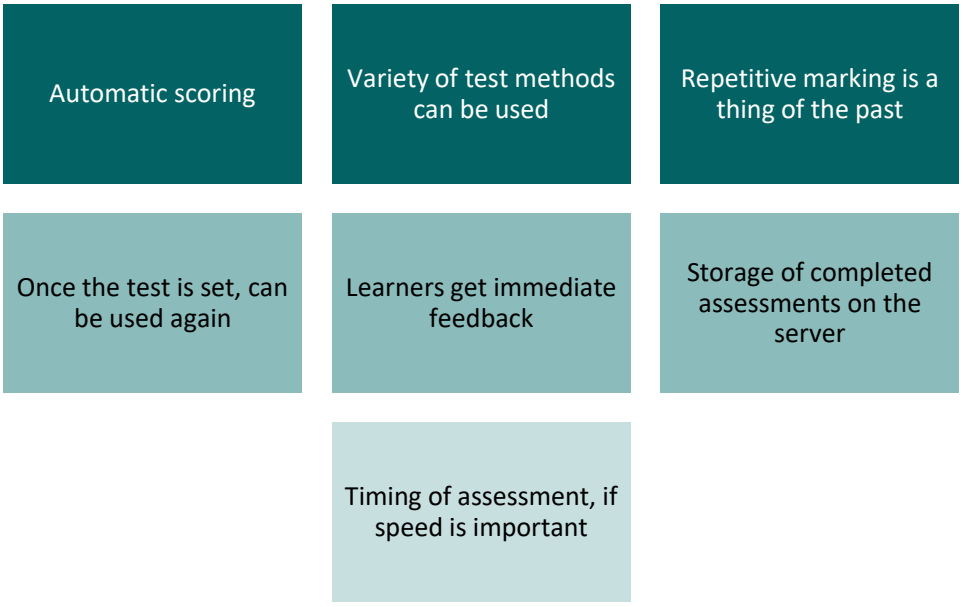
A variety of methods may be used online to assess learners in the following areas (Morgan and O'Reilly 1999):

- Critical thinking (essays, reports, reflective journals)
- Problem solving (multimedia or text-based scenarios, simulations using CD-ROM, videoconferencing)
- Demonstrating techniques (videoconferencing, verification by workplace mentor, site monitor)
- Self-management (journal, autobiography, portfolio, learning contract)
- Information access/management (database development, bibliography, problem solving)
- Demonstrating knowledge (written exam with local proctors, quick feedback through multiple choice, true/false matching, short answer tests)
- Designing, creating (portfolios, projects using video or the Web)
- Communicating (debate, role play, PowerPoint presentation, report journal, essay)
- Teamwork and collaboration (e-mail, listserv, or conferencing discussions/debates)

5.3 GENERAL INFORMATION ON e-ASSESSMENT

5.3.1 Advantages of ICTs when used for assessment

Some of the advantages of ICTs when used for assessment are:



5.4 ASSESSMENT TASKS SUITABLE FOR ICTS

A number of test formats can be set and used very effectively by the teacher. These include:

- indicate if an answer is 'true' or 'false'
- matching columns
- fill in the missing word
- drag and drop the correct answer
- circle or underline the correct answer or cross out the incorrect answer
- label a diagram or map
- add the missing information to a document (specific information, such as an address, etc.)
- enter data into a spreadsheet and
- multiple choice.

Note: ICTs can also be very useful for 'health check' or 'how am I feeling' mini-surveys, where the learner can indicate on a scale how well they think they are coping with a section of work.

We have decided to give you specific assistance with setting multiple choice questions as these are a little more complex than the other kinds of easily assessed tasks listed above.

5.5 ICT ASSESSMENT TASK PREPARATION

5.5.2 Assessment methods available on the portal

By working through the resource CD you learned how to access and use the selected portal. The applications that you learned there include:

How to create a quiz
How to add questions to a quiz
Add a matching column
Add a multiple choice question
Add short answer questions
Add true/false questions
How to edit quiz settings or edit a quiz
Hide/show quiz

As an advanced user, you should be performing all of these assessment tasks. The portal and its capabilities mean that you can select the settings that suit you – you can be in control of many aspects such as randomising questions, setting penalties for learners who attempt a quiz many times, being able to hide the quiz and so on.

5.5.3 Setting multiple choice test items

A very useful capability for teachers is being able to set multiple choice questions. Below you will find a careful guide on how to set good questions.

Put this together with the capabilities of the portal, and you will be able to assess learners accurately and get their results easily and quickly. This is the final step in lesson delivery – how you assess the learning achieved by the learners. You get an idea of how successfully you delivered the lesson, and how much your learners learned.

Note that the information on setting multiple choice questions was prepared by Professor Kuhn for the SSIP. It is used here by permission of MGSLG.

5.5.4 Definition

A multiple choice test item consists of the following:

- An incomplete statement (the *stem*)
- Four or five possible answers of which only one is correct and that is called the ***key***
- The incorrect answers are called *distractors*. They must be definitely but not obviously wrong
- The learner must choose the answer he or she regards as correct.

5.5.5 Criteria

The following criteria should be adhered to when setting multiple choice test items:

STEM	• Must be clearly formulated • Avoid giving grammatical clues in the stem • The stem and possible answers should flow grammatically • Should contain as much of the wording as possible
ANSWERS	• Only one correct answer • Incorrect answers should be plausible • There should be 3-5 options
AVOID	• Do not use the option "none of the above" • Do not use the option "all of the above" • Do not write a question in the negative (E.g. Which of the following is NOT ...)

