



Department of Science and Technology Education

COMPUTER INTEGRATION

IN THE CLASSROOM

Only study guide for **CIC2601**



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PREFACE

PURPOSE OF THIS STUDY GUIDE

This study guide provides you with content knowledge and skills to integrate Information and communication technologies (ICTs) in the classroom, which involves evaluating the available ICT resources before using them to develop technology-integrated lessons. The school's ICT role players play an essential role in effectively integrating ICT in teaching and learning. We will explore their contribution and how it is justified through ICT theory. Then, we will explore application programs that are enablers to the achievement of lesson outcomes. The ICT literacies in this learning unit suggest some ways of selecting and integrating the appropriate ICT tools in teaching and learning. The evaluation of software programs and website sources will assist you in catering for the backgrounds of a diverse range of South African learners. The study guide will conclude with an assessment of computer security risks and safeguards.

You will notice that we refer to a QR code in the study guide. You might also have noticed that a QR code is used in shopping malls, brochures and notice boards. A QR code is a matrix barcode that is scanned by a device. This scanned code typically contains a link to a video, document, contact details or email address. An example of a QR code is shown in figure 1.

To scan the code, you need to download a QR code scanner. You will find a QR code scanner in the application store of your cell phone or tablet. It uses the camera function of your phone to scan the code; decipher the hidden code; and display the hidden link that will open the video, document, contact details or email address. If you scan the above QR code, it will give you more information about QR codes. You can also click on the link below for more information.



Figure 1: What is a QR code

https://www.youtube.com/watch?v=xvQ2ScH1q18

ICONS USED IN THE LEARNING UNITS

Icon	Description
	**Learning outcomes.** The learning outcomes indicate which aspects of the particular topic or learning unit you have to understand. You should be able to demonstrate your understanding.
	**Activity.** The activity icon refers to activities that you must complete in order to develop a deeper understanding of the learning material.
	**Scenario.** The scenario icon refers to a real-life problem/situation. In this activity you need to apply what you have learnerd in order to solve the problem presented in the scenario.
	**Definition.** The definition icon in the context of this study guide implies that you are provided with the meaning of a word.
	**Discussion forum.** The discussion form icon refers to activities that you need to complete while interacting with your fellow students so that you can learn from their input or opinions.
	**Additional discovery.** The additional discovery icon refer to activities that you can complete to develop a deeper understanding of the learning material.
	**DIY box.** The diy (do it yourself) icon is an additional challenge that you can do as enrichment.
	**Concept testing.** The concept testing icon refers to an acitivty where you need to display your understanding of a topic by giving examples and applications of the concepts (theory into practice).

Learning Unit 1

The integration of ICTs in South African schools

1.1 INTRODUCTION

The emergence of Information and Communication Technologies (ICTs) has serious implications for the career paths of 21st century learners and the purpose of educational institutions. The South African education system, like the education systems of many other countries worldwide, should respond to the numerous changes brought about by the use of ICTs in teaching and learning. This learning unit will introduce you to the way in which the South African government is responding to the advancement of ICT usage in teaching and learning.



Learning outcomes

At the end of this learning unit, you should be able to:

- Discuss and evaluate the appropriate use of ICTs in line with historical and current South African perspectives
- Explain how to integrate ICTs in a South African context
- Compare the use of ICTs based on research reports and articles in this field

CONTENT

- The current use of ICTs from a SA perspective
- The development of a technology-integrated lesson
- Comparison of ICT usage based on research reports and articles in this field

1.2 HOW DO SOUTH AFRICAN SCHOOLS USE ICTS IN CLASSROOMS?

The integration of ICTs in the South African education system continues to pose a remarkable challenge to South African teachers. The implementation of ICTs in South African schools is aimed at providing quality education to all (Ndlovu & Donovan, 2012). The South Africa e-education policy goal explicitly emphasises that every South African learner should be technologically well-informed (Telkom, 2015). The enhancement of teaching and learning through ICT usage should remain a priority in this information era (Telkom, 2015). In the same way ICT, as enabler, would have a huge impact on the performance of South African learners. The acquired knowledge and skills will assist

teachers in tapping into better educational content; teaching and learning potential and administrative systems (Telkom, 2015).

The following initiatives will give you an indication of how South Africa responded to the advancement of ICT in teaching and learning;

The Khanya project is one of the first examples of e-learning implementation in South Africa. The project started in 2001 and was aimed at meeting the need to integrate ICTs in schools in the Western Cape Province (Telkom, 2015; Van Wyk, nd.) The project targeted the integration of available ICT resources in schools. The ICT resources were delivered to 613 schools and the teachers were trained in how to use them (Telkom, 2015). According to Van Wyk (n.d.), the meaning of the word, khanya in English is 'enlightenment'', which suggests that teachers and learners were expected to be exposed to and be knowledgeable about the use of ICT resources in teaching and learning. This project was aimed at providing ICT skills that would broaden learners' learning experiences that might not otherwise have been possible without the use thereof (Van Wyk, n.d).

The Meraka Institute, which was formed by the Council for Scientific and Industrial Research (CSIR), also looked at ICT implementation in SA (Telkom, 2015). This institution used ICT in education research and supported the Department of Education's goals with regard to the use of ICT in the South African context. According to Telkom (2015), there is the need to deal with barriers to effective integration of ICTs in teaching and learning. In addition, (Telkom, 2015), teacher training methodology is expected to be reviewed to ensure that teachers are well-trained in using ICT tools in teaching and learning.

Intel® Teach programme initiated the use of ICTs in South Africa in 2003 (Wilson-Strydom & Thomas, n.d.). This project focussed on improving teachers' teaching methods in line with the integration of ICT (Butcher & Associates, 2011). They trained teachers; and, in turn, teachers were expected to train their colleagues at various schools. Few teachers (Butcher & Associates, 2007) managed to train their colleagues; this might be the result of training that was not thoroughly done.

The Gauteng online project was based in Gauteng (GP). This online project focussed mainly on developing learners' 21st century skills in using ICTs (Isaac, 2007). Computer laboratories were erected and fitted with 25 desktop computers connected to the internet. Only Gauteng learners and teachers benefitted from this project. On 8 May 2012, it was reported by *Pretoria News* that not all schools in Gauteng benefitted from this project and most computers were not operational. Serao (2012) performed an audit and the results revealed the following:

- inadequate security measures
- Gauteng online
- inadequate support and maintenance of equipment
- failure to replace stolen goods
- failure to pay service providers on time

The paperless classroom project was implemented in 2015. A total of 300 Grade 12 learners in 300 Gauteng townships and rural schools received tablets for educational purposes (Rahlaga). The distribution was supposed to be completed by the end of the 2017/18

financial year; and the cost was estimated at R17 billion (Monama, 2016) over a period of five years (Education spokesperson, Oupa Bodibe). The aim of this project was to move learners from physical textbook-based information to accessing the information on tablets (Monama, 2016); information also included access to learning material, workbooks and other subject matter (The provincial Department of Education, 14 January 2015).

Teachers were trained but were not given enough time to familiarise themselves with the use of tablets and interactive whiteboards, Education spokesperson Oupa Bodibe said.

Teachers are expected to be present during all learner activities, since tablets are meant to enhance learning, because they are like learner textbooks. Although the performance of the learners improved there was a drop in the pass rate, which showed quality passes (Monama, 2016). Learners who failed Grade 12 admitted that they enjoyed the benefits brought by this tool rather than using it for educational purposes.

Access the following YouTube video clip and learn more about how SA teachers and learners use ICTs in teaching and learning (11:15 min)

https://youtu.be/hJYxN5tFEus

Read the following scenario and answer questions that follow.



Scenario

Kelapile secondary school is situated in a rural area. There are 30 teachers and 1000 Grade 8 to 12 learners. The school's information and communication technology (ICT) infrastructure is as follows: (No other hardware, services or ICT skills exist.):

Thirty tablets have been provided to Grade 12 Mathematics learners; two Grade 12 Mathematics classrooms have been fitted with interactive white boards and two printers for administrative use in a classroom that is not secure. The only information available on the tablets is the Grade 12 Mathematics syllabus and previous question papers. The operating system and Microsoft Office suit have not been installed. Internet connectivity is available, but not reliable.

Two Grade 12 Mathematics teachers are computer literate and they teach Mathematics to the learners by navigating the syllabus and previous question papers on the tablets and using the interactive white boards.

The use of ICT in the school for teaching, learning and administration is not successful. For example, the available ICT tools are only used occasionally; some tablets are not operational; there is not an ICT coordinator or an overseeing ICT committee at the school and the principal and school management team (SMT) are not ICT users.

Questions

(1) In your opinion, what are possible reasons why the integration of ICT in Kelapile secondary school is not successful?
(2) Describe six major interventions that the Department of Education can implement to ensure the effective use of tablets in schools.
(3) What do you think could be the best ways for ICT implementation in schools? Explain.

1.3 DEFINITION OF A TECHNOLOGY-INTEGRATED LESSON

A technology-integrated lesson can be described as a unit of teaching and learning in which a coherent series of teaching and learning activities are performed to achieve a specific outcome (InfoDev, 2015). As a teacher, you should be able to plan, develop, present and evaluate your professional practice (teaching-learning events). You need to know beforehand what a lesson's intended outcomes are; what the content is; how the lesson will be sequenced; what teaching strategy you will use; what your role should be; what activities your learners should do; and how they will be assessed. On completion of a lesson, you should also reflect on ways of improving your teaching method.

Another responsibility of a teacher is to develop and present technology-integrated lessons in which learners can better understand content; and lesson outcomes can be achieved. Lesson planning is a highly professional activity and an important skill you are expected to acquire to become an effective teacher. A multi-facetted activity requires sound knowledge and skills in aspects such as the content of a subject; knowledge of learners; teaching strategies / methods and how assessment is done. As a professional teacher, you will be expected to do lesson planning for every theme or content subject you present to the learners. As such, lesson planning is part of your job description. The following questions would guide you on how to plan your lesson.



Definition

A lesson plan can be described as a detailed description of the course of instruction that guides a teacher to provide knowledge to learners (Wikipedia. nd.). The information and skills will vary from one teacher to another, since it depends on a teacher's preference and on the needs of the learners.

The duration of a lesson is not necessarily equivalent to a period in the school timetable, but is dictated by how long it takes to complete the activities planned for a lesson – it might require one to several periods.

Why do you have to plan a lesson? Proper planning plays an essential role in this profession. You are expected to develop, present and assess the achievement of lesson outcomes. The first step that you must take is to set the intended lesson outcomes. What is the content (subject matter) you would present to learners; the sequence of a lesson; teaching and learning strategies and methods; and the activities of teachers and learners? How will the assessment I be done?

Since you are an inexperienced teacher, you obviously need a more detailed lesson plan. However, even the most experienced teachers have to give a careful thought to planning lessons, since technology changes from time to time and ultimately have to be successful.

What are the ingredients of a lesson plan?

Figure 1.1 shows the ingredients of the lesson plan that include lesson outcomes, activities and assessment.

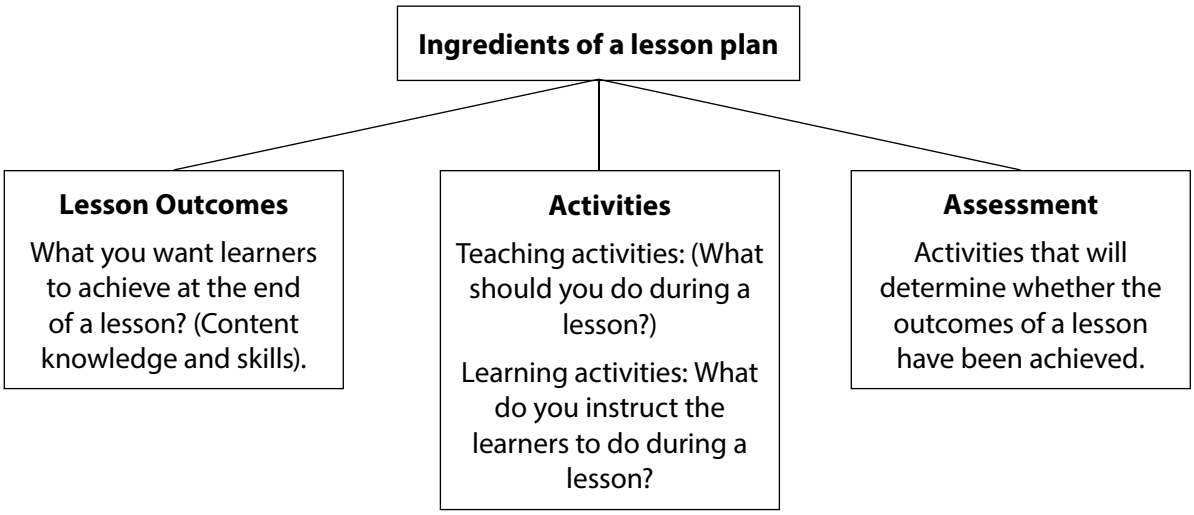
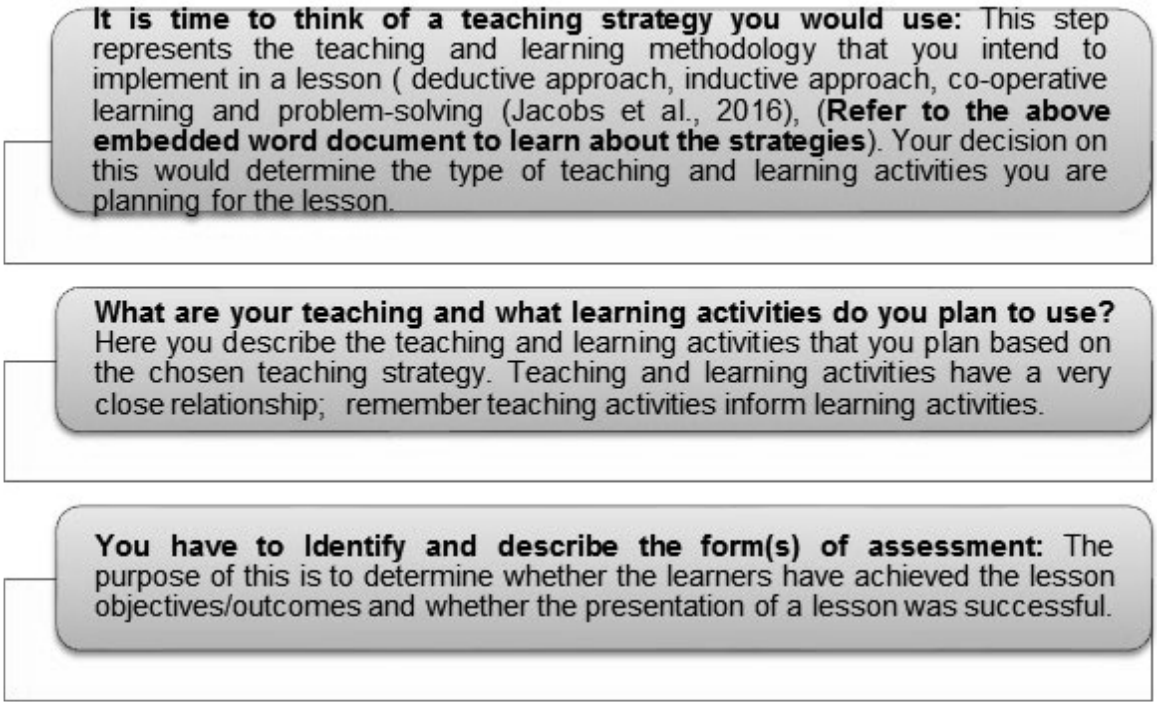


Figure 1.1: The ingredients of a lesson plan

The process of planning a lesson includes the following:

Table 1.1: The process of planning a lesson

Decide on a lesson topic The topics and sub-topics are clearly set out in the CAPS document of your subjects.
Decide on lesson objectives/outcomes At this stage you are expected to identify the content knowledge and skills you expect the learners to achieve at the end of the lesson. These are described as lesson objectives/ outcomes.
Now you must decide on the teaching method you will use: As a professional **teacher,** you have to indicate the technique you will use to present a lesson; that is, direct teaching, discussion, demonstration, questioning, practice/drill and review, case study and project (Jacobs et al., 2016), (refer to the word document below to learn about teaching methods).



Lesson planning is done by means of a lesson plan format (or template). There are many formats/templates; and it is not particularly important which one you use as long as it is done properly. As you become more experienced in technology–integrated lesson planning, you will probably develop your own lesson template that you feel comfortable with. However, the general lesson plan format proposed in table1.1 is particularly appropriate and relevant; yet simple enough to be used by a novice teacher.

Table 1.2: A lesson plan format for designing and developing technology-integrated lessons.

Grade		**Date(s):**	**Time allocation**	
Subject				
Lesson topic				
Scenario/context				
LTSM(s)				
Lesson phases	**Teaching strategy**	**Teaching method**	**Teaching activities**	**Learning activities**
Introduction Establish context. Review prior knowledge. State the problem.				

Development Introduce new content. Apply new content.				
Consolidation Review new content.				
Assessment				
Reflection				



Scenario

Designing and developing a technology-integrated lesson.

Guidelines

You have to develop a technology-integrated lesson with a lesson topic of your choice. Assume that every learner will have a computer to work on; and that there are sufficient printer facilities to print his or her work.



Activity

Answer the following questions:

(1) Mention three lesson outcomes; that is, what you would like your learners to achieve at the end of your lesson.
(2) Briefly explain the importance (or value) of a scenario in a lesson.
(3) Name a teaching strategy and a teaching method relevant to your topic.
(4) Describe the technology; that is, application package(s) and /or other resources you are going to use in this lesson.
(5) Describe at least three teaching activities you are going to perform in this lesson.
(6) Describe at least three learning activities you are planning for your learners in this lesson.

1.4 COMPARISON OF ICT USAGE BASED ON RESEARCH REPORTS AND ARTICLES IN THIS FIELD

What research report and articles?

The integration of ICTs in teaching and learning plays a vital role in learners' successes and prosperity in life (Ndlovu & Donavan, 2012). The use of ICTs in teaching and learning does not only enhance learning, but also prepares learners to work in an economy that has rich technological challenges. Another advantage of the use of ICTs in teaching and

learning is that learners are provided with the opportunity to participate actively in their learning experience. The active participation develops their 21st century skills, which in turn contribute to their success when they enter the workforce (Ndlovu & Donavan, 2012).

Wikis (n.d.) points out four broad intertwined issues which must be taken into consideration when institutions think of implementing ICTs in teaching and learning, namely:

- effectiveness
- cost and equity
- sustainability

The success of ICT implementation depends on the knowledge about an institution's purpose. Wikis (n.d.) suggest teamwork spirit in the implementation of ICTs in teaching and learning. Institutions must ensure that the utilisation of ICTs targets certain learners who truly benefit from it. ICT integration should target learners and teachers in a way that truly serves their needs (Wikis, n.d.).

The ICTs provide learners with a diverse range of learning styles. Advancement in mobile digital resources offers learners a flexible platform for learning. This platform enables learners to experience a real life situation. The different learning preferences accommodate all learners from diverse backgrounds. The integration of ICTs in teaching and learning forces a paradigm shift of teaching and learning, a shift from teacher-centred teaching to learner-centred teaching (Majumdar, 2006). The new roles of a teacher, a learner, curricular and new media are practiced. Table 1.2. illustrates this paradigm shift (Majumdar, 2006):

Changes in a teachers' roles	
From	**To** ⇒
Transmitter of knowledge	Guide, facilitator of knowledge
Controller of learning	Creator of learning environment
Always expert	Collaborator and co-learner
Learning to use ICT	Using ICT to enhance learning
Didactive/expository	Interactive, experiential/exploratory
Changes in a learner's' roles	
From	**To** ⇒
Passive learner	Active learner
Reproducer of knowledge	Producer of knowledge
Dependent learner	Autonomous learner
Solitary learner	Collaborative learner
Solely learning content	Learning to learn/think/create & communicate

Changes in curricular and presentation	
From To ⟹	
Memorising facts	Inquiry-based
Artificial teaching exercise	Authentic learning
Rigid presentation	Open and flexible presentation
Fixed time and space	Anytime and anywhere
Single path progression	Multipath progression
Changes in the use of ICTs	
From To ⟹	
Single ICT application	Multimedia application
Delivery of information	Exchange of information
Single sense stimulation	Multisensory stimulation
Monologue communication	Dialogue and collaborative
Analogue resources	Digital resources

The table above illustrates how the use of ICTs transform a teaching and learning environment provided with enabling conditions. ICT users across the globe must be kept abreast of new developments in the use of ICTs (Telkom, 2015). In this way, teachers and learners would not lag behind, but participate effectively with peers globally. However, it is not advisable to have rich ICT resources, but the teachers and learners do not know how to use them.

Additional Resource tool: More information has been uploaded on the myUnisa **Additional Resource** tool. Read the material for a better understanding of ICT use in classroom.



Scenario

The authors in this unit have shown how a technology-integrated lesson is vital in this 21st century. Your pedagogical practices would change because of the use of ICTs. The learning environment would be more conducive to the integration of ICTs in teaching and learning. Briefly explain your participation in the effective implementation of ICTs in a school.

1.5 PERSONAL REFLECTION

Digital natives are more fascinated with the use of ICTs in their learning environments. This module assists you in learning how to use ICTs in teaching and learning. Now you find yourself in a situation where you are expected to facilitate a technology-integrated lesson. Your learners are a challenge in your facilitation of a lesson, because of their knowledge of ICT tools. How would you control this situation? Reflect on an uncontrollable learning environment.

1.6 CONCLUSION

This learning unit assisted you in understanding the appropriate use of ICTs in current South African perspectives; the integration of ICTs in a South African context also formed part of this learning unit. You were led to understand how lesson planning is vital when using ICTs in teaching and learning. The opinions of other authors concerning the use ICTs in teaching and learning were highlighted and this information would assist you to better understand ICT integration in teaching and learning. Learning unit 2 will elaborate further on the use of ICTs in schools, but the focus will be on the roles of ICT users in a school setting.

Learning Unit 2

Support with the integration of ICTs in classroom activities

2.1 INTRODUCTION

To understand the importance of this learning unit, you first need to answer the following question: 'Why do teachers need to integrate technology in the classroom?' To help you to answer this question, watch the following YouTube video clip and pay attention to how this question is answered by the presenter of the YouTube video clip.

To watch the YouTube video (1:19 min); make sure you have access to the internet; then click on the link shown below, or scan the QR code shown in figure 2.1.

https://www.youtube.com/watch?v=kMi13DoDBAM



Figure 2.1: Why is Technology important in education?

To see an example of the value of integrating technology in the classroom, watch the YouTube video clip (1:58) about bringing technology to rural Africa. Click on the link; or scan the QR code shown in figure 2.2.

https://www.youtube.com/watch?v=sAv12l3TiTg



Figure 2.2: Bringing technology to rural Africa

In this YouTube video clip (Figure 2.1), ten reasons are mentioned why it is important to integrate technology in your classroom. However, one reason that was not mentioned is that learners already use technology while experimenting with various applications on tablets, smartphones and laptops (Webanywhere, 2016).

For educational purposes, researchers claimed that technology could be used, among others, to improve the engagement of learners. When learners are engaged, it creates opportunities for them to improve knowledge retention and to learn in a way that is comfortable for them. Furthermore, it encourages learners to collaborate and even to learn life skills through technology. Lastly, with many online resources available, it can help teachers to improve their teaching (Webanywhere, 2016).

Because technology is part of the everyday lives of learners and teachers, you will agree that we cannot withhold the use of technology / ICT in our classrooms. However, to be able to do so, teachers and learners need to have access to technology. The technology needs to be supplied by the school or the learners have to bring their own devices (BYOD). However, the question arises: 'How will teachers who perhaps know very little about technology and tools be able to get assistance and support so that they can change

their teaching methods to incorporate technology and online learning applications in their classrooms?'

To answer this question, education policymakers and planners first need to be clear about the ICT needs and educational outcomes of their country (as discussed in learning unit one) and school. This information will assist them in understanding better how to achieve their common goal/outcome regarding ICT integration in the classroom. This learning unit provides you with an understanding of ICT role players in a school setting; and how to justify their roles by ICT theory.



Learning outcomes

At the end of this learning unit, you will be able to:

- Identify various role players for effective integration of ICTs in classroom activities.
- Discuss how the implementation of roles is done and how supportive role players are in the use of ICTs in a school context.
- Justify the roles by using ICT theory, for example the Activity Theory.

2.2 ROLE PLAYERS IN THE EFFECTIVE INTEGRATION OF ICTS IN CLASSROOMS

Teachers will have to embark on a journey to integrate technology in the classroom; but, at last, they are not alone. In this section, we are going to discover role players that will have an impact and offer you support on your journey. The role players will include:

- government
- decision-makers
- ICT support
- educational specialists
- peers
- learners

Each of these role players will play a different role in supporting the integration of technology in the classroom. Some of them will be involved in the budget decisions; decisions on what technology to use; what software and infrastructure to buy, strategy development, changes to classrooms, labs and buildings; and training and support offered to teachers in the use of technology. Other role players will serve as coaches or as members of a community of practice.

2.2.1 Examples of role players in the integration of ICTs

The e-Learning directorate of the Gauteng provincial department of Education developed guidelines on the management and usage of ICTs in public schools in Gauteng (2011: p. 26–31). The examples of role players and their responsibilities are listed below in table 2.1.

Table 2.1: Role players and their responsibilities in ICT integration

Role player	Responsibility
School management team (SMT) (Principal & School governing body (SGB))	Facilities; budget; infrastructure; vision; policy; ensure usage of resources; ensure literacy skills; communication with parents; integrate ICT into teaching and learning; and schedule and manage ICT-related training.
School ICT committee (includes the ICT coordinator, subject specialist and HOD)	ICT planning; ICT policy; identify funding sources; schedule training; identify and select educational software involved in e-Learning activities; assist teachers with lesson plans; recommend ICT tools; monitor ICT usage throughout the school and monitor how ICT is used.
ICT coordinator	Provide technical backup; troubleshooting and computer literacy training; set the time-table; pedagogical and instructional design; encourage the use of ICT; system maintenance; and report faulty or stolen equipment,
Subject specialist / HOD	Identify educational software
Teachers	Find information on the internet and evaluate it; plan projects and lessons that integrate technology; find resources for different tools, for example TV or the use ICT for administration
Community	Provide training and technical support, security arrangements of school
Businesses	Financial assistance, expertise and resources
Parents	Provide training and technical support and security arrangements of school

To extend the list of role players in implementing ICT in schools, watch the following YouTube video and pay attention to all the stakeholders/ role players mentioned. Also pay attention to the trends that can change the direction of the education and or integration of technology. To watch the YouTube video (1:58 min), either click on the link shown below, or scan the QR code shown in figure 2.3.

https://www.youtube.com/watch?v=25C0jfaO2Tc

Figure 2.3: Toolset 1, identifying stakeholders and trends

Let us look at some more examples in this YouTube video clip. To watch the YouTube video (1:34 min), either click on the link shown below or scan the QR code shown in figure 2.4.

https://www.youtube.com/watch?v=socHQR7Ba-o

Figure 2.4: Stakeholders in Education



Discussion forum

Make a list of the additional role players and their responsibilities that you have identified after watching the video clips indicated in section 2.2.1 in the myUnisa Discussion Forum.



Activity

(1) In table 1 (section 2.2.1), examples are given of possible role players when integrating ICT into the classroom. Click on the link to the presentation (or scan the QR code in figure 2.5) and watch the video clip on slide 4. This video clip is about ICT in the 21st century. Identify the four countries that they mentioned (3:40) and the technology each one of these countries want to use to integrate technology in their classrooms.

https://prezi.com/hc9c-eu7rhua/
the-benefits-of-using-ict-in-the-classroom/

After you have identified the country and technology, add the role players involved in integrating these specific technology integrations. An example is given in table 2.2.

Figure 2.5: Benefits of using ICT in the classroom

Table 2:2: Activity: Role players in ICT

Country	ICT / technology	Role players
(1) South Korea	Digital text books & Online learning	School management team School governing body ICT coordinator School ICT committee Subject specialist Teacher
(2) Denmark		
(3) United States		
(4) Australia		



Scenario

Click on the link and watch the following YouTube video (10:20 min):

https://www.youtube.com/watch?v=vmMU5-By_dU

In his TED talk about teaching tomorrow's children, Tony Pots mentioned that there is a disconnection between how we use technology at home and at school. He challenged the audience and mentioned that the reason for teaching in the same manner as in the past is "fear". Fear for the unknown; fear for the cost of technology and fear for not knowing as

much as the learners do. He said that to reduce the fear teachers need to go ahead and integrate technology in the classroom. After watching the video, you overhead another teacher (Sarah) talking about engaging learners and using ICT for assessments. She said she is going to use Zipgrade. You decided that you are also going to try it out, but you do not know where to start. All that you know is that the application is used on a mobile phone and that it allows you to do multiple-choice questions (https://www.zipgrade.com/).

(1) Complete table 2.3 below by indicating the role of each one of the following role players in assisting you to master Zipgrade:

Table 2.3: Activity Role players in integrating technology.

Role player	Role
Teacher (you)	
Sarah	
ICT coordinator	
Subject head / HOD	
Parents	
Learners	



Additional discovery

(1) Below is a link to a document published on the topic of ICT for schools. Open the link or scan the QR code in figure 2.6. Without reading the document, and only focusing on the table of contents (p. iii – vi), identify the role players involved in making the integration of ICTs in schools possible.

http://www.sdpi.ie/inspectorate/ICT_in_schools_insp_report.pdf

Figure2.6: ICT in Schools

2.3 SUPPORT PROVIDED BY ROLE PLAYERS

You have now established that the integration of ICT in a classroom is important and that there are various role players in this regard. Each role player has a task and a responsibility to work towards a common goal, which is to develop lifelong learners (Lento, 2014). On a managerial and strategic level, the management of the school; the school governing body; the provincial government and the national government will have a role to play as discussed in section 2.2.1. Their roles will include responsibilities such as setting up infrastructure; the budget and the overall training of staff and policies. In this section, the focus will be on how the integration takes place in the classroom and the roles of teachers and learners; and, more specifically, what kind of support they can get.

To find out how teachers and learners can integrate technology in the classroom, the teacher first needs to align the use of technology with the learner's learning goals (Prakash,

n.d.). A teacher's ICT content knowledge and skills need to be taken into consideration (Ghavifekr, & Rosdy, 2015) since they will be the primary implementers of technology in the classrooms. However, Yang and Wang (2012) recognised the importance of having technical support available to assist teachers in using technology. In addition Ghavifekr and Rosdy (2015) suggest that peer tutoring can be of great value to guide and assist another teacher who has less ICT experience. What is surprising is that teachers are reluctant to use the technology; therefore, the school management team needs to consider offering encouragement to teachers. What might encourage teachers to use ICT in education is the freedom to design their own teaching while integrating technology (Ghavifekr & Rosdy, 2015).



Discussion forum

The kind of support available involved role players at managerial, legislative and classroom level. Create four threads in the discussion forum. In the **first** threat, indicate the role the school governing body will play in integrating technology; in the **second** thread, indicate how the national and provincial departments of education can play a role in integrating technology; in the **third** thread, indicate the role of subject specialists/HOD; and in the **fourth** threat, indicate the role of other teachers (colleagues) in integrating technology in your classroom.



Activity

There are many different kinds of technology available. In some cases, you need to have special equipment like, for example, an interactive whiteboard, internet connection or clickers. In other instances, you need specific software such as a learning management system, a voting tool or other applications. In some software tools you have software you need to buy or register for (licence) and in other instances, it is free like freeware or open source software (Gunter & Gunter, 2015).

Select one of the following topics and complete table 2.4 below:

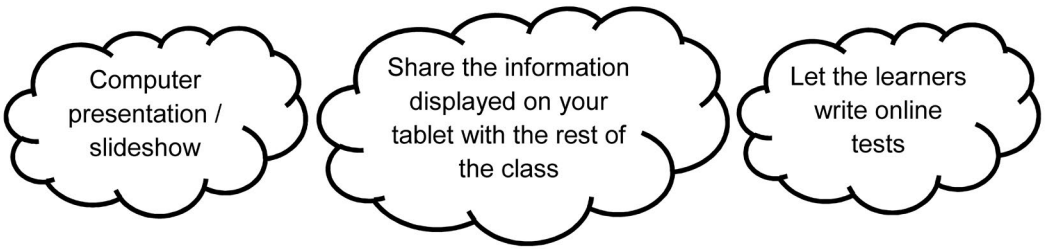


Table 2.4: Support when integrating technology

Tool to be used	Outcome that is attended to.	How will the teacher use it?	How will the learner use it?	What kind of support is available?



Scenario

You are teaching history to Grade 9 learners. You have realised that only a few learners respond when you ask questions. While looking for ways to get learners actively involved during the lesson, you read an article about clickers. However, you realised that the school currently does not have clickers; and you want to implement your new strategies as soon as next week. While you were searching the internet for possible solutions, you came across Kahoot! (For more information about Kahoot! Watch the video clip (3:40 min) https://www.youtube.com/watch?v=PlXpKHH5kh0). You decided that you are going to use Kahoot in your class to involve the learners and have some fun. In section 2.3, Prakash (n.d.), Ghavifekr, and Rosdy (2015) mentioned five important items to take in consideration when integrating ICT in the classroom.

(1) Use these five important items to create a template/table that teachers can use when planning their integration of technology. Therefore, take the learning goals; ICT content knowledge and skills of a teacher; the technical support needed; the possible peer tutoring; involvement from management and the devices the teacher and the learner need to use (these will form the headings of your template / table) into consideration.
(2) To test your template, use it to do planning for of the use of Kahoot in any lesson topic of your choice.
(3) With the exception of the items mentioned above, are there any other role players that need to be involved in your use of Kahoot?



Additional discovery

(1) With the advice of Ghavifekr and Rosdy (2015) taken into consideration, choose as many kinds of technologies that you want to experiment with in your future classroom. Remember to keep in mind how you will be able to link it to your curriculum; and you need to decide on the availability of ICT resources. In the discussion forum, enter as many technologies as possible. Pay attention to what the other students are adding, since it may also inspire you to use more types of technologies.
(2) A part of the responsibilities of the ICT coordinator is to "Encourage the use of ICT in teaching and learning" at the school. However, the teachers keep on teaching in the traditional way. When asked why they do not integrate ICT in their classrooms they gave the following reasons:

- not enough time for preparing ICT resources for lessons
- no self-confidence to use ICT
- no support during lessons, especially where pupil-to-computer ratios are poor
- a lack of technical knowledge to troubleshoot if a problem arises
- It is difficult to use computers.

In your opinion, which role player will be the best to attend to these concerns/barriers? (Unesco, 2005):

(3) A school's ICT coordinator can support the school by performing many functions. These functions can include the supervision of equipment; maintenance and troubleshooting

as well as training. Use the internet and search for functions of the ICT coordinator; and make a list of the most common tasks of the ICT coordinator.

2.4 ICT THEORY (ACTIVITY THEORY) USED TO ILLUSTRATE VARIOUS ROLES

In the sections above, you have identified and explored the roles and responsibilities of a variety of stakeholders when implementing ICT in the classroom. To assist you further, an Activity theory (Engeström, 1987) was selected to demonstrate the roles and support when teachers integrate ICT in classroom environments.

2.4.1 Define the activity theory

The idea of the Activity Theory is grounded in social historical theories and draws heavily on Vygotsky's concept of mediation (Gedera, 2014). Vygotsky (1978) introduced the concept of mediated action as seen in his triangle of mediated action in figure 2.7.

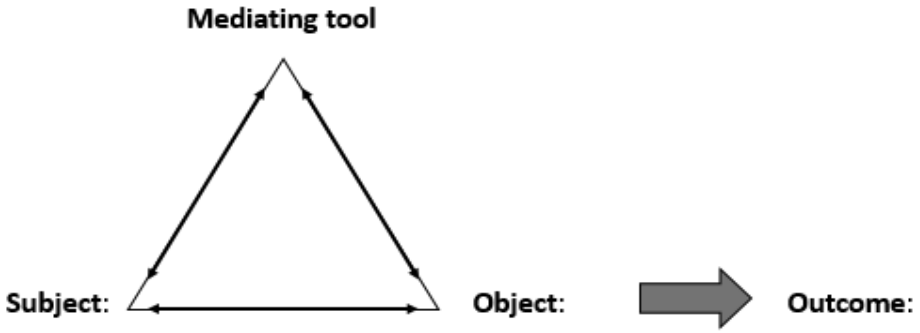


Figure 2.7: Vygotsky's triangle of mediated action

The **subject** is the person carrying out the activity; the **object** is that towards which the activity is directed and the **tools or mediators** are the means whereby the activity is achieved or accomplished (Waycott, Jones & Scanlon, and 2005:112). Engeström expanded Vygotsky's triangle of mediated action and adds three elements to the original triangle, namely **community, rules, and division of labour** (Waycott et al., 2005:112). The expanded triangle is shown in figure 2.8. A community consists of people who share the same goal whereas rules control the actions and interactions during the activity. The division of labour represents the way in which tasks are divided between members of the community and the more subtle but crucially important divisions and allocations of status and power (Uden, 2007:85).