Source: Kühn. 2014

5.5.6 The process of setting multiple choice questions

The information below provides guidance in setting multiple choice questions for assessment. These are based on a short piece of information so that you can see very clearly how the questions are devised.

ANIMALS AND US	
Why do people love watching the monkeys in the zoo? Do we perhaps laugh because we recognise ourselves in them? Man is himself an animal, after all, and some animals can be all too human.	1
Have you ever wondered what our *pets* think when they watch *us*? Do they see us as humans, or do they, perhaps, regard us as big cats or dogs or canaries?	2
Take cats, for instance. They say that the relationship of the human to the domestic cat is that of the mother cat to the kitten. When a cat is hungry, it rubs up against the legs of its owner, like in the wild, thirsty kittens rub up against the mother's legs to get her to lie down and nurse.	3
Wild dogs, unlike the wild cats that hunt alone, are pack animals. They like to follow a strong leader. The domesticated dog seems to take his owner as the pack leader rather than as a mother, and if allowed, will follow him everywhere	4
Tame animals are followers, not leaders. In the wild, however, many animals reveal great responsibility, particularly when it comes to education their young.	5
Foxes go to much trouble to educate their cubs. The father plays with them, teaching them how to co-ordinate their muscles and senses. The mother makes them jump to "catch" food from her mouth while moving her head up and down. Later she takes them hunting and shows them how to make a kill.	6
Hippo mothers are very caring. When foraging for food, they leave their babies in the care of a "baby-sitter" to enable them to find food on their own.	7
Unfortunately, not all animals are good parents. Some species neglect their young. In this, too, animals seem all too human.	8

Source: Kühn, Meiring, Scheffler, Marais and Oosthuizen, English in Action, Second Language Grade 8, 1996.

5.5.7 Hints

- Choose the distractors carefully so that they will appear correct to candidates who do not have the knowledge to answer the question correctly. Include the mistakes you know the weaker learners are likely to make.
- Resist the temptation to describe the correct answer better and in more detail than the distractors. Answers should be more or less the same length.

5.5.8 Examples

Multiple choice test item

The writer tells us that the hippo mother leaves her baby in the care of a "baby-sitter" to prove that hippos:

(a) want to be alone sometimes

(b) need help in the education of their young

(c) want their babies to learn to fend for themselves

(d) do not love their babies

(e) are responsible animals caring for their young

5.5.9 Stem containing as much of the wording as possible

Poor

"In this, too, unfortunately, animals seem all too human."

The writer

(a) implies that humans are better than animals

(b) suggests that humans are not such good parents as animals

(c) thinks that some people neglect their children

(d) suggests that humans do not care for their offspring

Acceptable

"In this, too, unfortunately, animals seem all too human."

The writer implies that

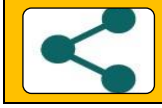
(a) humans are better than animals

(b) humans are not as good parents as animals

(c) some people neglect their children

(d) humans do not care for their offspring

Source: Kühn. 2014.

Activity 5.1 [e-Portfolio]	
	Setting a multiple choice quiz
Individually: A. Select an online assessment tool from the following link https://www.teachthought.com/technology/26-teacher-tools-to-create-online-assessments/ and Powerpoint 1. Set a multiple choice quiz for a diagnostic assessment for a topic or concept in your subject (5 questions). Explain how the assessment will help prepare for the next lesson. B. Use the attached webquest template to create a project-based activity in your subject. Explain what learning outcome you want to achieve through this activity.	
	2. Share your test with colleagues in the next session

5.6 ASSESSMENT ANALYSIS CAPABILITIES

5.6.10 ICTs, data and assessment

ICTs can be most useful in many ways for the teacher, besides in the presentation of lessons, sourcing content or administrative tasks. We present three assessment tools that can be applied in order to determine the extent to which data (through the use of ICTs) can be used to support and ultimately extend the quality and effectiveness of assessment practices in the school. The tools are presented below, along with an explanation of how and why it could be used. The three tools are for:

- teachers collecting and analysing data on learner achievement
- learners looking at their own data and
- teachers tracking assessment.

Using ICTs and data collected in this way is a capability of users at the advanced level of usage.

Activity 5.2 [Optional]	
	Surveying and selecting a method
	In groups: 1. Each group study one of the data and assessment tools provided below. In your discussion: • clarify what the tool is for

- how it can and should be used
- the benefits of the tool for you as a teacher, as well as
- its application in your teaching.

2. Explain the tool and its use to the other groups.
3. Together decide which tools you would like to use.

5.7 TOOL 1: USING DATA ON LEARNER ACHIEVEMENT

5.7.11 How to use this tool

5.7.12 Understanding the categories

EXPLAINING THE LEVELS				
LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Unsatisfactory	Poor	Satisfactory	Good	Excellent

EXPLAINING THE COLOUR CODING			
RED	**AMBER**	**GREEN**	**BLUE**
Non- compliant, emergency measures needed	Some efforts being made, but a more coordinated, inclusive and strategic approach is needed	Satisfactory, but there is room for improvement	Good, encourage the school to maintain this level and quality of engagement