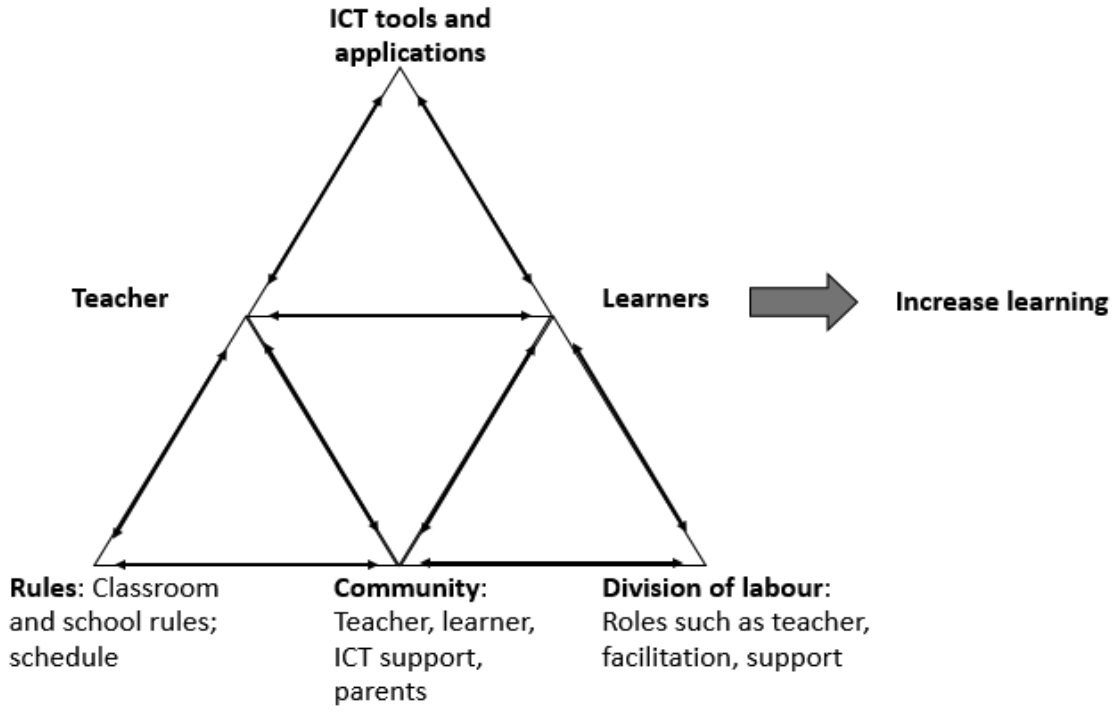


Figure 2.8: Engeström expansion of mediated triangle

To further explain the activity theory, Hasan and Kazlauskas (2014:1) say that the activity theory describes who is doing **what**, **why and how**. In addition, Hardman (2005) says the activity theory includes a group of people or a community sharing a common goal to change the object. Different education stakeholders in the activity theory work together as a team to achieve this intended goal.

For more information on the Activity Theory, watch the YouTube video clip (3:31 min) by either clicking on the link shown below or scanning the QR code shown in figure 2.9.

https://www.youtube.com/watch?v=jP2v6pzhCQw

Figure2.9: The Activity theory

2.4.2 Identify the components

One of the objectives of integrating ICT in the classroom is to enhance teaching and learning (Meenakshi, 2013). To do so, the Activity Theory can be used as a framework to plan and support the use of ICT. In order to understand the activity theory, you need to consider its components and the interaction between them. Figure 2.8 illustrates the following interrelated components, which achieve a common goal or objective: **tools, object, subject, rules, community and division of labour.** Within the context of integrating ICT in the classroom, the components according to Karasavvidis (2009) are elaborated below:

- Tools are equipment or resources that could be used to enhance teaching and learning.

- The subject may be regarded as a teacher or facilitator who should ensure the achievement of the set outcomes.
- The object may be regarded as a learner who is supposed to be offered learning opportunities; or the product that is supposed to be achieved.
- The rules embrace laws that can be used to stay focused on how to achieve the learning outcomes.
- A community includes all the stakeholders who are participating in the process.
- Labour is divided among all the stakeholders who have a role to play in the schooling of learners.

2.4.3 Application of the Activity Theory to ICT integration in teaching and learning

In the example of integrating ICT in education, the subject is the teacher and the object is a learner and performance. The mediating tools include available ICT tools in a school. The rules include the responsibility of the users of ICT tools (government, school and classroom). Examples of the community include all education stakeholders: learners, teachers, school management, ICT and parents. Finally, division of labour refers to the roles of the stakeholders and is distributed among teachers, school subjects, different units and modes of work (Karasivvidis, 2009; Lim, 2002).

When implementing ICT in your classroom, the activity system of a classroom forms part of the biggest activity system that have an influence on the implementation of ICT in a classroom environment. For example, the Minister of Education can make a decision on the specific ICT resources that teachers could use. Furthermore, policies can be enforced from the national education department that force teachers to participate in the use of ICTs in teaching and learning. Different layers of education stakeholders are expected to work together to achieve effective implementation of ICTs in teaching and learning. In order to illustrate the interdependence of the activity system, the following layered representation for the South African context was derived from the work of Lin (2002, 2003) and shown in figure 2.10.

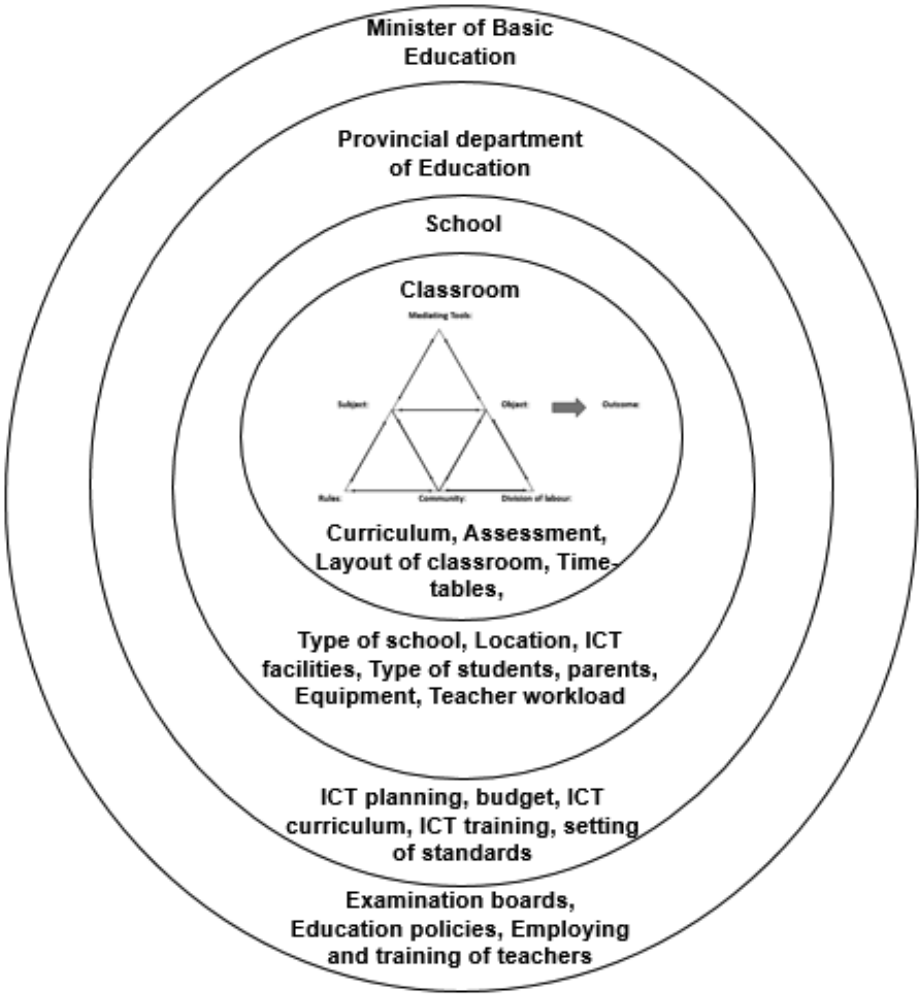


Figure 2.10: Activity system within the broader context



Activity

Teachers complained that learners do not bring their textbooks to class. Learners cannot complete their homework in the time allocated, because they do not have their books with them. In order to solve the problem, the principal in collaboration with the department of education, the school management team and the school governing body decided to buy tablets for each class. All the learning material has been loaded on the tablets. The tablets remain in the class and the learners can access the e-books while they are busy with their homework.

Identify all the components of the activity system mentioned in this example and add them to the activity system framework shown below.

Table 2.5: Activity system examples

Component	Examples
Subject	
Object	
Goal	
Tools	
Rules	
Community	
Division of labour	

2.5 PERSONAL REFLECTION

In this learning unit, we identified the role players and the kind of support they can offer when teachers integrate ICT in the classroom. Next, we discovered how the Activity Theory could be used as a framework to plan and implement ICT in your classroom. Please take some time and reflect on each section.

- What did you learn while working through the content?
  - The role players in supporting integration of ICT in education
  - The support available while integrating ICT in your classroom
  - The activity theory as a framework used to illustrate support in integrating ICT in classrooms
- What questions do you still have after working through the sections and how are you going to find help/assistance in this regard?
- What worked for you and what did not work for you; Why?

2.6 CONCLUSION

The focus was on the roles played by supporting self, learners and educators in their effective use of ICTs for learning. To do so, links to articles, websites and YouTube videos were provided to expose you to information relating to the topics.

Various role players are involved before, after and during the integration of ICT in education. Each role player has different responsibilities. Depending on the function or activity, the roles of these stakeholders can change. While integrating ICT, support is also provided throughout the process and a lack of support can have an impact on the success of such implementation.

The Activity Theory was explored to get a clear picture of a framework that can assist in planning, identifying role players and implementing ICT in the classroom. The components;

how they interlink and the roles they play were further investigated. Lastly, it was mentioned that an activity system does not exist in isolation and are interdependent on other systems.

2.7 MORE DOCUMENTS, IDEAS / WEBSITES TO VISIT

Topic	Link
Online education is the future of Africa	http://www.cavie.org/en/index.php/en/education/790-online-education-is-the-future-for-africa
ICT in Schools Department of education and science: Dublin	Stack, E. 2008 http://www.sdpi.ie/inspectorate/ICT_in_schools_insp_report.pdf
Kahoot	https://www.youtube.com/watch?v=ArQ-pju2UMc (1:21 min) https://www.youtube.com/watch?v=BJ3Er1-tCMc (2:01 min)
Technology acceptance model	https://www.youtube.com/watch?v=ydIFH1q2NHw (3:49 min)
Changing roles of teachers and students	https://www.youtube.com/watch?v=w6vVXmwYvgs (13:00min)

Learning Unit 3

Evaluate and update your ICT skills as necessary

3.1 INTRODUCTION

A variety of software is available for teachers to use ranging from operating systems to application software. Operating systems are the software needed to run your electronic device (computer, tablet or mobile phone), while application software is those that we download to perform a specific task. This application software range from those that you buy on shelves to those that you download for free. In some instances, the free software has limited capabilities and in other instances the full version is available to be used for free. For more information about various kinds of software and whether or not they are free, read chapter 3 in the book *Teachers discovering computers* (8th edition) by Gunter and Gunter (2015).

In this learning unit, the focus will be on specific ICT skills. For example, you will focus on how you can use word processing, spreadsheets, presentation slides and the internet to improve your own ICT skills and enhance your teaching. Although there is a variety of software available, we will base the content on Microsoft Office, in this learning unit. Microsoft Office is a product from Microsoft that bundles word processing, spreadsheet, presentation, database and email software together. For the purpose of this learning unit, the examples that are used will be based on Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Access and Internet Explorer.



Learning outcomes

At the end of this learning unit, you will be able to:

- Compile assignments and reports, by using word-processing.
- Use spreadsheets for doing calculations and compiling records.
- Develop and present slide shows for a range of audiences.
- Create a database for administration purposes.
- Upload and /or download information online, using appropriate software.

To inspire you to make use of technology, even under difficult circumstances, watch the following YouTube video clip concerning a teacher who improved learning through the use of technology. You can click on the link below or scan the QR code in figure 3.1.

https://www.youtube.com/watch?v=gxqsDc0yjgw

Figure 3.1: Improve learning through technology

3.2 WORD PROCESSING

The predecessor of word processing is the typewriter. Watch the YouTube video (7.51 min) about the reaction of children to a typewriter by selecting the link https://www.youtube.com/watch?v=vfxRfkZdiAQ or scan the QR code in figure 3.2.

Figure 3.2: Kids reaction to type writer

3.2.1 What is a word processing application program?

Word processing software is used to create, edit and format documents that mostly consist of text. This can, for example, be a letter, a question paper or an assignment. Therefore, if you type a letter, you will use the keyboard to enter the text (create). After entering the text, you will read it through and then correct the spelling, grammar or typing errors that you have made (edit). You will then decide to emphasise the headings, convert the text into a table or number the pages (format) to name a few examples. The process described above will be an example of word processing.

Watch the YouTube video (1.39 min) about word processing by selecting the link https://www.youtube.com/watch?v=mdyG2bDTb7I or scan the QR code in figure 3.3. What did you learn about word processing?

Figure 3.3: What is word processing

While working in a word processing application, you learn skills about how to type and edit documents. You can also apply these skills when typing a document in other applications. For example, when typing an email message, you also go through the actions to create, edit and format. So, the skills you have learned while using a word processor can be applied for many other applications.

For example, if you want to use Microsoft Word, you need to buy the software; install it on your computer and then register the software. After this has been done, you will be ready to type your first document. When you open Microsoft Word, the **landing** page (figure 3.4) will appear.

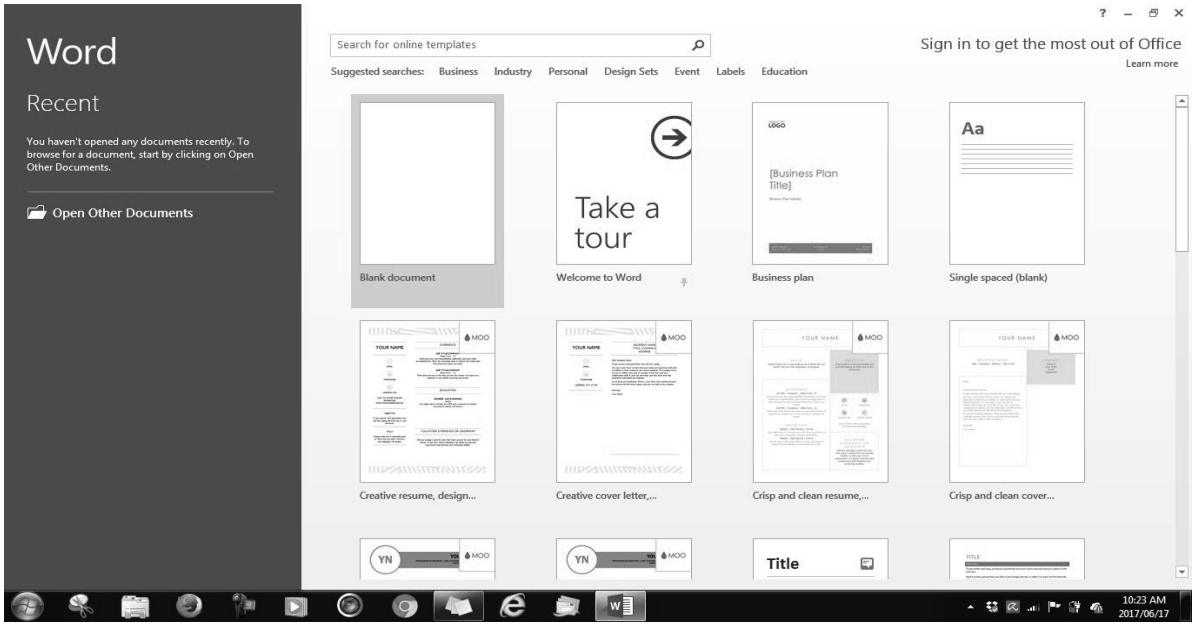


Figure 3.4: Microsoft Word landing page

To start working in Microsoft Word, you can either create a blank document; use an existing template to create a new document; or you can open an existing document. If you decided to select a blank document, the **application window** (figure 3.5) will appear.

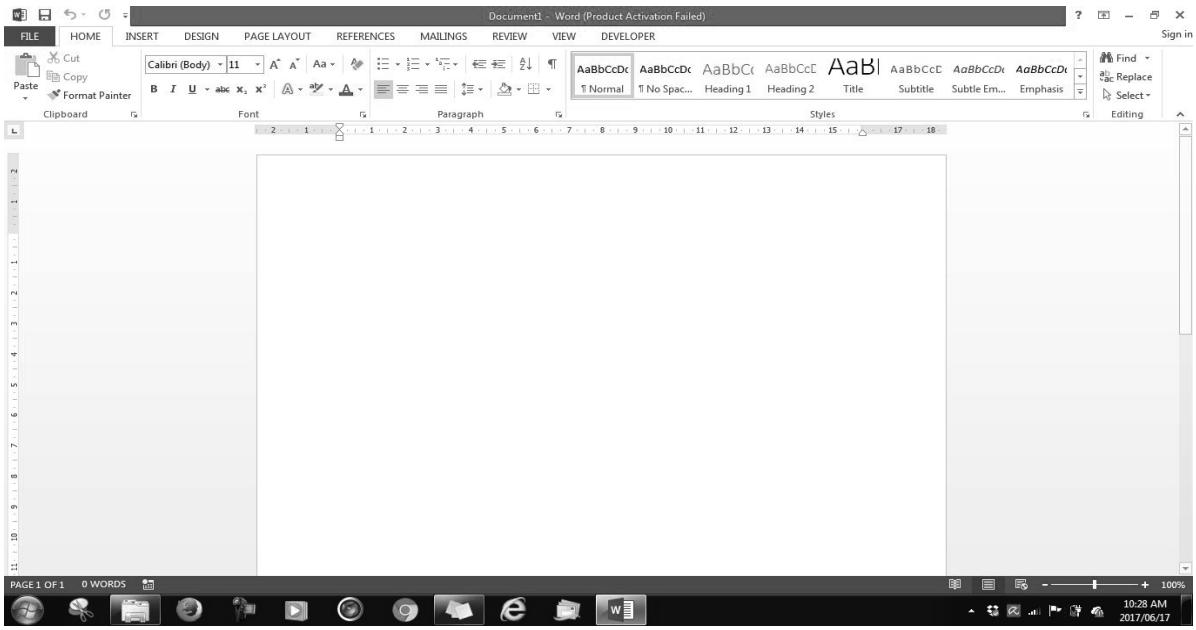


Figure 3.5: Microsoft Word application window

If you look at the top of the screen, you will see a series of ribbons or tabs. Each ribbon or tab is divided into groups and in each group you will find icons/shortcuts. See figure 3.6 below.

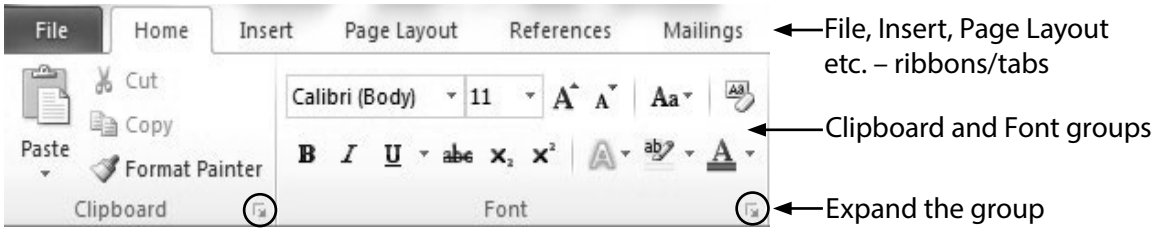


Figure 3.6: Window organisation

For the purposes of learning unit 3, the assumption is that you are familiar with MS Word. If not, or to further explore the use of Microsoft Word, scan the QR code below to watch the series of YouTube videos uploaded on the YouTube channel.

Select the link https://youtu.be/_fvWB2ALeSI?list=PLp4HvdggD657aJ49m59pyz

(2:22 min) or scan the QR code in figure 3.7.

Figure 3.7: MS Word tutorials

3.2.2 How do teachers use word processing in the classroom?

Today technology is freely available. It is not so long ago that the only device you could type on or use for word processing was the computer. Mobile devices are now so powerful that you can also do word processing on tablets and smartphones. For the purposes of this unit, you can use word processing on any device as long as you can use its full functionalities.



Discussion forum

By now you know that word processing is mainly used for typing documents. You also know that you can use a variety of devices such as laptops, tablets and smartphones. You also know that for the purpose of this unit, you need to use MS Word. In the discussion forum (MS Word in the classroom), give as many examples as possible of how you can use MS Word in your classroom. In addition, you can try out as many examples given on the discussion forum and comment whether or not they work in your environment.

Below, you will find a list of activities you can attempt to start using MS Word in your environment. Although there are many other ways to use MS Word, this will give you an indication and hopefully encourage you to use MS Word regularly in your classroom.



Activity 1

You need to type the question paper for the English First additional Language Grade 9 test. Use the Home ribbon, to format the front page of the test. The following MS Word functions were used:

(1) Bold and Centre text
(2) Use one of the existing styles (Heading 1)
(3) Capital letters, bigger font size
(4) Capital letters
(5) Insert a left tab stop
(6) Insert automatic numbers
(7) Remove numbering and indent text

An example of the layout of the front page (figure 3.8) is provided below.

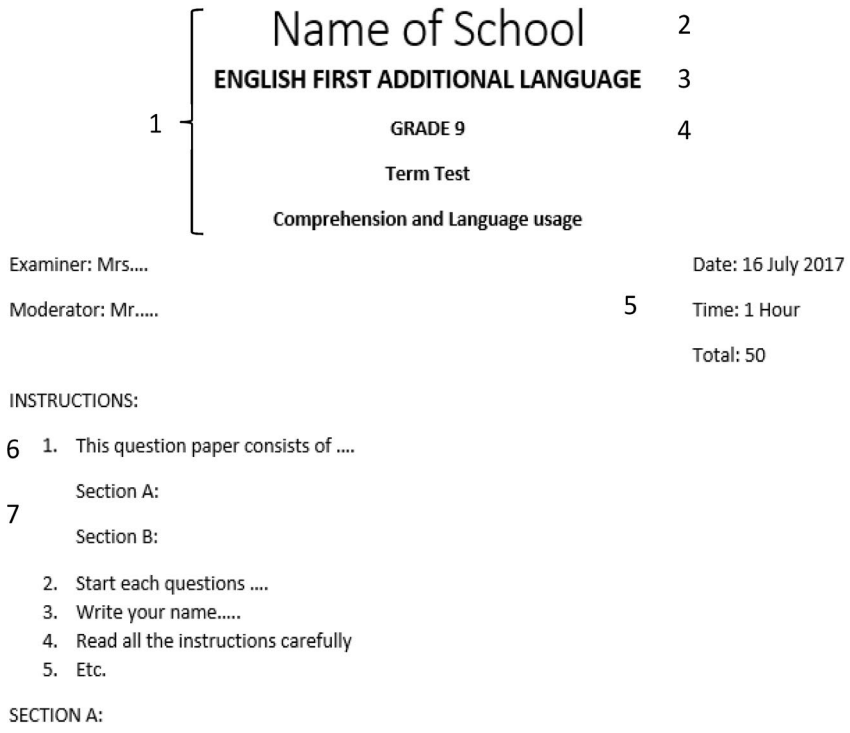


Figure 3.8: Activity 1 example

Activity 2

For the same question paper that you created in Activity 1, add the following:

(1) Insert a page break and type the heading: Section A: on the second page.
(2) Number the pages, starting from page 1.
(3) Insert a footer (Task 4: Term Test 2018) displayed at the bottom right hand side.
(4) Insert the school logo as indicated in figure 3.9, to the left and right hand side of the school name.

Name of School

ENGLISH FIRST ADDITIONAL LANGUAGE

GRADE 9

Term Test

Comprehension and Language usage

Figure 3.9: Activity 2 example

(1) Insert text from another document that you have already saved below the heading Section A, number the paragraphs (1 2 3 etc.) and draw a border around the inserted text.
(2) Insert any two multiple-choice questions for the comprehension test.

Activity 3

As part of the science test, you need to type a section of the periodic table. Use the Table function of MS Word to do it (take note, that you can also type this in MS Excel and copy the table to MS Word). Insert a table and use the following table layout functions:

(1) merge cells
(2) text direction
(3) text alignment
(4) remove lines
(5) column width

An example of the periodic table is given in figure 3.10.

2,1 1 **H** 1				
1,0 3 **Li** 7	1,5 4 **Be** 9			
0,9 11 **Na** 23	1,2 12 **Mg** 24			
0,8 19 **K** 39	1,0 20 **Ca** 40	1,3 21 **Sc** 45	1,5 22 **Ti** 48	1,6 23 **V** 51

Figure 3.10: Activity 3 example

Note: If you want to type the full periodic table, change the page orientation to landscape.

Activity 4

In the Economic and Management Science question paper, you want to ask a question about the circular flow of income. Create a diagram similar to the one shown in figure 3.11 (use any picture to represent the household / firm, or create the picture from shapes):

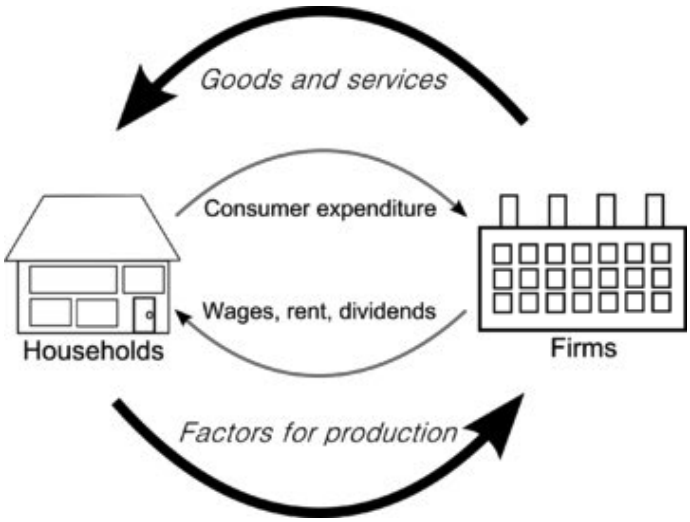


Figure 3.11: Activity 4 example (https://en.wikipedia.org/wiki/Circular_flow_of_income)

(1) Insert arrows, copy, rotate and change the outline and colour of the arrows.
(2) Insert text boxes and remove the borders.
(3) Group the objects.

Activity 5

When setting a test, you need to make sure that the test is free of errors. Read the document that you have typed so far and check and correct the spelling mistakes.

> ***Note***: If you have moderated a test, use comments (Review ribbon, new comment) to add comments in the margin area or activate track changes (Review ribbon, track changes) so that the changes that you made are visible to the next reader.



Scenario

Your school decided to have a big festival. They established a small committee and they realised that not only schoolchildren will be involved, but also the parents and the local business people. Since not everybody is linked to the D6 communicator or the electronic communication systems of the school, they have to send out printed letters to the business people. The committee decided during their committee meeting that the following needs to be done:

(1) Letters should be send out to the business people in the community to inform them of this huge fundraiser project and ask them whether they will be prepared to sponsor any prizes for a lucky draw.
(2) Posters need to be designed that will be put up at the library, church and local shops in and around the school.

(3) They also decided that they would work with a cashless system, so tickets need to be designed and printed which the people will have to buy and use as 'money'.

Use the scenario above and create the following documents for your own school / environment. For example, you need to type a letter; make a poster (use graphics and colours) and use a table / labels to create your money. Examples of these documents can be found at the end of the module.



DIY box

Create a lesson plan for your subject and save it as a MS Word template. To help you, watch the YouTube video (3:58 min) by selecting the link https://www.youtube.com/watch?v=bgTrXI-MROc or scan the QR code shown in figure 3.12.

Figure 3.12: Lesson plan template



Additional discovery

Microsoft 2016: Comprehensive guide to Word for anyone (32 Modules, 2h10 min). To watch the YouTube video, select the link https://www.youtube.com/watch?v=TxLuuNprjXg or scan the QR code shown in figure 3.13.

Figure 3.13

3.3 USING SPREADSHEETS IN THE CLASSROOM

When using a word processor, the focus is on creating a document by typing and editing text. However, when you create a spreadsheet workbook, the focus is on entering numbers.

3.3.1 What is a spreadsheet application program?

Spreadsheet application programs are designed for working with numbers. Not only do you enter numbers, but you also do a variety of calculations and make graphical representations of the numbers. Another aspect of a spreadsheet application that differs from a word processing application is the appearance of the edit screen. In a spreadsheet workbook the screen is divided into rows and columns (like a table) while in the Word processor it is a blank screen.

The spreadsheet application that forms part of Microsoft Office is called Microsoft Excel. So the examples in this learning unit are based on Microsoft Excel. When you open Microsoft Excel, the **landing** page (figure 3.14) will appear.

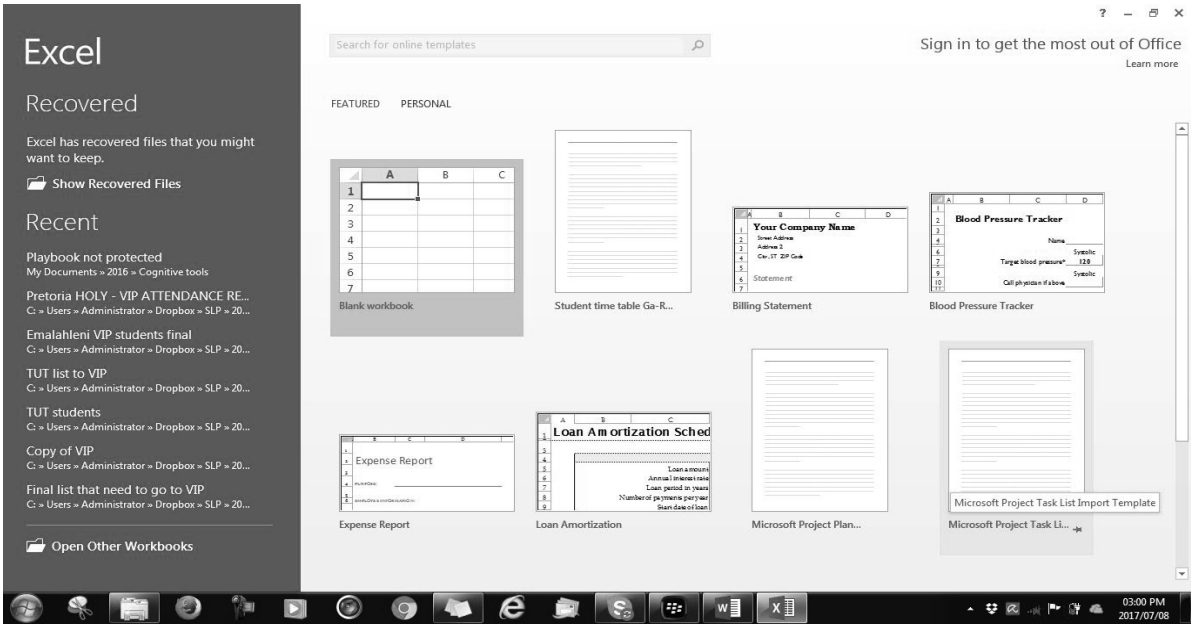


Figure 3.14: Microsoft Excel landing page

To start working in Microsoft Excel, you can either create a blank workbook; use an existing template to create a new workbook; or you can open an existing workbook. If you decided to select a Blank workbook, the **application window (**figure 3.15) will appear.

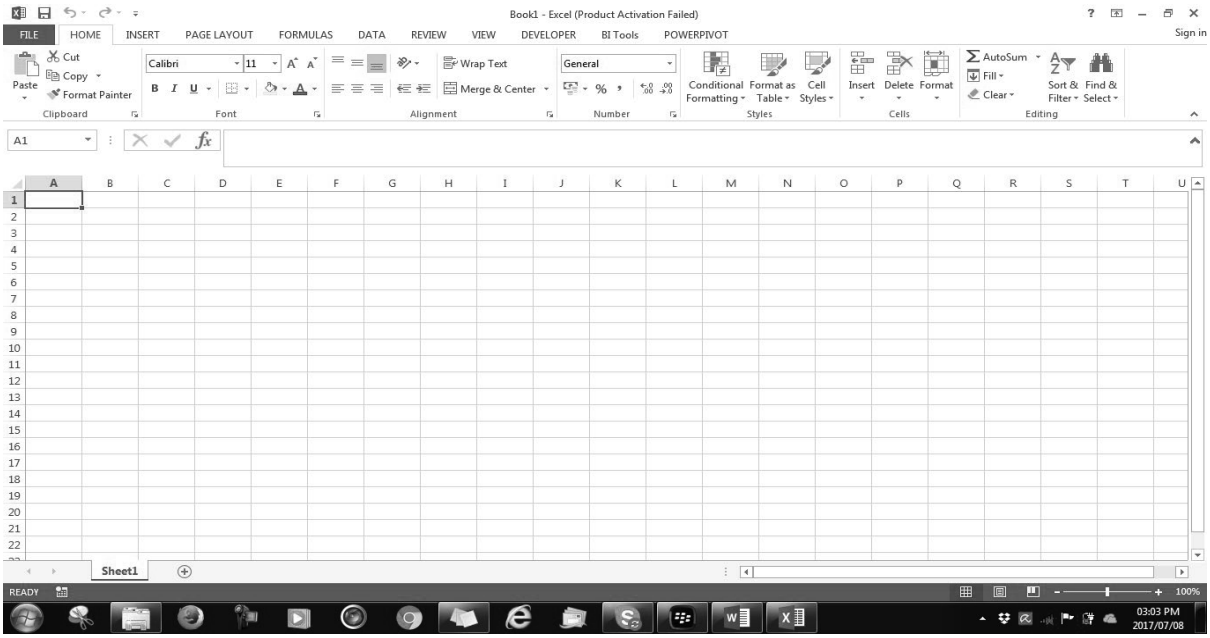


Figure 3.15: Microsoft Excel application window

You will see that the workbook is divided into rows and columns. The rows are numbered starting from one (press Ctrl+Down arrow to see the last row) and the columns starting from A (press Ctrl+Right arrow to see the last column). Where a row and a column meet, it is called a cell; and each cell has an address. For example, A1 means column A, row 1 and M20 means column M row 20.

If you look at the upper part of the screen, you will see a series of ribbons or tabs at the top. Each ribbon or tab is divided into groups and in each group you will find icons/ shortcuts. This is shown in figure 3.16 below.



Figure 3.16: Window organisation

For the purposes of this qualification, the assumption is that you are familiar with MS Excel. If not, or to further explore the use of Microsoft Excel, watch the videos that has been uploaded on myUnisa or scan the QR code below to watch the series of YouTube videos uploaded on the YouTube channel.

Figure 3.17: MS Excel

Select the link https://www.youtube.com/playlist?list=PLp4HvdggD654wfOvKuxL_TNS2NQjplvyb or scan the QR code shown in figure 3.17.

3.3.2 How can teachers use spreadsheets as enablers in teaching and learning?

Mobile devices are so powerful that you can also use spreadsheet applications on tablets and smartphones. For the purposes of this unit, you can use MS Excel on any device as long as you can use its full functionalities.



Discussion forum

You know by now that spreadsheet documents are mainly used for doing calculations and typing information in a graphical way. You also know that you can use a variety of devices such as laptops, tablets and smartphones. You further know that you need to use MS Excel for the purpose of this unit. Give as many examples as possible of how you can use MS Excel in creative new ways in your classroom in the discussion forum (MS Excel in the classroom). In addition, try out as many of the examples given by other students on the discussion forum and comment whether they work in your environment or not.

Below, you will find a list of activities that you can attempt to start using MS Excel in your environment. Although there are many other ways to use MS Excel, this will give you an indication and hopefully encourage you to use MS Excel regularly in your classroom.



Activities

Activity 1

Create a class list where you can capture the following:

(1) Learner details, for example, learner number, surname, first name

(2) Column for each day of the week (to capture the information for a term, add enough columns for everyday of the term, but hide / unhide the columns not necessary. In this way, all the columns are not displayed at once). In this column you are going to add the test marks of the daily spelling tests.
(3) For the Total weekly mark column, you need to add up all the individual test marks (use the SUM function). For example, the Total weekly mark column will be calculated as follows: =SUM(E3:I3).
(4) Use a function (COUNT) to calculate the number of students that wrote the test.
(5) Use a function (AVERAGE) to calculate the average mark per test per day. An example of the spreadsheet mentioned above is shown below in figure 3.18.

Class list: Spelling test

Number	Student #	Surname	Name	Mon T1	Tue T2	Wed T3	Thu T4	Fri T5	Total weekly mark
1	S1	A	A	15	14	15	13	12	=SUM(E3:I3)
2	S2	B	B	13	11	9	12	10	
3	S3	C	C	12	15	12	12	10	
4	S4	D	D	15	15	15	12	15	
5	S5	E	E	14	14	14	11	15	
6	S6	F	F	9	13	14	14	9	
Number of learners that wrote the test				=COUNT(E3:E8)					
Average test mark per day				=AVERAGE(E3:E8)					

Figure 3.18: Spelling test class list

Activity 2

Use MS Excel to create a chart to show the learner's mark distribution for each test. If you want to also include the average mark per learner, you first need to calculate it. See the example shown in figure 3.19 of the added Average mark column and the column chart.