CONCEPT	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
LEARNER DATA		No regular review of learner data takes place	Only provincial test results are used to monitor learner achievement; data are analysed annually against annual results	Only provincial test results are used to monitor learner achievement; data for the past three years are analysed	Multiple sources of data on learner achievement are analysed, including formative and summative assessment. Progress of learner cohorts is monitored
DEMOGRAPHIC DATA	Only data required by the DBE or GDE is collected and reported on	Only data required by the province (e.g. attendance) are collected, reported and analysed at the school	Data other than on learner achievement are used to guide decision making	Data other than on learner achievement are used to guide decision making. This includes quantitative data as well as qualitative data gathered from learners	Many types of data are gathered. Secondary schools look at post school data such as admission to HEIs, success rates, remediation and completion of course
STAFF DATA		Only data required by the province (e.g. teacher qualifications) are verified at the district; no data re staff are used at the school level	Data about staff include objective (qualitative) information that is used to plan professional development and CPD	Both qualitative and quantitative data are gathered about staff	Both qualitative and quantitative data are gathered about staff. This information includes teacher preparation and preparedness, learning and staff needs
PARENTS AND THE COMMUNITY	Data about parents and the community are not used by the	Data on parental involvement at the school are collected	Data on parental involvement and	Both qualitative and quantitative data are gathered	Both qualitative and quantitative data are gathered and parents/

	school for decision making purposes		community characteristics are compiled		community help to analyse and interpret the data
DATA COLLECTION, STORAGE, RETRIEVAL AND ACCESSIBILITY		School data from a number of sources is not organised in a single location	School data are gathered and stored	School data are gathered, and are available on request	School data are summarised, displayed and accessible

5.7.13 Who must do what?

ROLE PLAYER	TEACHERS	SMT	DISTRICT OFFICIAL/CURRICULUM SPECIALIST
Preparatory task	Discuss the use of data on learner achievement and indicate current performance.	Review the information provided by teachers.	Ask the school to complete the analysis and provide the responses in the Subject Improvement Plan and School Improvement Plan. Analyse the responses.
Intervention	Mark as priorities for action in the Subject Improvement Plan.	In priorities for action in the Subject Improvement Plan.	Plan the intervention based on the responses provided and your own analysis. Set incremental targets for improvement and explain both what and how the school can reach these targets. Turn the 'standard' for the next level into an action to undertake and a target to strive for.

Follow up	Implement the steps that will lead to improvement	Support and monitor the implementation of the actions required	Having set a date for implementation, plan to visit the school to review implementation and offer further support and assistance.

5.7.14 What documents must this be linked to?

The Subject Improvement Plan; The School Improvement Plan (SIP); the performance dashboard; the data warehouse.

Adapted by Intelesi: Holcomb, Edie, Data Dynamics

5.8 TOOL 2: LEARNER ENGAGEMENT WITH THEIR OWN DATA

5.8.15 How to use this tool

5.8.16 Understanding the categories

EXPLAINING THE LEVELS				
LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Unsatisfactory	Poor	Satisfactory	Good	Excellent

EXPLAINING THE COLOUR CODING			
RED	**AMBER**	**GREEN**	**BLUE**

Non- compliant, emergency measures needed	Some efforts being made, but a more coordinated, inclusive and strategic approach is needed	Satisfactory, but there is room for improvement	Good, encourage the school to maintain this level and quality of engagement

CONCEPT	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
Benchmarks	Most essential benchmarks are not identified or are available only to teachers	Most essential benchmarks are written in learner friendly language and are provided to learners and to parents	Learners rely on letter grades to know how they are doing	Feedback is provided to learners in terms of status and progress against benchmarks	Learners understand scoring guides and engage in peer and self-assessment
Learner engagement with data	Learners state what they are doing in class, not what they are learning	Learners state what they are learning	Learners state what they are learning and can show how they are keeping track of their progress	Learners describe their current status, goals, and what they need to do to accomplish proficiency	Learners lead conferences with teachers and parents and describe progress, goals and plans
Celebrations	n/a	Teachers do not openly model a focus on progress/growth	Teachers do not design celebrations	Teachers design celebrations when class goals are met	Teachers and learners design celebrations of incremental progress of both individuals and of groups

5.8.17 Who must do what?

ROLE PLAYER	TEACHERS	SMT	DISTRICT OFFICIAL/ CURRICULUM SPECIALIST
Preparatory task	Discuss the use of data by learners, parents and themselves	Review the information provided by teachers	Ask the school to complete the analysis and provide the responses in the Subject Improvement Plan and School Improvement Plan Analyse the responses
Intervention	Mark as priorities for action in the Subject Improvement Plan	In priorities for action in the Subject Improvement Plan	Plan the intervention based on the responses provided and your own analysis Set incremental targets for improvement and explain both what and how the school can reach these targets Turn the 'standard' for the next level into an action to undertake and a target to strive for
Follow up	Implement the steps that will lead to improvement	Support and monitor the implementation of the actions required	Having set a date for implementation, plan to visit the school to review implementation and offer further support and assistance

5.8.18 What documents must this be linked to?

The Subject Improvement Plan; The School Improvement Plan (SIP); the performance dashboard; the data warehouse.