Class list: Spelling test

Number	Student #	Surname	Name	Mon T1	Tue T2	Wed T3	Thu T4	Fri T5	Total weekly mark	Average mark
1	S1	A	A	15	14	15	13	12	69	13.8
2	S2	B	B	13	11	9	12	10	55	11
3	S3	C	C	12	15	12	12	10	61	12.2
4	S4	D	D	15	15	15	12	15	72	14.4
5	S5	E	E	14	14	14	11	15	68	13.6
6	S6	F	F	9	13	14	14	9	59	11.8
Number of learners that wrote the test				6	6	6	6	6		
Average test mark per day				13	13.667	13.1667	12.333	11.83		

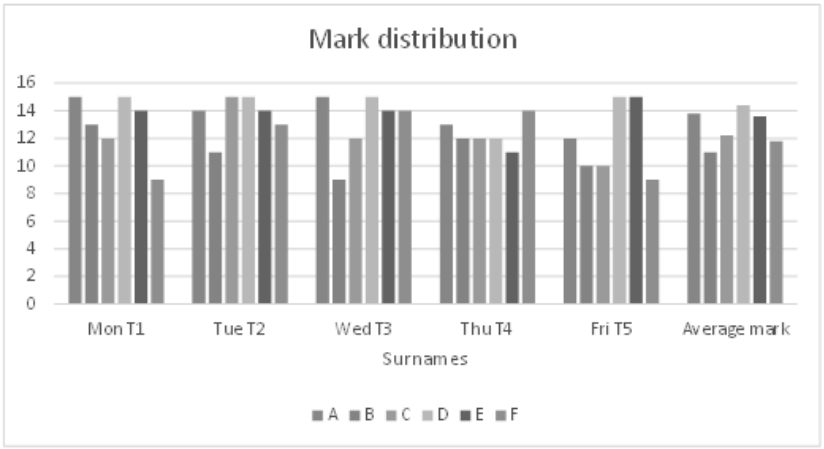


Figure 3.19: Chart of mark distribution including average mark



Scenario

Your school has decided to have a big festival. After the festival, you need to compile the income and expenses statement to determine the profit for the day. Use Excel and include the following:

(1) Income: ticket sales (300 preschool children at R5 per child; 250 school children from neighbouring schools at R10 per child; 750 adults at R30 per person)
(2) Income: 25 flea market stalls at R150 per stall
(3) Income: R500 000 from the food stalls (parents)
(4) Income: 1000 wrist bands sold at R60 each to access merry-go-round
(5) Income: Roman pizza sales = R100 000 and the school gets 15% of the sales.
(6) Expenses: merry-go-round hire: R30 000
(7) Expenses: Other entertainment R25 000
(8) Expenses: Other material (tents etc.) R75 000
(9) Expenses: Electrical equipment R35 000
(10) Expenses: Food stall ingredients R35 000

Use MS Excel to create the statement. Start with the income items first, followed by the expenses. Work out a total for the income, as well as for the expenses. To calculate the profit, deduct the expenses from the Income. Examples of this spreadsheet can be found at the end of the module.



DIY box

After your learners have written tests, the marks need to be captured. In this example you can experiment with more advanced functions such as IF and COUNTIF. Create a mark sheet to capture the marks of your learners. Also include the total of learners that wrote the test; the number of learners that were absent; the average of the test; the number of learners that were incompetent, competent or obtained a distinction. The following calculations were done in the example shown below in figure 3.20:

(1) The weights above each task column were used to calculate the mark. All the percentages were added together.
(2) An IF statement were used to determine the level for each test (in this example, the promotion level 1 – 7 were used).
(3) A COUNTIF statement were used (assumption was made that if the mark is 0 the learner was absent) to calculate the number of learners that were absent.
(4) The average function was used (take note that average is calculated of the entered marks, the blank spaces are not taken in consideration) to calculate the average task mark.
(5) COUNTIF was used to determine how many learners were incompetent, competent or obtained a distinction.

Mark sheet

				10%	20%	10%	20%	10%	30%		
Number	Student #	Surname	Name	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Mark	Level
1	S1	A	A	80	75	55	60	84	71	70.2	6
2	S2	B	B								
3	S3	C	C								
4	S4	D	D								
5	S5	E	E								
6	S6	F	F								

Number of learners who wrote the test	1	1	1	1	1	1	1	1
Number of learners that were absent	0	0	0	0	0	0	0	0
Average	80	75	55	60	84	71	70.2	6
Not competent								0
Competent								1
Distinction								0

Task 1 - 10%; Task 2 - 20 Task 3 - 10%; Task 4 - 20%; Task 5 - 10%; Task 6 - 30%;

Figure 3.20: Mark sheet with advance functions



Additional discovery

Microsoft Excel 2016–Learn Excel 2016 Beginners (2h 08 min). To watch the YouTube video select the link https://www.youtube.com/watch?v=tuk99Sgc6Fw or scan the QR code shown in figure 3.20.

Figure 3.20: Microsoft Excel

3.4 PRESENTATION SOFTWARE

Presentation software is used to develop and present slide shows for a range of audiences. Examples of Presentation software are MS PowerPoint, Prezi, PowToon, Google slides and many more.

3.4.1 What is a presentation application programs?

Presentation software is mainly used to create a slideshow. The purpose of a slideshow is to provide the audience with an overview of the presentation. The presentation is divided into slides on which you can enter text or objects. These objects can be in the form of pictures, audio or videos. You can also add movement (animation) to the objects.

The skills that you have learned using MS Word and MS Excel can be applied when entering text and objects in MS PowerPoint. You need to buy the software; install it on your computer and then register the software to use Microsoft PowerPoint. After this has been done, you will be ready to create your slideshow. When you open Microsoft PowerPoint, the **landing page** (figure 3.21) will appear.

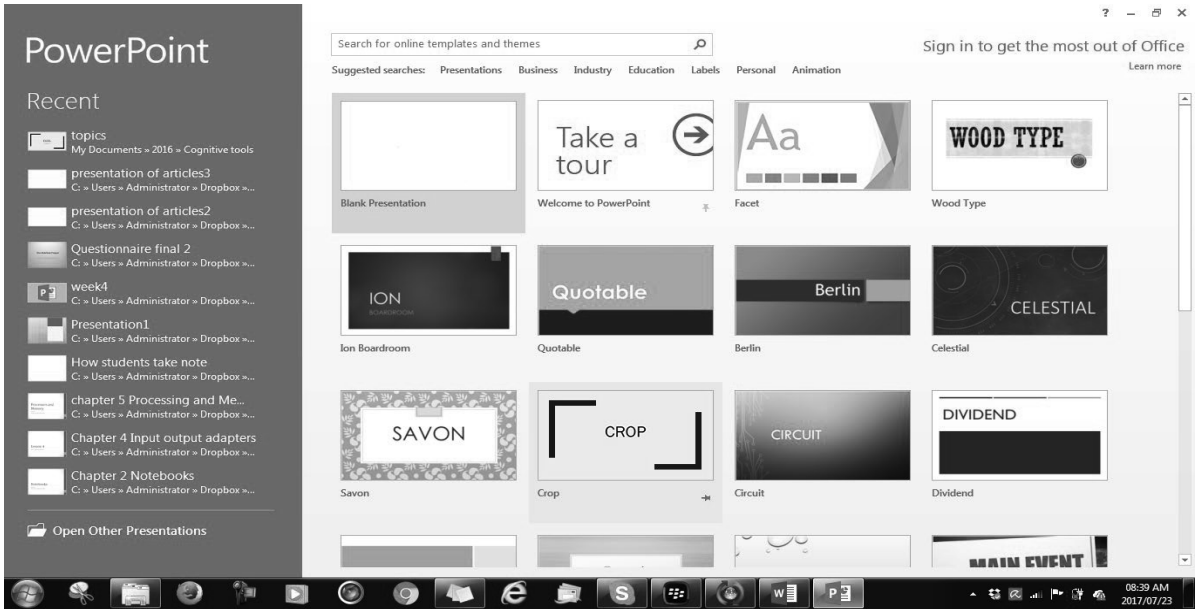


Figure 3.21: MS PowerPoint landing page

To create a presentation, you can either start with a blank presentation; use an existing template to create a new presentation; or you can open an existing presentation. If you decided to select a blank presentation, the **application window** (figure 3.22) will appear.

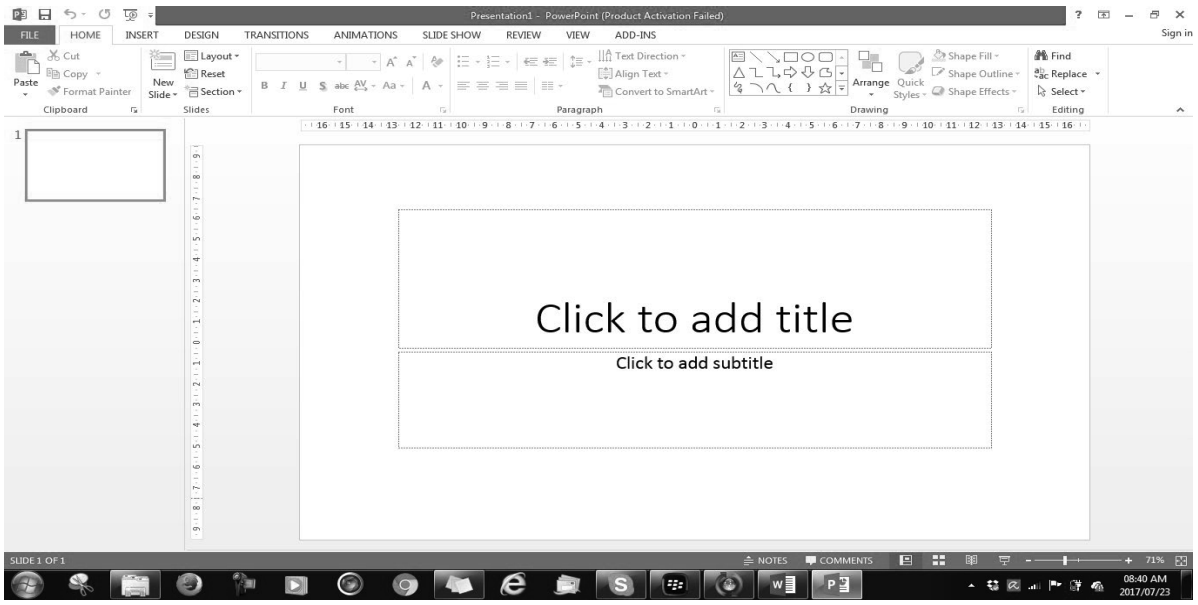


Figure 3.22: MS PowerPoint application window

If you look at the top of the screen, you will see a series of ribbons or tabs. Each ribbon or tab is divided into groups and in each group you will find icons/shortcuts. This is shown in figure 3.23 below.

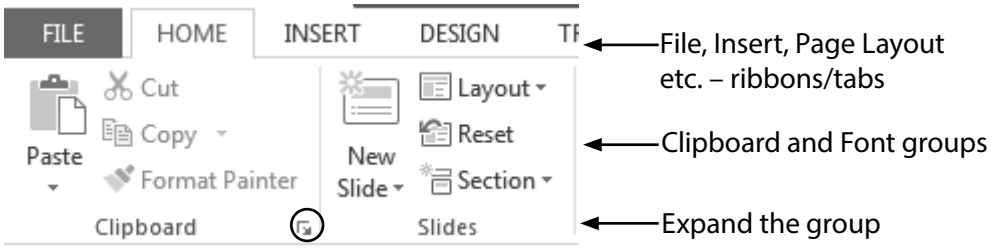


Figure 3.23: Window organisation

For the purposes of this qualification, the assumption is that you are familiar with MS PowerPoint. If not, or to further explore the use of Microsoft PowerPoint, watch the videos that have been uploaded on myUnisa; or scan the QR code below to watch the series of YouTube videos uploaded on the YouTube channel.

Select the link https://www.youtube.com/playlist?list=PLp4HvdggD655NG1ZLqSRcj6gSfz0k9bV3

or scan the QR code shown in figure 3.24.

Figure 3.24: PowerPoint tutorial

3.4.2 Develop and present slide shows for a range of audiences

There are several ways to use MS PowerPoint in the classroom. You can watch the following videos to get more ideas to use MS PowerPoint.

Click on the link, https://www.youtube.com/watch?v=BtDovMwpIYY (19:31 min) or scan the QR code shown in figure 3.25:

Figure 3.25: 15 Ways to use PowerPoint in the classroom

When creating a slideshow, the presenter needs to be cautious not to distract the audience but rather to engage them. Therefore, the presenter makes use of colours, pictures and animations to captivate the attention of the audience. However, there are certain rules with regard to the following that needs to be followed:

- font
- colours
- movement
- amount of text

Watch the following YouTube video clips to learn about what to keep in mind when creating a MS PowerPoint presentation. To watch the YouTube video clip: Presentation skills: Death by PowerPoint, you can click on the link mentioned below or scan the QR code shown in figure 3.26.

Figure 3.26: Death by PowerPoint

https://www.youtube.com/watch?v=fapnvvBfvIU (3:03 min)

To further assist you to develop best practices when creating your MS PowerPoint presentation, you can watch the YouTube video clip: "Four scientific reasons why your

PowerPoint presentation is bad" by selecting the link https://www.youtube.com/watch?v=eLGLtnRopJM (2:56 min) or scan the code shown in figure 3.27.

Figure 3.27: Four Scientific reasons why your PowerPoint presentation is bad



Discussion forum

You know by now that slideshows are used to provide audiences with information during a presentation. However, these slideshows often bore the audience to death. After watching the two videos above, make a list of things that you need to avoid when creating a slideshow; also mention why you need to avoid it. For example, the font size needs to be big enough so that the person at the back of the room can also read it.

Below, you will find activities you can attempt to start using MS PowerPoint in your environment. Although there are many other ways to use MS PowerPoint, this will give you an indication and hopefully encourage you to use MS PowerPoint regularly in your classroom.



Activities

Activity 1

The challenge is to plan a slideshow about any topic of your choice. Tell your story by only using pictures (you can draw the slides on paper or on MS PowerPoint). Show your planning to a colleague / student to test if your message is clear.

Activity 2

The challenge is to create a slideshow that will grab and hold the attention of your learners. Take the video clips that you watched into consideration and create an interactive slideshow on any topic of your choice. In this presentation the use of text needs to be limited to a few words here and there (take into consideration how much information your brain can process at a given time). Try to find pictures that illustrate concepts; and if you need to use text, make use of different colours. Also, keep the following in mind:

(1) Title slide (introduce the topic and menu structure of the lesson).
(2) Use appropriate background, fonts, sizes and animations.
(3) Introduce the content in an interactive way where students can move freely between slides. Keep in mind the best practices of creating a presentation when you enter content on the slides. Watch the YouTube video by selecting the link https://www.youtube.com/watch?v=6lj2dioV3oQ (4:12 min) or scanning the QR code in figure 3.28.

Figure 3.28: 4 minute teacher tip

Activity 3

Create a quiz in PowerPoint. You can use the same topic that you used in activity 1 or 2. You can watch the YouTube video by selecting the link https://www.youtube.com/watch?v=Z50My6to14s (23:53 min) or scanning the QR code shown in figure 3.29, for ideas on how to create a quiz in MS PowerPoint. Create at least two questions with feedback slides.

Figure 3.29: Create an interactive quiz in PowerPoint



Scenario

Create an interactive slide show with quizzes/games in between. To do so, use the following as a guide:

(1) Select any topic of your choice.
(2) Take into consideration the video clips that you have watched and how much information the brain can process at a given time (do not put too much information into a slide; rather create a new slide).
(3) Create any game (for example, Hide and reveal or a memory board game) to test these two concepts.



Additional discovery

PowerPoint tricks: To watch the YouTube video select the link https://www.youtube.com/watch?v=05OW0Ce8rT8 (4:47 min) or scan the QR code shown in figure 3.30.

Complete the tutorial by using PowerPoint: To watch the YouTube video, select the link https://www.youtube.com/watch?v=Ibc1HX8Jccw (2 hours 10 min) or scan the QR code shown in figure 3.31.

Figure 3.30: PowerPoint tricks

Figure 3.31: Complete PowerPoint tutorial

3.5 DATABASE

A database is a collection of information or data organised in a specific way. It gives you easier access to your data. Examples of popular database applications include MS Access, Oracle and Quickbase. For more examples, read the article provided at the following link: https://www.quickbase.com/articles/database-software-basics

3.5.1 What is a database application program?

A database application program allows you to create an organised structure in which you can add information. After you have added the information, you can change or edit the information; extract or

Figure 3.32: What is a database

retrieve information and search for information. In order to learn what a database is, watch the YouTube video (1.41 min) by selecting the link https://www.youtube.com/watch?v=cA4c0yda8Hs or scan the QR code in figure 3.32.

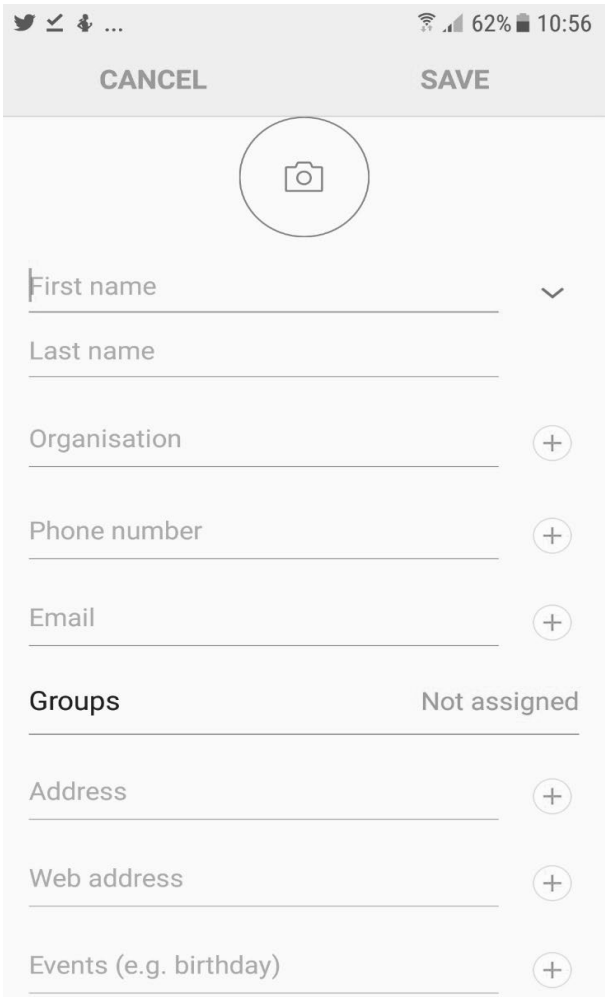


Figure 3.33: Contact list

Another example of a database that you use every day is the contact list on your mobile phone (see figure 3.33). All the information displayed in figure 3.33 belongs to one person. This is called a record; and a record consists of fields. Can you identify the various fields? (If you guess First name, last name etc., you are right.) In other words, the information that belongs to one person is called a record.

To enter a new contact in the contact list, you have to fill in the form. You will see that you can enter different kinds of information like names, email addresses, phone numbers and birthdays in different formats such as plain text, numbers and dates. This is called the fields.

After you have entered the information of one person, you can save it and add information of another contact. You can also edit the information of a contact, search for a contact and delete a contact. The actions listed above are the characteristics of a database. For a more detailed description of database concepts and principles, watch the following four tutorials on YouTube.

(1) **What is a database?** https://www.youtube.com/watch?v=45w9UraAsmQ (1:46)	
(2) **Table columns and data types:** https://www.youtube.com/watch?v=Zpi2GLJgJzI (3:09)	

(3) **References:** https://www.youtube.com/watch?v=skHBFfw05Oo (6:02)	
(4) **How to start creating a database model:** https://www.youtube.com/watch?v=DYH-GwMGdb8 (1:59)	

In order to use a database application like Microsoft Access, you need to buy the software; install it on your computer and then register the software. After this has been done, you will be ready to create your first database. When you open Microsoft Access, the **landing** page (figure 3.34) will appear.

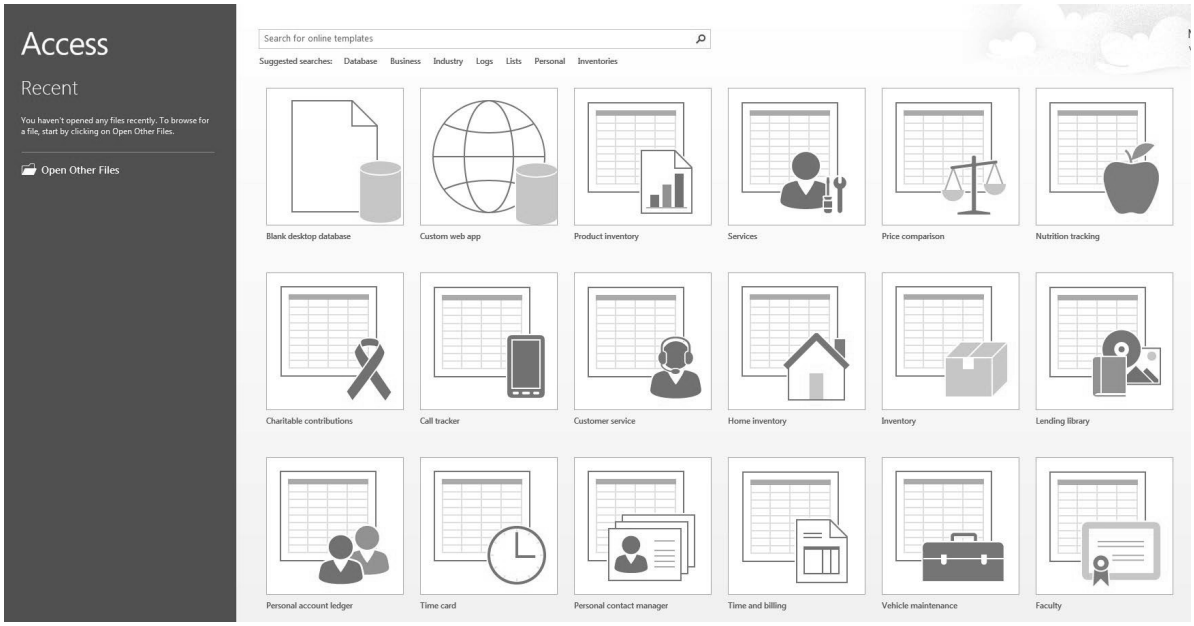


Figure 3.34: Access landing page

To create a new database, you can either create a blank desktop database; use an existing template to create a new database; or you can open an existing database. If you decided to select a blank desktop database, the following (figure 3.35) will appear.

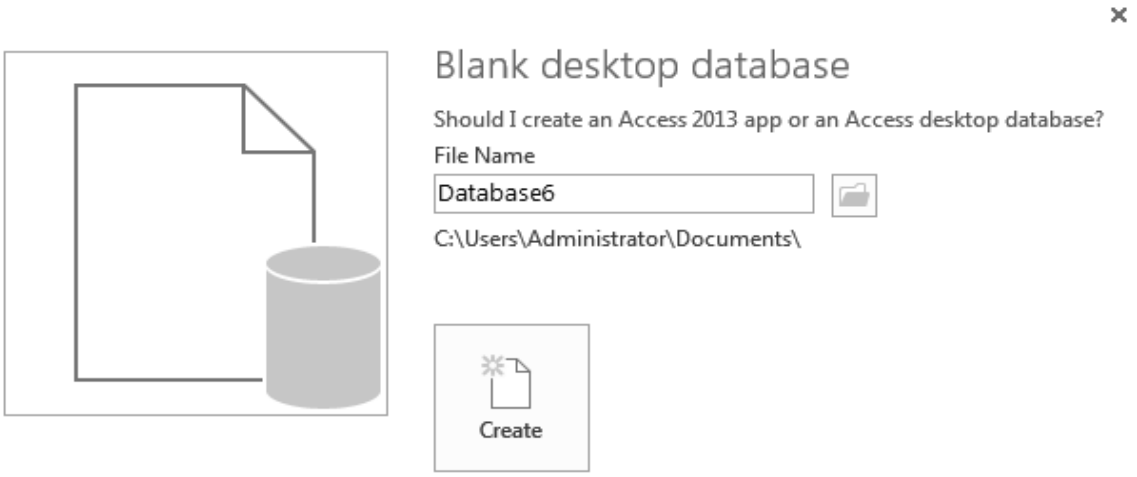


Figure 3.35: Blank database

Enter the name of the new database and select the location where the database will be stored or saved. Click on 'Create' and the following application window will appear (figure 3.36):

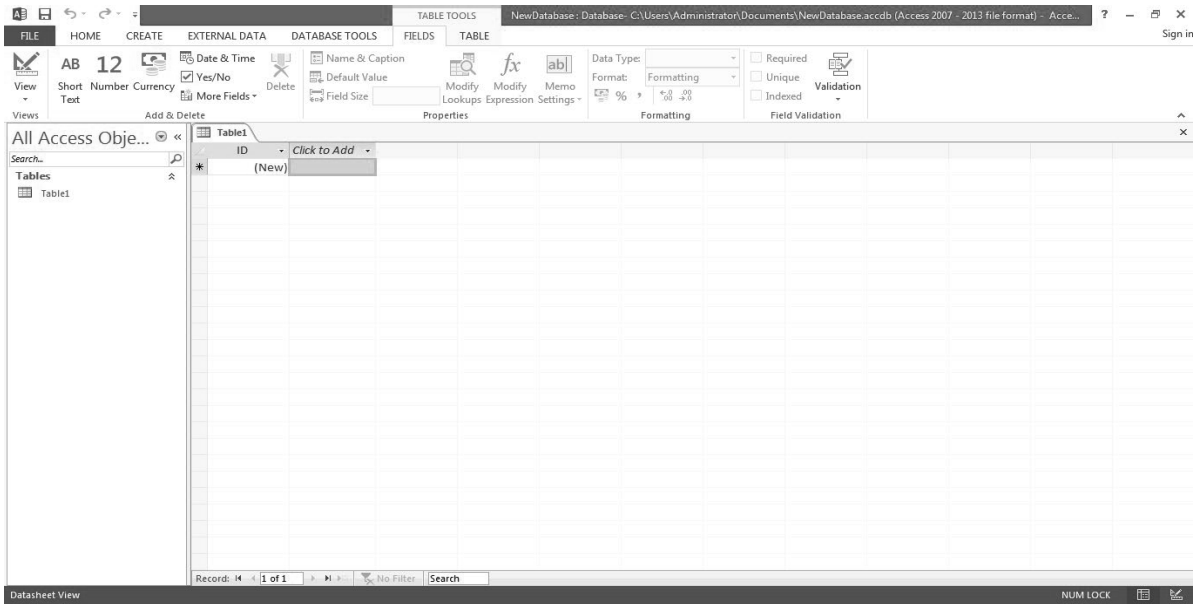


Figure 3.36: Application window

If you look at the top of the screen, you will see a series of ribbons or tabs. Each ribbon or tab is divided into groups and in each group; you will find icons/shortcuts. This is shown in figure 3.37 below.

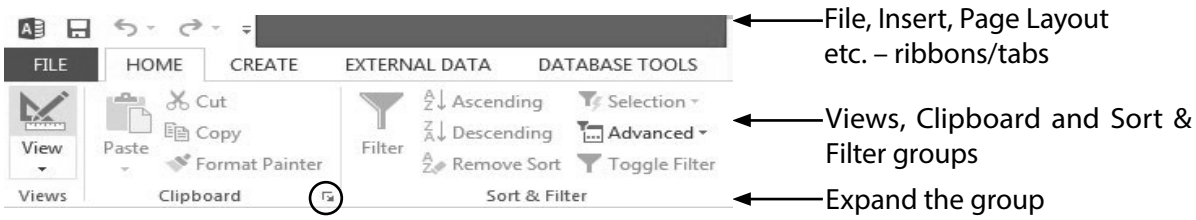


Figure 3.37: Window organisation

The basic objects you will create in a database are a table, query, form and a report. To see more detailed information, watch the series of YouTube videos by either selecting the link https://www.youtube.com/watch?v=x2ky_SdvOtM&index=1&list=PLpQQipWcxwt-IWBqprrYVk53qPo53ZxMw or scanning the QR code shown in figure 3.38. This link will take you to a playlist of 22 short videos about various MS Access-related topics.

Figure 3.38: Access tutorial

If you rather want to read than watch a video, click on the link below.

https://www.reading.ac.uk/web/files/its/AccessEssen2013.pdf

3.5.2 How can teachers use a database application for administration purposes?

Teachers can use a database in a variety of ways, but the most obvious one is to enter the biographical details of the learners or the parents and the marks; and print the progress reports. Although MS Access has many advanced functions, in our examples we will only focus on **basic** tables, relationships, queries, forms and reports.



Discussion forum

(1) Watch the YouTube video "What is a database?" by selecting the following link https://www.youtube.com/watch?v=5h-tEd8kwrE (0:47) or scanning the QR code shown in figure 3.39. After watching the video clip, identify the different examples of popular databases mentioned in the video and enter the examples in the discussion forum. Can you think of any other databases that are commonly used? Also mention it in the discussion forum.

Figure 3.39: What is a database



Activities

In the following activities, you need to use the knowledge that you have gained from watching the YouTube videos mentioned in section 3.5.1

Activity 1: Planning the table:

In the beginning of the year, all the learners need to complete the following form.

Learner number:			
Surname:		**Name:**	
Date of birth:		**Grade:**	
Home Address:		**Postal address:**	
City:		**City:**	
Code:		**Code:**	
Father:		**Mother:**	

Contact nr:		**Contact nr:**	
Medical aid:		**Medical aid nr:**	

In this activity, you are going to use Access to record the information. You can use the table below to answer the questions:

Field name	**Type**	**Properties**

(1) List all the fields you are going to need.
(2) Determine the type (for example text, numbers, dates etc.); and the properties of each field, if necessary).

Activity 2: Creating the table and enter data

(1) Create a table (biographical details) based on the fields, types and properties listed above.
(2) Enter data for each one of the fields (fictitious). Make sure that you enter the learner details for at least Grade 5, Grade 6 and Grade 7.

Activity 3: Working with queries

(1) Create a query to display all the Grade 7 learners.
(2) Save the query so that it can be used as input for a report.

Activity 4: Create a basic report

Create a report to show the information of the Grade 7 learners.

(1) Show all the fields except the medical aid fields.
(2) Sort the information alphabetically according to their surnames.
(3) The title of the report is "Grade 7 learners"



Scenario

The headmaster of the school decided to use MS Access to print the reports of the Grade 7 learners. To do so, all the information about each learner in Grade 7, needs to be entered. Information such as learner number, surname, names, grade, subjects, mark for each subject, feedback and Final Mark, need to be entered. Use the knowledge that you have gained by doing activity 1–4, and assist the headmaster to create the reports by:

(1) Creating the table with all the necessary fields. Make sure you select the correct type.
(2) Using a query, to add and calculate the final mark. In this example, the final mark will be the average of the test marks.
(3) Using the query created in question 2 as input to the report. Use Report designer to create the report that will display the learner details, all the subjects, marks, feedback and the final mark.



DIY box

In addition to what has been done in the activities and scenario above, explore how to create a form. If you need additional knowledge, watch the YouTube videos about creating forms https://www.youtube.com/watch?v=dEaQIrw3CZY&list=PLpQQipWcxwt-IWBqprrYVk53qPo53ZxMw&index=20 (4:12). After watching the video clips, create a form for the database created in activity 1 and 2 that can be used for entering information into the database. For more detailed information about customising forms, watch the following two YouTube videos.

Customise form settings: https://www.youtube.com/watch?v=T8QBDc1o-mo&list=PLpQQipWcxwt-IWBqprrYVk53qPo53ZxMw&index=21 (3:28)

Formatting forms: https://www.youtube.com/watch?v=5MMLzgfNSlU&index=22&list=PLpQQipWcxwt-IWBqprrYVk53qPo53ZxMw (4:23)



Additional discovery

Customise the quick access toolbar to display an icon for "Datasheet view". For more information to do it, watch the following YouTube video: https://www.youtube.com/watch?v=m5oDxl9TVTU (5:27)

3.6 THE USE OF INTERNET AND WWW

The internet and World Wide Web (WWW) represent one of today's most exciting networks. Companies, government, universities and people publish information on websites (Gunter & Gunter, 2015). Nevertheless, what is the internet and the WWW?

3.6.1 Define internet and WWW

According to the internet society,[1] it is not easy to define the internet since it is shaped and moulded as you use it; but importantly, it is used to connect people and groups of people all over the world. Because the

Figure 3.40: History of Internet

1 http://www.internetsociety.org/internet/what-internet [Accessed 20 July 2017]

internet connects people, it creates opportunities to share information and collaborate. You can read more about the history of the internet on the internet Society website by either selecting the link https://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet or scanning the QR code shown in figure 3.40.

In addition, the Web or WWW is a collection of websites that you can access through the internet. In order to view websites, you need a web browser to be able to read the websites[2].

Watch the following two YouTube videos to learn more about the internet.

What is the internet: select the link https://www.youtube.com/watch?v=Dxcc6ycZ73M (3:34 min) or scan the QR codes shown in figure 3.41.

How does the internet actually work: select the link https://www.youtube.com/watch?v=ZonvMhT5c_Q (3:44 min) or scan the QR code shown in figure 3.42.

Figure 3.41: What is the Internet?

Figure 3.42: How does the Internet actually works?

3.6.2 Search for information

Nowadays there is barely a topic on which you cannot find information online. To find out the meaning of a word; look for the lyrics of a song; or determine how a device works, people often use Google to search for the information. This is also a tool teachers can use with great success. However, content always needs to be tested to determine if it is correct. To search for information, you need to install a web browser such as Mozilla Firefox, Google Chrome, Microsoft Internet Explorer, Apple Safari or the Opera browser on your computer[3].

In this example we are going to use Internet Explorer as the browser and Google as a search engine. When you open Internet Explorer, the browser's home page will appear (figure 3.43).

2 https://www.gcflearnfree.org/internetbasics/what-is-the-internet/1/ [Accessed 20 July 2017

3 https://www.techwalla.com/articles/examples-of-web-browsers [Accessed 20 July 2017]

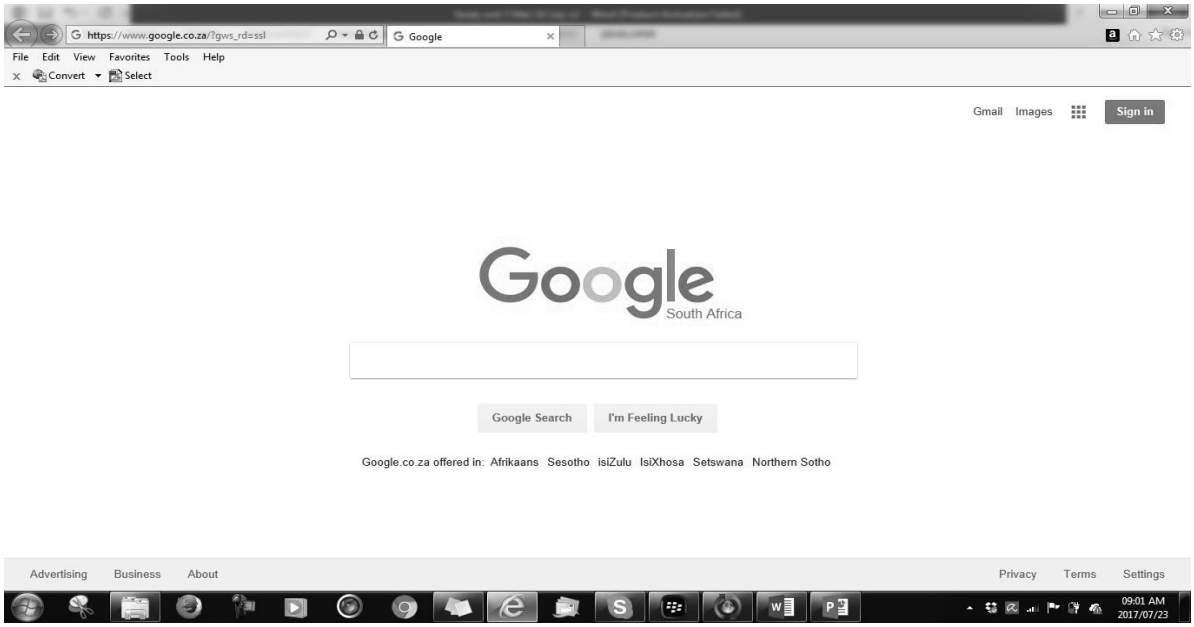
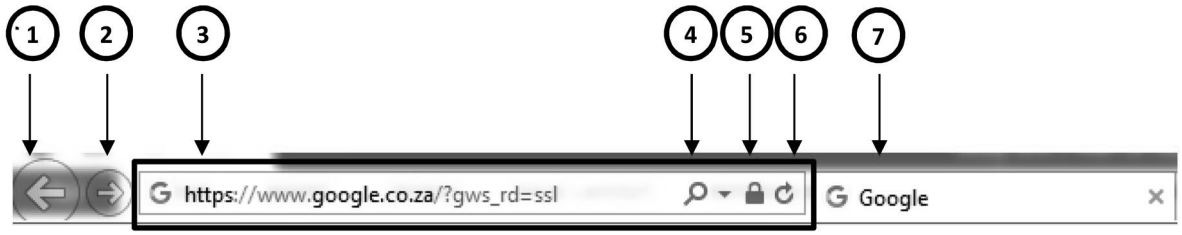


Figure 3.43: Internet Explorer home page

At the top of the screen you will see the back and forward arrows and the address bar (indication of the location of the website). This is shown in figure 3.44.



1) **Back arrow**
2) **Forward arrow**
3) **Address bar**
4) **Search button**
5) **Security report**
6) **Refresh**
7) **Name of the web site**

Figure 3.44: Window organisation

The address bar consists of a protocol, domain name, path and a web page name. The protocol is the communication protocol and is usually http or https (hypertext transfer protocol). The domain name is the name of the server where the website is located. The path and web page name are optional information and indicate the location of a specific web page on a website. In figure 3.45 below is an example of the components of an address or URL (uniform resource locator).



Figure 3.45: Address bar or box

Example:

https:// – protocol
www.unisa.ac.za/ – domain name
Sites/corporate/default – path

A search engine is used to search for information. Search tools like search engines enable you to locate information that was stored on various websites. Examples of search engines are Google, Bing, and Yahoo[4]. To search for information, you can use a keyword, a phrase or even an image. For example, if you want to use the Google search engine, you need to type the address of the Google website (www.google.co.za) in the address bar of the internet browser as shown in figure 3.46. To search for information about the weather, you need to enter the keyword as indicated in figure 3.37 below:

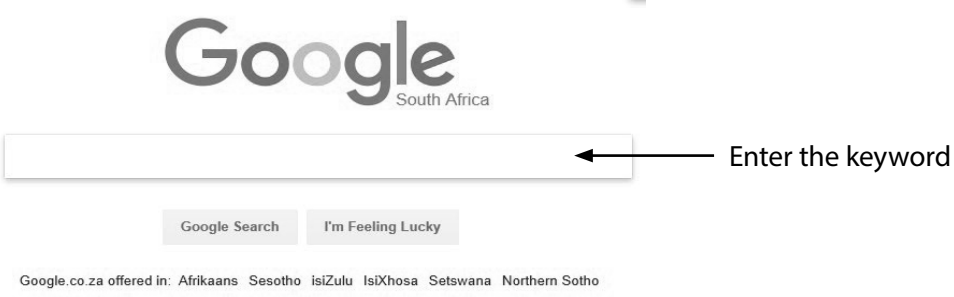


Figure 3.46: Google

When you start typing the keyword, Google will predict or suggest phrases based on previous searches or your location (see figure 3.47). You can either search the keyword you entered or select one of the phrases suggested by Google.