Adapted by Intelesi: Holcomb, Edie, Data Dynamics

5.9 TOOL 3: USING DATA TO TRACK ASSESSMENT

5.9.19 How to use this tool

5.9.20 Understanding the categories

EXPLAINING THE LEVELS				
LEVEL 1	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
Unsatisfactory	Poor	Satisfactory	Good	Excellent

EXPLAINING THE COLOUR CODING			
RED	**AMBER**	**GREEN**	**BLUE**
Non- compliant, emergency measures needed	Some efforts being made, but a more coordinated, inclusive and strategic approach is needed	Satisfactory, but there is room for improvement	Good, encourage the school to maintain this level and quality of engagement

CONCEPT	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
Assessment tasks	Teachers give textbook related tests, record results, and move on	Teachers give textbook related tests as pre-tests and modify for post-tests. Pre-test data are used to differentiate instruction	Teacher teams develop assessments based on prioritised grade/ subject standards	Teacher teams discuss results of assessments at least once a month	Results of formative assessments are used at least weekly for instructional planning. Results of summative assessments are used in formative ways to adjust plans
Collaboration in assessment tasks	Teachers plan instruction in isolation, relying heavily on textbook teacher guides and lecture for whole-group instruction	Teachers plan instruction in isolation and attempt differentiation	Teachers plan instruction in isolation, attempting differentiation, and increasing learner engagement strategies	Teachers discuss instruction and attempts to differentiate and increase learner engagement	Teacher teams use data to plan instruction; prepare common 'best practice' lesson plans; observe each other; include varied strategies; plan for high learner engagement
Assessment focus – proficiency or extension?	Interventions are focused on learners who need to get to proficiency	Timing of interventions prevents learners from on-going access to the regular curriculum	Interventions supplement regular instruction and extend opportunities to learn	Interventions are provided for all learners who are not yet proficient and do not interfere with access to on-going instruction	Teacher teams collaboratively create and deliver interventions and enrichments to support growth of all learners

5.9.21 Who must do what?

ROLE PLAYER	TEACHERS	SMT	DISTRICT OFFICIAL/ CURRICULUM SPECIALIST
Preparatory task	Discuss assessment use, extension etc.	Review the information provided by teachers	Ask the school to complete the analysis and provide the responses in the Subject Improvement Plan and School Improvement Plan Analyse the responses
Intervention	Mark as priorities for action in the Subject Improvement Plan	In priorities for action in the Subject Improvement Plan	Plan the intervention based on the responses provided and your own analysis Set incremental targets for improvement and explain both what and how the school can reach these targets Turn the 'standard' for the next level into an action to undertake and a target to strive for
Follow up	Implement the steps that will lead to improvement	Support and monitor the implementation of the actions required	Having set a date for implementation, plan to visit the school to review implementation and offer further support and assistance

What documents must this be linked to?

- The Subject Improvement Plan; The School Improvement Plan (SIP); the performance dashboard; the data warehouse.

Adapted by Intelesi: Holcomb, Edie, Data Dynamics

MODULE 6: MANAGING AN ICT CLASSROOM ENVIRONMENT

6.1 INTRODUCTION

While we are aspiring to have paperless classrooms, most of our classrooms still have one computer that is used by the teacher. Although the Interactive Board can be described as a single computer it comes with more access to both teacher and learners. In this Module we will look at how best the presence of this one and other computers in the classroom can be managed in such a way that learning is advanced.

Overall Aim:

- to acquire expertise in supporting teachers in the management of ICT classroom environments

Objectives:

- to understand ICT classroom environments
- to be aware of what an ICT classroom environment can afford
- to know how to apply these understandings to carry out Subject Advisor's responsibilities

6.2 DESCRIBING AN ICT CLASSROOM ENVIRONMENT

An ICT classroom environment is created by one or more digital devices. The following image shows some of these technologies.

Digital devices have certain enablers that can easily draw learner attention to learning. However it is important to guard against meaningless attention. Such attention brings about excitement that does not promote understanding of concepts taught in the classroom. A well-managed ICT classroom demands good preparation if it will produce desired learning outcomes. Click on this Intel site for more information on this subject. You are advised to consider teacher attributes and their teaching environments when going through the material to avoid being too prescriptive at the expense of promoting innovation in the creation of these learning environments. Go through the following list before you engage in the next activity.

- Pair learners up and set up a daily computer use schedule.
- Try to find time to have open blocks of time for individual learner use.
- Use a timer to keep learners to their time limits.
- Make sure computer time is used for creating products and doing research. All other pre-planning work should be done ahead of time (storyboards are a good way to do this).
- Use teacher-created templates for learners to fill in to save time.
- Display posters using computer terms and commands.
- Make sure computer etiquette and guidelines have been modelled.

ACTIVITY 6.1	
	Which from the above list do you think is not a choice? Justify your answer:

a.

b.

c.

The rest could be left to the discretion of the teacher as context issues and teachers' approach are bound to detect how this environment should be ordered and managed.

6.3 PLANNING FOR INTEGRATION OF ICT INTO THE LESSON

Before an ICT lesson is taught, it is important that preparation in terms of the content delivery is geared towards enhancing the pedagogical process. The following is based on the NteQ proposed by Deborah L. Lowthar and Gary R. Morrison in 1998. The planning process has 10 stages.

1. Specify Objectives
2. What Computer **functions/ affordances** will be used
3. Specify a **problem** to be solved
4. Plan how to **manipulate and organise** the data to solve the problem
5. How will the results be **presented**
6. Activities **prior** to using the computer
7. Activities **while using** the computer
8. Activities **after** using the computer
9. **Supporting** activities (At any stage of the project)
10. **Evaluation** of the learning, the software, the process and the outcome.

http://www.ise.ee/kronoloogia/murphy/classroom_management.html

The key words or actions on this model have been highlighted and they make clear considerations that need to be taken care of when preparing, delivering and evaluating ICT learning environments.

In the next activity, you will engage with them.