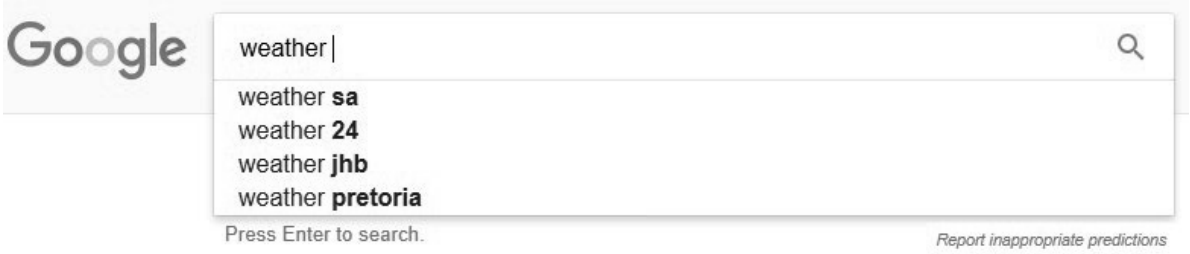


Figure 3.47: Google searches

You can also use special operators to refine your search (Gunter & Gunter, 2015). For example:

Weather AND KZN	Both Weather and KZN need to appear on page
Weather OR KZN	Either Weather or KZN appear on page
Weather AND NOT KZN	Pages about weather, but excluding pages about KZN
"Weather KZN"	The exact phrase "Weather KZN" needs to appear
Weather South*	Weather in any South country or region will be included

4 http://www.ecloudbuzz.com/top-10-best-search-engines-in-the-world/ [Accessed 20 July 2017]

Take note, when you, for example, enter a keyword in a search engine, it does not search the entire internet for the specific word, but the databases of internet sites and documents (Gunter & Gunter, 2015). After you have searched and located information, you can download it to be used.

3.6.3 Upload and download information

In order to see the differences between the upload and download of information, watch the YouTube video by selecting the link https://www.youtube.com/watch?v=FE9zl1K6Jjw (1.39 min) or scan the QR code shown in figure 3.48.

Figure 3.48: Differences between download and upload

In short, when you upload information, you send it from your computer to the internet (send an email) and when you download information, you retrieve it from the internet and save it on your computer / device (movie).



Discussion forum

Use any search engine to search for educational websites. Open the website, and determine how you can use the information on the website in your educational environment. Then post the name of the website; the link to the website, in the discussion forum; and briefly describe how you can use the information from this website in your environment.



Activities

For all of these activities, you will need to search for information on the WWW and test the information and determine how you can use it in your educational environment.

Activity 1

It can be a cumbersome process to search for information on the WWW. When you enter a keyword, it displays a list of millions and millions of links to web pages or documents where the specific keyword can be found. Therefore, it is important to refine your search. In addition, when searching for content, you also need to take copyright issues into consideration. While talking to other teachers, you hear them mention that the learners need to be actively involved and engaged while you are teaching. You are not sure what is meant by actively involved and engaged; and you do not know how to accomplish it. You decide to use Google to see what has already been written about it.

(1) Open your browser and search scholarly articles about how to engage students when teaching.
(2) You are so intrigued by what you have read that you want more information. Search educational blogs to find out what technology you can use to make sure that your students are actively involved.

Activity 2

You have observed that the majority of your learners have either access to a tablet or a smartphone. To make sure that the learners are actively involved during a lesson, you

have decided to ask questions and then let the students use their tablet/smartphone to answer the questions. In this way you make sure that even the shy learners participate.

(1) Use your internet browser to do a search, using words such as: polling on cell phone, audio response systems on cell phones and so forth.
(2) From the list of options, choose one and test it in your class. Write a short paragraph on your experience, whether it worked or not.
(3) After testing this audio response system, you realised that in some schools, the use of cell phones might be problematic. Do another search to look for a tool that allows teachers to collect real-time formative assessment data without the need for a student to have an electronic device.
(4) From the list of options, choose one and test it in your class. Write a short paragraph on your experience, whether it worked or not.

Activity 3

Computer ethics is a real concern worldwide. Many educators feel obliged to teach their learners what is right and what is wrong. Many ethical issues are discussed in this article published on "education world" website (http://www.educationworld.com/a_tech/tech/tech055.shtml). You can use the article or search for more information about ethical issues. After reading the material, make a list of at least five ways in which you can teach your learners about the ethical use of technology.



Additional discovery

Greenhow, C., Robelia, B., and Hughes, J.E. 2009. Learning, Teaching and Scholarship in a Digital Age. Web 2.0 and Classroom Research: What Path Should we take now. Educational Researcher, 38 (4): 246–259.

3.7 PERSONAL REFLECTION

In this learning unit, we focused on using MS Word, MS Excel, MS PowerPoint, MS Access, the internet and World Wide Web. Please take some time to reflect on each section.

- What did you learn while working through:
  - MS Word
  - MS Excel
  - MS PowerPoint
  - MS Access
  - Internet and World Wide Web?
- What are you going to implement or try out in your practice? Please write down examples.
- What questions do you still have after working through the sections and how are you going to find help/assistance in this regard?
- What did not work for you and why?

3.8 CONCLUSION

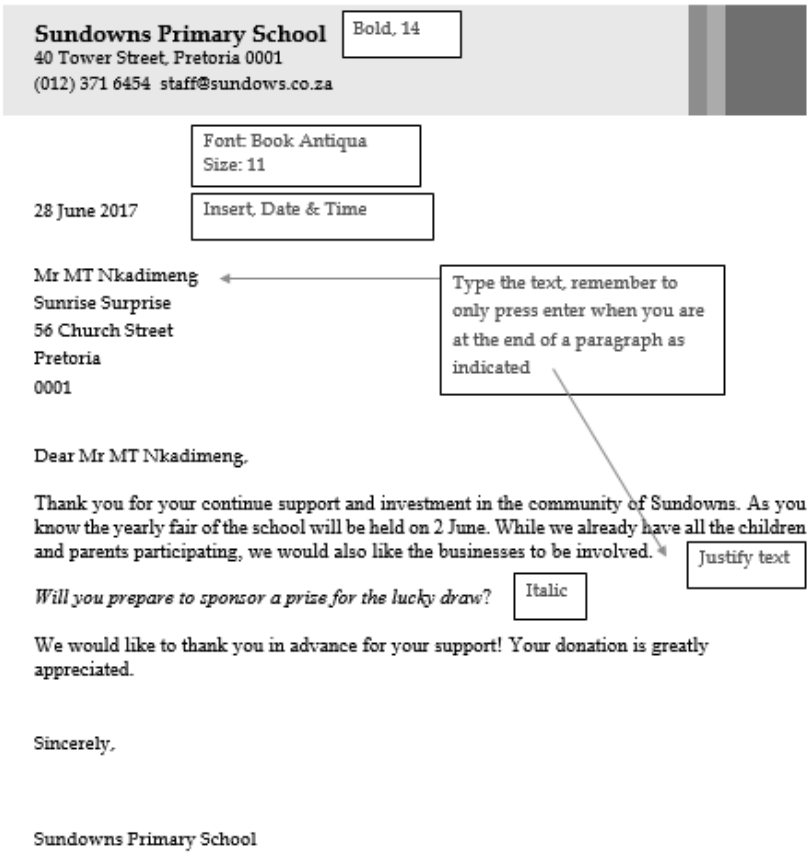
In this learning unit, we focused on how you, as a teacher, can evaluate and update your ICT skills. We gave you examples; links to YouTube; videos and activities to encourage you to use the computer as part of your classroom activities. In the first section the focus was on working with MS Word to compile assignments and reports. Examples were given and your knowledge was challenged with the activities. Furthermore, the use of MS Excel for compiling spreadsheets and doing calculations were looked into, especially class lists and mark sheets.

When creating a presentation, the needs of each audience are different, but there are universal rules to apply to keep the attention of your audience. In this section, we also gave you examples of what not to do. In addition, examples are also given to use MS PowerPoint to build interactive presentations. While the basic functions of MS Access can be used to record the biographical information of the learners and printing reports.

Lastly, the internet and the difference between the internet and World Wide Web were discussed. In addition the internet searches for information were explained and examples were given.

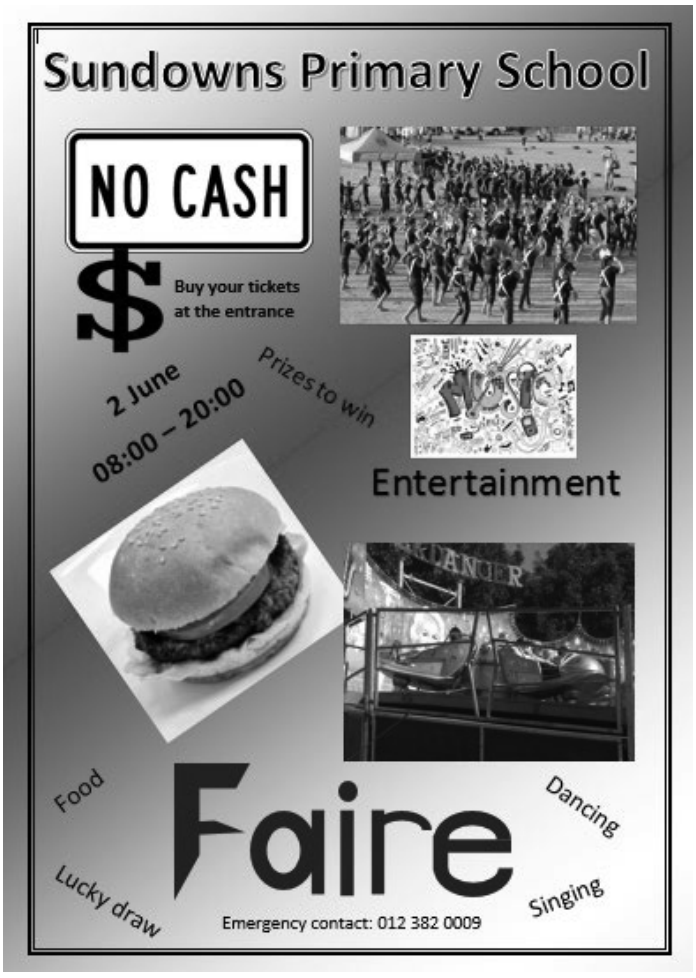
3.9 APPENDICES

Word-processing Scenario examples:



BUCKS R2 Sundowns Primary	BUCKS R5 Sundowns Primary	BUCKS R10 Sundowns Primary	BUCKS R20 Sundowns Primary
BUCKS R2 Sundowns Primary	BUCKS R5 Sundowns Primary	BUCKS R10 Sundowns Primary	BUCKS R20 Sundowns Primary
BUCKS R2 Sundowns Primary	BUCKS R5 Sundowns Primary	BUCKS R10 Sundowns Primary	BUCKS R20 Sundowns Primary
BUCKS R2 Sundowns Primary	BUCKS R5 Sundowns Primary	BUCKS R10 Sundowns Primary	BUCKS R20 Sundowns Primary
BUCKS R2 Sundowns Primary	BUCKS R5 Sundowns Primary	BUCKS R10 Sundowns Primary	BUCKS R20 Sundowns Primary
BUCKS R2 Sundowns Primary	BUCKS R5 Sundowns Primary	BUCKS R10 Sundowns Primary	BUCKS R20 Sundowns Primary
BUCKS R2 Sundowns Primary	BUCKS R5 Sundowns Primary	BUCKS R10 Sundowns Primary	BUCKS R20 Sundowns Primary
BUCKS R2 Sundowns Primary	BUCKS R5 Sundowns Primary	BUCKS R10 Sundowns Primary	BUCKS R20 Sundowns Primary

- ✓ Insert a table (8 rows, 4 columns).
- ✓ Enter the text in the first row.
- ✓ Use a WordArt for the currency amount.
- ✓ Copy the text to the rest of the table.
- ✓ Change the fill colour of each column.



- ✓ A4 paper
- ✓ All margins 1 cm
- ✓ Insert a background to the page
- ✓ Insert a border for the page
- ✓ Insert the text (Word Art / Text box)
- ✓ Remove the fill / outline of text box
- ✓ Rotate text box
- ✓ Insert pictures
- ✓ Rotate pictures
- ✓ Change the wrapping of pictures
- ✓ Change the order of pictures
- ✓ Use shapes to build the word Faire (then group them)

Faire

Spreadsheet scenario example:

Income / Expenditature Statement

Sundowns Primary School

Income			
	Unit Price	Quantity	Total
Ticket sales			
Pre-school kids	5	300	1500
Other kids	10	250	2500
Adults	30	750	22500
Flea market stalls	150	25	3750
Food stalls			500000
Wrist bands	60	1000	60000
Roman Pizza sales	100000	15%	15000
Total Income			**R 605,250.00**
Expenses			
Merry go round hire			30000
Entertainment costs			25000
Other material			75000
Electrical equipment			35000
Food ingredients			35000
Total Expenses			**R 200,000.00**
Profit			**R 405,250.00**

3.10 MORE IDEAS / WEBSITES TO VISIT

Videos	**Link**
MS PowerPoint	
Flash cards / memory board game (12:49 min)	https://www.youtube.com/watch?v=k4Or-Cd3Kyg

MS Access	**Link**
Library databases for research	https://www.youtube.com/watch?v=Q2GMtIuaNzU (2:34)
Design and build tables for a database	https://support.office.com/en-us/article/Design-and-build-tables-for-a-database-Access-basics-part-1-bff6e7b2-3055-419b-8751-1ade558ea31f?ui=en-US&rs=en-US&ad=US (4:35)
How to use Access help	https://www.youtube.com/watch?v=wTsXRv48Ndo (6:28)
Customize Access options and settings	https://www.youtube.com/watch?v=H_tNTOv-bNU (12:11)
Access ribbons and toolbars	https://www.youtube.com/watch?v=YJHVuoxcdvI (12:10)
Customizing the quick access toolbar	https://www.youtube.com/watch?v=m5oDxl9TVTU (5:27)

Access 2013 tutorial (12 videos by PC Learning Zone)	https://www.youtube.com/watch?annotation_id=annotation_1603261247&feature=iv&index=2&list=PLhKFRV3-UgpeA_3wzRHF8AS8T7ppKvm9O&src_vid=ySyMn3H4rvg&v=jM_O-JopORM
Access 2013 tutorial (9 videos by Simon Sez IT)	https://www.youtube.com/watch?v=K6BN4PSBRZA&list=PLzj7TwUeMQ3hFA4R_5Z1Fc2HZX8C2O1YV

Websites	
Educational technology and mobile learning	http://www.educatorstechnology.com/
Teaching with technology: using MS Excel in the classroom	https://www.investintech.com/content/excelclassroom/
Education world	http://www.educationworld.com/

Learning Unit 4

Teachers' ICT competency literacy skills

4.1 INTRODUCTION



Figure 4.1: Computer desktop (https://pixabay.com/en/photos/computer/)

The development of computer technology and advancement in mobile technology play a huge role in how each one of us work, live, play and learn. Nowadays, we are being confronted with devices that have computer-like capabilities that were not available a few years ago. In other words, computers form part of our daily lives. When you hear the word computer, the following picture (figure 4.1) comes to mind, but this idea of a computer is changing as more devices are build that have computing powers. Take, for example, washing machines, coffee and cappuccino makers, Xbox gaming devices, cell phones, motor car engines that have computers controlling the device. Therefore, computers are all around us and they are changing our lives (Gunter & Gunter, 2015).

Although technology is part of our lives, the absence of it is visible in education many times. However, an increase in the use of technology, especially in Africa, is observed (figure 4.2).



Figure 4.2: Technology use in the classroom (http://www.cavie.org/en/images/29_03_2017/Online_education_is_the_future_for_Africa.jpg)

Therefore, it is important to also think of ways how you (as a teacher) can use ICTs in the classroom and how students can use ICTs to assist them in their learning adventure. In the next section, the focus will be on what a computer is; how to find information; and how

to combine the use of computers (and technology) with teaching and learning to enhance the student learning experience. This section will be followed by a discussion focusing on how to decide which software to download and use; finally the required security risks you need to be aware of when working with computers, technology and networks.



Learning outcomes

At the end of this learning unit you will be able to:

- Name and discuss the three literacies: computers, information and integration.
- Evaluate software programs and website for use in teaching and learning.
- Identify and discuss computer security risks, safeguards in the use of ICT and computer ethics for teachers.

4.2 COMPUTER, INFORMATION AND INTEGRATION LITERACIES

In figure 4.3, the relationship between computer literacy, information literacy and integration literacy is illustrated. For more information about the various literacies, you can read Chapter 1 in the book *Teachers discovering computers*. (8th edition) by Gunter and Gunter (2015: p3–4).

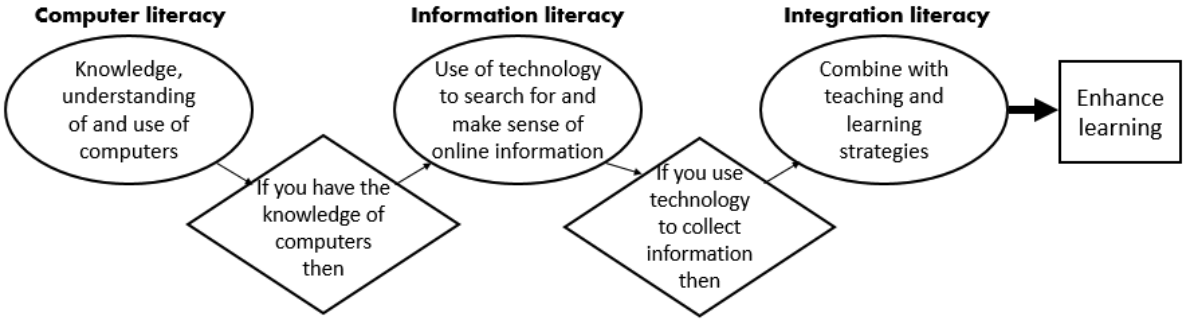


Figure 4.3: Computer, information and integration literacy

4.2.1 Computer literacy

As mentioned before, you already know that computers are all around us. Therefore, it is important to know what a computer is. In today's world, a computer comes in many shapes and sizes. Watch the following YouTube video (2.39 min) to know more about a computer, by selecting the following link:

https://www.youtube.com/watch?v=7cXEOWAStq4 (2:39 min) or scan the QR code shown in figure 4.4.

Figure 4.4: What is a computer?

Now that you know what a computer is, let us find out more about the basic parts of a computer. It is also important to have some background

knowledge about what is going on inside a computer as well as how we connect the various parts of a computer. Watch the YouTube video clips by selecting the following links, or scanning the QR codes as shown in figure 4.5, 4.6 and 4.7.