ACTIVITY 6.2 [E-Portfolio]	
	As a Subject Advisor you need to model what teachers should do to create this ICT learning environment and the model makes explicit how you would go about. Use the **NTeQ Model** to prepare an ICT integrated lesson. Remember: ICT is being integrated into the pedagogy – that which should already be existing before the integration. There should therefore be evidence that pedagogy is being enhanced by the use of ICTs. Stipulate how long the lesson will take.

6.4 NETIQUETTE

If ever collaboration or interaction of some sort is to happen, it is important that you prepare participants with guidelines and rules that should be followed. Netiquette are these rules that all on the discussion forum must adhere to if focus on learning and outcomes are to be achieved. It is very important for behaviour in an online environment to be managed otherwise learners are bound to digress and allow this learning space to deteriorate to shallow and meaningless posts. The following from the 'Rules and Behaviour on the internet' is an example of what the rules could be.

- **Include a subject line.** Give a descriptive phrase in the subject line of the message header that tells the topic of the message (not just "Hi, there!").
- **Avoid sarcasm.** People who don't know you may misinterpret its meaning.
- **Respect others' privacy.** Do not quote or forward personal email without the original author's permission.
- Acknowledge and return messages promptly.
- **Copy with caution.** Don't copy everyone you know on each message.
- **No spam (a.k.a. junk mail).** Don't contribute to worthless information on the Internet by sending or responding to mass postings of chain letters, rumours, etc.
- **Be concise.** Keep messages concise—about one screen, as a rule of thumb.
- Use appropriate language:
  - Avoid coarse, rough, or rude language.
  - Observe good grammar and spelling.
- **Use appropriate emoticons (emotion icons) to help convey meaning. Use "smiley's" or punctuation such as :-) to convey emotions. See website list of emoticons at http://netlingo.com/smiley.cfm and http://www.robelle.com/smugbook/smiley.html.**

As the teacher prepares for this learning experience he or she must take time to prepare learners and actually go through the rules with them to ensure all are on the same page. Part of preparing learners would mean introducing the lesson in class and guiding them on how to prepare for the discussion in terms of research and response to the question posed in the discussion forum. The teacher would have to be present to guide this interaction.

When observing a lesson, it would help to first identify the teacher's PCK weakness and then recommend the ideas suggested in this module.

Most teachers who have digital devices in their classrooms know how to operate them, but need guidance to use them productively to the benefit of teaching and learning.

Search for more sites and articles on how best to create effective learning environments

MODULE 7: HOW TO SUPPORT A TEACHER IN A DIGITAL CLASSROOM ENVIRONMENT

7.1 INTRODUCTION

The Guidelines for Teacher Training and Professional Development in ICT (2007:2) presents a holistic approach to teacher development that has the following dimensions (adapted from the European Union's T3 Core Curriculum for Telematics in Teacher Training):

1. A **pedagogical dimension**, which implies an understanding and application of the opportunities of the use of ICT for teaching and learning in a local curriculum context.
2. A technical dimension, which implies
    - an ability to select, use and support a range of ICT resources as appropriate to enhance personal and professional effectiveness; and
    - the willingness to update skills and knowledge in the light of new developments.
3. A collaboration and networking dimension, which includes
    - a critical understanding of the added value of learning networks and collaboration within and between partners; and
    - the ability to create and participate in communities of practice.

So far you should have realised that this manual attempts to focus on the first dimension and the second one is secondary. The aim is to bring in the second dimension to augment the first one. Module 6 included a feature that would be relevant to the third dimension. Module 9 will concentrate on this last dimension.

Overall Aim:

- to acquire skills and knowledge on how to support teachers in digital classrooms

Objectives:

- to understand the principles on ICT teacher development
- to know how to apply these understandings to carry out Subject Advisor's responsibilities

7.2 POLICY ON ICT TEACHER DEVELOPMENT

In this section focus is on understanding what is expected of us as officials responsible for curriculum support. It is for that reason that we will rely more on the 'Guidelines for Teacher Training and Professional Development in ICT (2007). The key areas for teacher development have already been highlighted in the introduction. This document further elaborates on the three dimensions in an attempt to eradicate confusion that might be caused by the use of terminology for instance.

When training teachers it helps to know and understand what they are trained for. They can be trained **about** ICTs, trained on learning **with** ICTs or on learning **through** ICTs. The highlighted prepositions are described as follows by the document (2007:3):

- Learning about ICT refers to exploring what can be done with ICT. This is an operational dimension that refers to skills that are necessary for the use of ICT.

- Learning with ICT refers to using ICT to supplement normal teaching processes and resources. It involves stepping into a culture and mindset that supports the practice of using ICT for educational purposes, regardless of one's level of expertise. ICT should be used to support new ways of teaching and learning, not simply as an educational extra, but as an effective means to support curriculum delivery and achieve educational outcomes.
- Learning through the use of ICT refers to utilising ICT to support new ways of teaching and learning. This requires a critical dialogue, analysis among teachers, and research resources to expand teachers' perspectives on the benefits of ICT
- ICT integration should not be about acquiring technical competencies but should be about "appropriate selection, use, mix, fusion and integration of many sets of competencies including, but not exclusively, those in pedagogy and technology" (Information and Communication Technology in Education, UNESCO; 2003:18) as cited in the document (2007:4). It is therefore the adoption of all that happens in the classroom with and through the use of ICTs.

7.3 PRINCIPLES FOR ICT IN TEACHER DEVELOPMENT

- Educational goals should be primary. The focus should not be on providing technical ICT skills only, but on the use of ICT to achieve learning outcomes.
- Teacher development programmes should provide teachers with situated/contextualised learning experiences. Programmes should be subject-specific and relevant to the learning areas. 5 Department of Education
- Teacher development programmes should be needs driven. Programmes should respond to the requirements of subjects such as Computer Application Technology, Information Technology, Geography, Design and Accounting.
- Ongoing support should be consistently available. This includes pedagogic support (particularly from Subject Advisers), technical support and creating communities of practice.
- Teacher development should be ongoing, due to the changing nature of ICT. Programmes should reflect new technologies and applications.

  (Guidelines on Teacher Training and Professional Development in ICT, 2007:4,5)

ACTIVITY 7.1

As a class

1. Discuss each of the principles, making explicit what they mean especially in your context.

As Individuals

2. The 5th bullet directly talks to your responsibility as a Subject Advisor.
   a. Based on the knowledge and skills you currently have, do you think you can support teachers?
   b. What do you still need to learn to ensure you are ready to support teachers with ICT pedagogical integration?
   c. How do you plan to equip yourself with the competences you need?

ACTIVITY 7.1	
	Share your responses with the class

The last question in this activity aims at making you realise that you have no choice for providing the needed support to teachers.

	Once you have identified and acquired the proficiencies you need, you should prepare to support your teachers.

The guidelines outline the implementation considerations that should be upheld when integrating ICTs into classroom teaching that can help you in your preparation to support teachers with their integration.

- There is no single best practice or general recipe for success.
- Teacher development programmes should be flexible in access, modes of delivery and content in order to make learning possible in meaningful and equitable ways.
- Teaching practice, including classroom organisation, will change if ICT is integrated effectively in teaching and learning.
- Teacher development should be managed.
- Programmes need not necessarily provide training in advance of requirements, but can concentrate on giving essential training as the need arises.
- Development programmes should not take teachers out of classrooms during normal school hours, so flexible delivery modes for training will be required.
- ICT development for teaching and learning does not happen in isolation, it also impacts on the management and administration of a school.
- ICT development has an impact on whole-school development. This implies that teachers at a school should develop a community of practice and support one another in developing ICT skills.
- Teacher needs and interests should be the driving force for their professional growth.

These guidelines are critical in any attempt made to support teachers. The last bullet above demands your knowledge of teacher needs if you are to intervene, otherwise your assistance might miss the target. This then calls for a development and maintenance of a close relationship with your teachers so they feel you are there to be with them and to work together in the advancement of educational goals. Change management becomes easier that way. This relationship should be bound by a professional environment or atmosphere that you would have created.

ACTIVITY 7.2	
	As individuals 1. Read through the implementation guidelines above and highlight what is key.
	As a class 2. Discuss and agree on what is the main message on the implementation guidelines

In order to support teachers in their integration of ICTs into their classroom teaching, you need to be able to identify or diagnose what their challenges are. The following is an analytical tool from the draft Professional Framework for Digital Learning (2017) that you can give to your teachers to complete before you go into their classrooms (once you have established a good rapport with them).

	CURRICULUM FOCUS					
1.	2. Integrate digital tools and resources to enhance learning objectives in contrasting learning environments.					
	CoPAF/T	Strongly Disagree	Disagree	Agree	Strongly Agree	Comment
a. I require the strategic use of digital content resources to enhance learner attainment in my institution.	Co / A					
b. I plan access for learners in my school to digital tools and resources as part of learning activities.	T					
c. I make a conscious effort to ensure that there is gender equity with the use of technologies in my institution.	T					
d. I encourage the use of specialist digital resources for learners with disabilities.	T					

	CURRICULUM FOCUS					
e. I encourage staff to let learners share their knowledge on online sites such as blogs, wikis or YouTube (among others).	Co					
f. I encourage teachers to plan and encourage learner exploration and self-directed learning.	P					
3.	4. Develop learners' global awareness and understanding through the use of digital communication and collaboration tools.					
		Strongly Disagree	Disagree	Agree	Strongly Agree	Comment
a. I encourage staff to design learning activities that address real-life issues or apply learning to real life examples.	P					
b. I encourage staff to make use of opportunities to design learning that requires collaboration between learners and the community.	P					
c. I encourage staff to make use of opportunities to design learning that requires learner to use communication and collaboration tools.	P					
5.	6. Transform learning through the innovative use of digital tools and resources.					
		Strongly Disagree	Disagree	Agree	Strongly Agree	Comment
a. I have explored new uses for established digital tools and resources.	CoPAF/T					
b. I have explored the potential of new digital tools and resources for key subjects and school leadership.	CoPAF/T					
c. I have explored approaches to learning with technology that were previously very hard to achieve without technology.	CoPAF/T					
d. I evaluate whether teaching and learning in my school is being enhanced through the use of digital tools and resources.	CoPAF/T					
7.	8. Enhance class management, assessment and feedback processes through the use of digital resources.					

CURRICULUM FOCUS						
		Strongly Disagree	Disagree	Agree	Strongly Agree	Comment
a. I require staff to regularly use tools such as (but not limited to) a word processor and spreadsheet to create and administer assessment activities.	A					
b. I use digital tools which facilitate the submission of and feedback to documents from my staff.	A					
c. I at times use polls and digital tools with diagnostic ability when conducting assessment of learning in my school.	A	X				
d. I am able to diagnose the results of major examinations in my school using digital resources.	A					
e. I have used a learning management system such as a blog, Obami, Edmodo or Moodle (or similar) to organise and monitor the learning process.	A					
9. 10. Integrate learner skill development in digital literacies skills with curriculum-based learning.						
		Strongly Disagree	Disagree	Agree	Strongly Agree	Comment
a. I encourage learning activities that develop the learners' information search and evaluation skills while pursuing curriculum goals.	CoPAF/T					
b. When it is available and accessible, I encourage learning that requires learners to use a variety of digital tools and resources.	CoPAF/T					
c. I encourage activities that develop the learners' media literacy skills (interpreting visual messages) while pursuing curriculum goals.	CoPAF/T					
d. I require staff to always promote safe, legal and ethical use of information during teaching and learning.	CoPAF/T					

After analysing their scores, decide what it is that you need to focus on in their TPAC and plan how you will go about assisting them.

ACTIVITY 7.3	
	1. Give the tool to at least 5 of your teachers and demonstrate how you have analysed the results. 2. Explain how you will plan to intervene for the 5 as a group and as individuals if need be

If your teacher/s allow you to go into their classrooms, you need to have a tool that can help you describe and identify what knowledge they need. At this stage, CoPAF can come in handy in identifying what their challenges are.

ACTIVITY 7.4 [e-Portfolio]	
	Describe what it is that you will be looking for in the CoPAF model?

Full CT integration	• •
Assessment	• •
Pedagogy	• •
Content	• •

This can become your lesson observation tool that you use to describe and identify teacher competencies through CoPAF.

7.4 PROVIDING FEEDBACK

When providing teacher feedback, it is important as already been pointed out that you as the advisor act as such and not as police looking for offences by teachers. Best practice in providing feedback recommends that you start by giving a positive general comment. That will ease the recipient and prepare them for more comments from you. Thereafter, state what could have made the performance even better?

	After observing an ICT integrated lesson, first ask the teacher how they think they performed and *use their ideas to extend, emphasise as you bring yours*. Remember you are both professionals and your role is to provide advice.

MODULE 8: DEVELOPMENT OF MATERIALS ONLINE

8.1 INTRODUCTION

Once you have identified your teacher needs and you have your implementation plan, you then need to design and develop materials that you can use to support teachers. With the dwindling of financial resources, developing resources online is the better option as printing expenses can be avoided. The question then is how to develop these online materials.

Overall Aim:

- to acquire expertise in developing materials online

Objectives:

- to learn an Instructional Design Model (ADDIE)
- to be aware of online design principles
- to identify a free online platform
- to develop materials online to help address teacher subject needs

8.2 AN INSTRUCTIONAL DESIGN MODEL (ADDIE)

ADDIE is one of the most common instructional design models. The image below captures and describes the components that make up this model.

So far we have explicitly and in some cases implicitly dealt with issues around the Analysis, Design, Implementation and Evaluation aspect of this model.

ACTIVITY 8.1	
	Create a template/ table with ADDIE and demonstrate how you would go about applying your understanding of the model by using what you have learnt so far on supporting teachers.

In this Module we are focusing on the Development aspect. We will develop course materials and as we do so we will acquire competencies we need in order to train and support our teachers to develop their own material. We are not just developing material but we are creating content for a specific learning environment. There are principles that need to be followed when developing materials.

In order to help understand what online learning environment is, Puzziferro and Shelton (2008:122) describe it as courses that are:

- well-organized into learning units;
- have clear learning goals and objectives;
- include materials and activities that directly support the learning goals and objectives;
- engage the learner through interaction with content, other students and the instructor; and
- offer rich and relevant resources for students.

Most of all, online courses should be fun, engaging, pedagogically sound, and relevant.

The challenge is how to go about achieving these aspects. Puzziferro and Shelton (2008:122) have identified 7 Principles of Good Practice which are:

1. Good Practice Encourages Contact Between Students and Faculty
2. Good Practice Develops Reciprocity and Cooperation Among Students
3. Good Practice Uses Active Learning Techniques
4. Good Practice Gives Prompt Feedback
5. Good Practice Emphasizes Time on Task
6. Good Practice Communicates High Expectations
7. Good Practice Respects Diverse Talents and Ways of Learning

With the exception of the first one, these principles form part of what we need to consider developing the online qualities described above. Page 128 to 130 of Puzziferro and Shelton (2008) attached article presents a template that you could use to develop your own material.

ACTIVITY 8.2	
	1. Read through Puzziferro and Shelton (2008) 2. With your subject partner, go through the template 3. On your own, create your own template and populate it with content you would use for your intervention strategy based on your subject. The

ACTIVITY 8.2	
	assumption or fact is that you have realised your teacher/s need assistance with teaching a concept in your subject. You are therefore developing material that should help them and which they can use to teach. 4. Once you have populated the template, present it to your subject partner. Critique each other's work and determine if the 7 Principles of Good Practice apply in your draft design.

	You will learn a lot by identifying and evaluating existing courses in your subject. Determine if they are able to achieve the set out outcomes for the intended audience. If not, think about what you could do better.

8.3 IDENTIFYING A FREE ONLINE PLATFORM

At this stage you are developing your programme and you will give access to your teachers and implement it online. Now that you are clear with the design items you want to include in your materials, you need to think of the online tool you will use. You therefore need to identify a tool that can accommodate your learning objectives. The following link takes you to a site that has 10 of the most popular free learning management systems you can use http://www.capterra.com/learning-management-system-software/. Moodle is one of them. Since GDE has adopted Moodle, I would advise you to use it, but that depends on whether it has features you will need for your online course.

ACTIVITY 8.3	
   	1. Study the tool you have chosen (read about it and work on it to see how it works) 2. In your subject groups, present your tool: a. Describe it b. Show how you access it c. Describe how you will use it for your course d. Take notes from the feedback you will get from your group and implement it

8.4 DEVELOPING MATERIALS ONLINE TO HELP ADDRESS TEACHER SUBJECT NEEDS

Now it is a matter of developing your materials – creating and designing your pages and uploading documents you would want your teachers or learners to use.

ACTIVITY 8.4 [e-Portfolio]	
	By now you know which topics need attention in your schools 1. Use the ADDIE Model to design a unit in your subject that learners or teachers are struggling with a) Describe what the challenge is and how you think your materials will help alleviate the challenge. b) On the tool you identified in Activity 8.3, design your unit. Go through the design principles highlighted by Puzziferro and Shelton (2008) Once complete, prepare to present it to your class on days agreed upon with your facilitator and class. You will be given constructive feedback; do the same for your classmates' presentations.

MODULE 9: PROFESSIONAL LEARNING COMMUNITIES WITH ICTs

9.1 INTRODUCTION

Matthew Goniwe School of Leadership and Governance has adopted the 10:20:70 model for its course delivery. The 10 and 20 % represents the learning that takes place in the classroom where 10% represents time spent on theory and 20 on practising opportunities through collaboration or simulation where possible. The 70% is the learning that should take place in the work environment. On the other hand, CochranSmith and Lytle cited in Wood (2007) have developed a taxonomy of the types of knowledge needed in the complex teaching practice. They mention "**knowledge-for-practice** emanating from outside experts; **knowledge-in practice** built—often unconsciously—as teachers go about their work; and **knowledge-of-practice** which is deliberate construction of knowledge by communities of teachers drawing on both outside experts and inquiry into daily practice" (2007:284). The last two knowledge practices relate to the 70% that happens at work. In this module we will focus mainly on the 'knowledge of practice' constructed through professional communities of practice.

Overall Aim:

- to acquire expertise in supporting teachers in their PLCs that are subject-based

Objectives:

- to understand how PLCs work online
- to know how to help teachers to form subject PLCs online
- to support teachers in their subject PLCs online

9.2 HOW PLCs WORK ONLINE

According to the description above, knowledge-in-practice is tacit knowledge, which is what teachers are able to do without thinking. Knowledge-of-practice then enables teachers to become aware of the tacit knowledge to the extent that they are able to express it as they share with their colleagues. In cases like that, Wood argues that "Over time, schools become places not only for learning but also for deliberate construction and dissemination of knowledge borne of research" (2007:284). In his advocacy for PLCs, Wood describes the devastation brought about by not sharing good practice as, "Lost expertise, lost curricula, lost inspiration, lost insight—all seem too much a part of school cultures that dismiss teacher knowledge and creativity or have no organizational structure for making it public, critiquing it, refining it, and preserving it".

In the case of online PLCs for teacher Dora SALAZAR, Zenaida AGUIRRE-MUÑOZ, Kelly FOX and Lisa NUANEZ-LUCAS (2010:1) commend them for allowing "upgrading of skills, increased productivity and development of a new learning culture". The communities are brought together by the same goals, interests and similar challenges. The community communicates or meets online to discuss and help each other solve discipline, administrative and teaching challenges. The interaction leads to providing each other with cues and best practice and therefore exposing one another to real learning experiences through collaboration.

ACTIVITY 9.1	
	1. Reflect on your teachers and share with the class how you see those forming PLCs and what it is that would bring them together. 2. Describe how you see them learning from each other.

9.3 HELPING TEACHERS FORM PLCS ONLINE

Since a PLC is a learning community, it would not make sense if teachers with the same struggles are grouped together. Literature recommends these be formed based on subjects and grades taught as these groups are likely to share lessons that would apply to all. This link provides ideas on how to build and maintain PLCs http://www.learnnc.org/lp/pages/7012. In the case where PLCs do not exist, it is recommended that you suggest to teachers to form such and state what the advantages would be. Remember everybody in the group should benefit and therefore mentioning the specific benefits the group is lightly to gain would motivate participation from potential participants. The main gain from PLCs online is the availability of all anywhere and anytime.

There are two types of discussions that the PLCs can agree to engage in. There are synchronous discussions where participation must be in real time. In such a case, the community can agree on a time when all of them can be online and chat. Asynchronous discussions are not time bound as they can happen anytime. It would help if members agree on what works for them and when.

Social networks, blogs and discussion forums on Learning Management Systems can be used as tools to communicate in these spaces. The choice of tool should depend on access, bandwidth, features needed for the participation. A tool like Google Docs for instance would be ideal for sharing of documents and for editing each other's work. The following image shows some of the tools that can be used for this purpose.

PLCs are more than meetings, sharing resources over tea, fixing agendas etc. PLCs are voluntary, bottom-up. Professionals can take ownership of their own learning. It is very informal and not limited to doing "compulsory" tasks.

Activity 9.2 [e-Portfolio]

Create a group using any social network for your teachers. You could use the discussion forum for the tool or Learning Management System you identified. Organise a chat session with them where you are assisting them understand a particular concept they need help with. The aim is to model how teachers should participate in an online chat group.

For a successful learning experience prepare a check list that you will use to ensure all are ready at the arranged time and that the level of participation is of a high standard.

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