Parts of a computer (2:08 min) (figure 4.5)

https://www.youtube.com/watch?v=K00dKueUDuI



Figure 4.5: Parts of a computer

Inside the computer (2:19 min) (figure 4.6) https://www.youtube.com/watch?v=4eNTlwnnhss&list=PL5OG8acV0zdZhusM2ijL1juZWcjQss-hC&index=6



Figure 4.6 inside a computer

Buttons and ports of the desktop computer (3:07 min) (figure 4.7)

https://www.youtube.com/watch?v=94lT9Ywuhd4



Figure 4.7: Buttons and ports of a desktop

Not only do computers come in different shapes and sizes, but they are also categorised based on their size and performance. In order to know more about different types of computers, watch the YouTube video (2:08 min) by selecting the link

https://www.youtube.com/watch?v=ceqBD3TCheg&t=2s or scan the QR code shown in figure 4.8.



Figure 4.8. Types of computers



Concept testing

To show that you know the following concepts, create a table to give examples of each concept and who will most likely use it:

Concept	Examples/Use	Who will use it?
Computer hardware		
Computer software		
Supercomputers		
Mainframes		
Minicomputers		
Micro/Personal computer		
5 other types of computers		

4.2.2 Information literacy

Information literacy refers to the ability to **search** for information on the World Wide Web. After searching for the information, you need to determine whether or not the information is relevant to your needs. Thereafter, you need to take all the information that you have found and then organise it in such a way that it answers the question that you have; or provide the information that you are looking for (Gunter & Gunter, 2015).


Figure 4.9: What is information literacy?

To learn more about information literacy, watch the two YouTube video clips by selecting the following links: https://www.lynda.com/Higher-Education-tutorials/What-information-literacy/368046/420105-4.html (1:47 min)

or https://www.youtube.com/watch?v=559wIQMJAtQ (3:20 min) or click on the QR code shown in figure 4.9 and Figure 4.10.


Figure 4.10: Information literacy in the digital age

Information is freely available. Any person can create a website or blog and put all kinds of information on it. Therefore, information literacy is very important. Also, watch the YouTube video clip (5:24 min) to see why information literacy is important. You can select the link https://www.youtube.com/watch?v=ciSWknQ98o8 (5:24 min) or click on the QR code shown in figure 4.11.


Figure 4.11: Information literacy why is it important

In the video clips above, the importance of information literacy is stressed. Moreover, one of the definitions of information literacy is to find, evaluate and use information. How to search for information was discussed in learning unit 3. The question 'How do you evaluate information found on the internet?' now arises. You need to be able to discern between information that is relevant and irrelevant. These skills also need to be taught to students.


Figure 4.12: Evaluating websites

To learn more about how to determine whether information found is from a reliable source, watch the YouTube video clip (1:56 min) by selecting the link https://www.youtube.com/watch?v=aem3JahbXfk or click on the QR code shown in figure 4.12.

The third part of the definition of information literacy is to use the information you have found. Care must be taken that you acknowledge those people to whom the information belongs (citations); if you not acknowledge them, you will be guilty of plagiarism.


Figure 4.13: Why we cite sources

To find out more about citations and plagiarism, watch the YouTube video clips by selecting the links or click on the QR code shown in figure 4.13 and 4.14.

https://www.youtube.com/watch?v=pG7M4xxrmbo (3:22 min)

https://www.youtube.com/watch?v=CDGdqoCyAtw (3:14 min)


Figure 4.14: Citation for beginners



Concept testing

To verify the information you have found on the video clips, talk to your local librarian (town or school) and ask the following questions. Summarise the information in a short paragraph.

(1) If I do not have access to the internet, what other resources can I use?
(2) What is plagiarism?
(3) What is the consequences if I plagiarise someone else's work?
(4) How do I use information from resources without plagiarising their work?

4.2.3 Integration literacy

Taking the knowledge you have of computers and technology into consideration as well as your knowledge of how to search for information, integration literacy refers to how you integrate this knowledge with teaching and learning strategies. Integration literacy is only possible if teachers understand what a computer is; how to use the computer to access information; and how to make sense of it and then match the appropriate technology to the learning outcomes (Gunter & Gunter, 2015).

In order to inspire your students, watch the YouTube video on "Teaching methods for inspiring the students of the future" (Ruhl, 2015). Watch out for the 5 Cs for inspiring students. Watch the YouTube video by selecting the following link:

https://www.youtube.com/watch?v=UCFg9bcW7Bk (17:41 min) or scan the QR code shown in figure 4.15.

Figure 4.15: Teaching methods for inspiring students of the future

What would a possible future classroom look like? To find out, watch the YouTube video by selecting the following link:

https://www.youtube.com/watch?v=uZ73ZsBkcus&t=38s (2:42 min) or scan the QR code shown in figure 4.16.

Figure 4.16: Future classroom

You may ask the question: 'Can Technology Change Education?' Ray Dhingra (2012) build a powerful argument why he say yes! To watch the YouTube video select the following link:

https://www.youtube.com/watch?v=l0s_M6xKxNc (16:43 min) or scan the QR code shown in figure 4.17.

Figure 4.17: Can Technology change education

One of the definitions of blended learning is using technology in combination with classroom teaching (Traxler, 2010; Bailey, Ellis, Schneider & van der Ark, 2013; Aleksić & Ivanović 2013). Giarla (2018) wrote a blog post about the "Benefits of blended learning" on the TeachThought website. Search for her post, to learn more about blended learning. For more information on blended learning, watch the YouTuve video by selecting the link https://www.youtube.com/watch?v=2Keyp-I8ATA (1:13) or scan the QR code shown in figure 4.18.

Figure 4:18: What's Up with blended learning?

As an increasing number of people have mobile phones, these phones become more popular, especially in education. To know more about mobile learning and how it can be used in the classroom and benefits of mobile learning, watch the following YouTube videos by selecting the links or scanning the QR codes shown in figure 4.19 (3:00 min), Figure 4.20 (1:50 min) and figure 4.21.

Figure 4.19: What is mobile learning?

What is mobile learning?

https://www.youtube.com/watch?v=4rrpySEpuKQ (3:00 min)

Figure 4.20: Mobile learning in the classroom

Mobile learning in the classroom:

https://www.youtube.com/watch?v=NCQsnt3rDvk (1:50 min)

Figure 4.21: Benefits of mobile learning

Benefits of mobile learning:

https://www.youtube.com/watch?v=X6mdB5zSyqs (13:27 min)



Concept testing

To distinguish between blended learning and mobile learning, search for an article on the advantages, uses and successes of each. Giarla (2018) wrote an blog post about the "Benefits of blended learning" on the TeachThought website. Search for her post and then make a list of the advantages of blended learning. Add to your list by searching for similar articles. In a similar manner, Jenkins (2016) mentioned six mobile learning benefits. Search for her article and make a list of the advantages of mobile learning. Add to your list by searching similar articles. After reading the blog posts and articles, complete the following table:

Concept	Advantages	Where will it best fit?
Blended learning		
Mobile learning		

Summarise what you recorded in the table and share it with your fellow students in the discussion forum.



Discussion forum

(1) In the discussion forum, type as many words you can find where the meaning of the word has changed after computers became common. For example, cloud (something in the sky versus virtual storage space); tablet (medication versus mobile device).

(2) In the discussion forum, give examples of where you can go to connect to the internet if you do not have internet access on your computer, tablet or mobile phone.

(3) In the discussion forum, give examples of educational websites that you have searched for; and can use. This may include websites about lesson plans, teaching techniques, teaching technology and many more.
(4) Come up with a collective definition of computer literacy, information literacy and integration literacy.



Activity

(1) In section 4.1 and 4.2.1, various links are given to video clips. After you have watched these video clips, write a paragraph about your definition of the use of computers in education and include the purpose of computers in a school setup. Remember that a computer can be a fixed device or a mobile device. To articulate your definition, use the following as a guide:

A computer in education is … This device consist of various components/parts such as … Because a computer can do ….... teachers can used it for … in a school setup.

(2) From the information in the video clips in section 4.2.1 (and Chapter 1 in the book Teachers discovering computers (8th edition) by Gunter and Gunter (2015)), identify the different parts of a computer. For example: CPU, monitor, keyboard, etc.

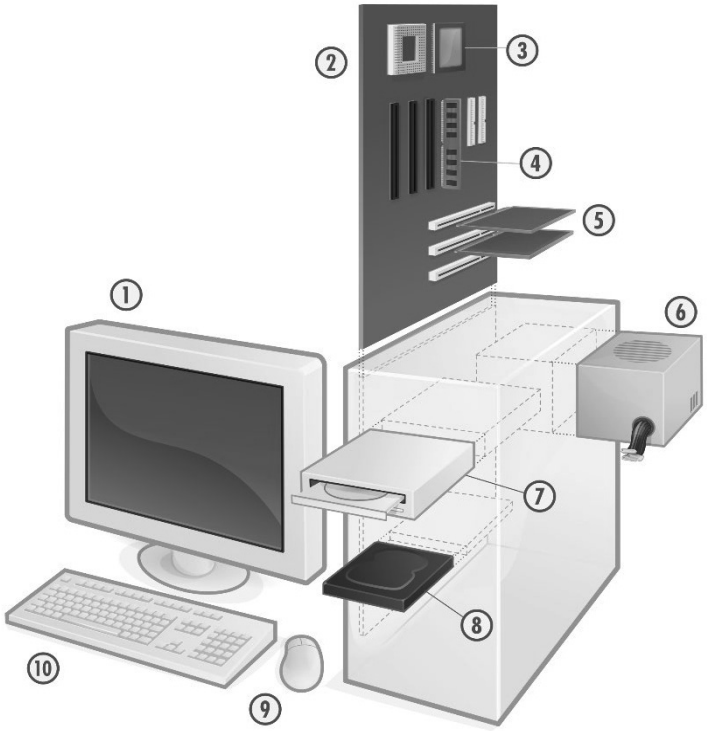


Figure 4.22: Personal computer (https://commons.wikimedia.org/wiki/File:Personal_computer,_exploded_2.svg)

- Identify the various components of the desktop computer in figure 4.22.
- Make a list of all the components.
- Take your list to any store that sells computer parts and ask them if you have all the parts necessary to build a computer.
- Adapt your list, if necessary; and find out what the individual prices for each one of these components are.

- Compare what option will be the most cost-effective, buying a computer that is already assembled or building your own computer.

(3) From the information in the video clips in section 4.2.1, identify the different ports of a computer. For example, USB or VGA ports

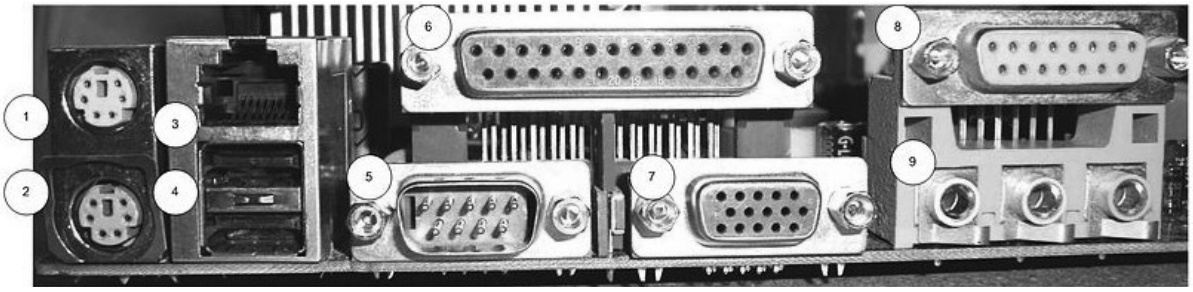


Figure 4.23: Computer ports (https://commons.wikimedia.org/wiki/File:Motherboard_external_connections.jpg)

- Identify the various ports of the desktop computer in figure 4.23.
- Give an example of what kind of device will be connected to the computer through such a port.

(4) From the information found on the video clips in section 4.2.2, identify all the steps involved in information literacy. Draw a diagram to indicate the relationship between these steps.

(5) To make sure the information that you have found on the internet is true and reliable, you need to evaluate the website on which you have found the information. Below is a list of three websites that you can visit to verify the information. Look at the common factors the websites refer to and make a list of things to look out for if you want to determine whether the content you have found on a website is reliable and credible. Find more websites on the same topic and test whether or not the list you have made is confirmed by other authors.

Examples:

- http://www.library.georgetown.edu/tutorials/research-guides/evaluating-internet-content
- http://www.ed.ac.uk/information-services/library-museum-gallery/finding-resources/library-databases/databases-overview/evaluating-websites

(6) In this video about "Practical ways to integrate technology in the classroom", the author mentioned five challenges they face when they want to use technology. Think about these five challenges; and come up with ideas or ways on how you can minimise the effect of these challenges.

https://www.youtube.com/watch?v=AgLNRKQR3AI (5:19 min)



Scenario

A few years ago, Katy Independent School District launched a program designed to fundamentally transform instruction. They implemented a BYOD strategy. The students use their own devices to access the internet and search for information. With the use of technology, they transform the teaching and learning in their district. The full story can be watched on YouTube (https://www.youtube.com/watch?v=JCB_Q3gZOf4) (4:22 min) or scan the QR code:

You have gained knowledge about computer literacy (knowledge and understanding of the use of computers); information literacy (use of technology to search and make sense of information) and integration literacy (combine your knowledge about computers and information with teaching and learning strategies). Apply this knowledge when answering the following questions:

(1) Why did this school decided to use a BYOD strategy?
(2) Make a list of all the technology they need to have in place in order to implement their BYOD strategy.
(3) To prevent all the students from having access to the school networks, how did they manage to provide students with internet access?
(4) How did the students use these devices in the class?
(5) How did they attend to the issue of some students not having devices to use?
(6) How did the BYOD strategy change the role of the teachers and students?

Think back at your high school. Based on the questions above, explain how your school can implement a similar strategy.



Additional discovery

Follow the discussion by Mike Sharples and Simon Tindall (2016) on the "Trends in learning" (https://www.youtube.com/watch?v=ONZyUseKNUU). From what you have learned, you will begin to understand and apply the following types of learning or learning strategies:

- Incidental learning https://www.youtube.com/watch?v=YX5Oz24P02w (2:16 min)
- Adaptive teaching https://www.youtube.com/watch?v=-aYi07tDaJw (3:01 min)
- Learning analytics https://www.youtube.com/watch?v=vjo9vL607Cw (5:51 min)
- E-books https://www.youtube.com/watch?v=uq7sDjDsb8Q (5:28 min)
- Mobile learning https://www.youtube.com/watch?v=MvN2YuDjzCA (5:08 min)

Which of the above types of learning or learning strategies appeal to your style of teaching and why?

4.3 SOFTWARE PROGRAMS AND WEBSITE SOURCES

In section 4.2, you learned about computer literacy, information literacy and integration literacy. As mentioned in the book *Teachers discovering computers* (Gunter & Gunter, 2015), computer literacy refers to your knowledge of computers and how they work; information literacy refers to how to search for information and how to discern whether the information is true or not. Integration literacy refers to how you can use the above to

enhance learning. In this section, you are going to search for applications and websites and evaluate if you can use it for teaching and learning.

Application software can be used in various ways:

- Firstly, you can use it to assist you in administering your classroom. For example, MS Excel to keep a class register or enter your marks. You can also use a learning management system to create a virtual class where you can communicate with your students; assess them and enter their marks.
- Secondly, you can use application software to facilitate or enhance learning. For example, you can use a learning management system to provide students with additional information and give them formative assessments.
- Lastly, students can use application software to enhance their own learning. For example, students can enter the average length of Grade 1, Grade 2 and Grade 3 learners. Use MS Excel to create a chart and predict the average length of Grade 4 learners.

Watch the following YouTube video clip by selecting the link https://www.youtube.com/watch?v=zQPfB9oBUgM (0:48) or scan the QR code shown in figure 4.24. In this video clip, you need to be on the lookout for characteristics of system software and application software. Take note of the functions of system and application software.

Figure 4.24: System software and application software

Operating systems are system software that contains instructions that coordinate all the hardware of a computer and allow you to install and use application software (Gunter & Gunter, 2015: p100). The operating system also provides the interface between the computer and the user; starts the computer (boot); includes device drivers that allow devices like a printer, mouse and monitor to work and manage network connections and files (Morley & Parker, 2017). To learn more about operating systems and examples of operating systems, watch the following video clip by selecting the link https://www.youtube.com/watch?v=5AjReRMoG3Y (3:36 min) or scanning the QR codes shown in figure 4.25.

Figure 4.25: Operating system Introduction

Application software is software designed to perform a specific task (Gunter & Gunter, 2015). Popular examples of application software are word processing, spreadsheets, database and presentation graphics (Morley & Parker, 2017). You will remember that we discussed some of these applications software in Learning unit 3. In order to understand applications, watch the following video clip by selecting the link https://youtu.be/MYgy4rjV4J0 or scanning the QR codes shown in figure 4.26.

Figure 4.26: Understanding applications



Concept testing

To show that you know the following concepts, create a table and provide the meaning and purpose of each as well as an example.

Software	**Use**	**Example**
System software		
Application software		
Example	**Use**	
Windows		
MS Excel		
Google maps		
Skype		
Moodle		
Google docs		
Pokemon Go		
Instagram		
Lynux		
MS Outlook		

Many researchers such as Shipman (2014); Walters, Kenna and Bruce (2016) had written articles about the use of applications or applications in the classroom. Furthermore, on commercial websites such as Apple, Google and Microsoft, examples are given of educational apps from each one of those platforms that teachers can use in their classrooms.

Access the following websites for more information:

- Google of education: https://edu.google.com/products/productivity-tools/
- Applications for Windows: https://www.microsoft.com/en-us/education/products/education-apps/default.aspx

Further tips to use technology in your classroom can be found on the following websites:

- 12 Easy ways to use technology in your classroom: http://www.teachhub.com/12-easy-ways-use-technology-your-classroom-even-technophobic-teachers
- Learning applications: https://elearningindustry.com/7-ways-popular-apps-in-the-classroom
- Kinds of software to use: http://integratetech.net/book/export/html/9
- LMS (Top 20 LMS software 2017): http://www.capterra.com/learning-management-system-software/
- Applications for education: https://www.educationalappstore.com/app-lists/apps-for-education
- Apps for teachers http://www.wxyz.com/news/best-teacher-approved-apps-for-back-to-school-learning https://www.youtube.com/watch?v=rnU-Zcm7wlw

- Applications for students
  https://www.youtube.com/watch?v=XWJpfIT7A28
  https://www.youtube.com/watch?v=n506ilO16NQ
  https://www.youtube.com/watch?v=1ch2N8JgVWI



Discussion forum

(1) Search for as many applications teachers can use to manage their classrooms and do administrative tasks. Read the reviews on these applications; select three with the best reviews; install them and try them out. In the discussion forum, post three applications you have tried out and indicate whether or not they worked for you.
(2) Search for as many applications teachers can use to facilitate teaching and learning. Read the reviews on these applications; select the three with the best reviews; install them and try them out. On the discussion forum, post three applications you have tried out and indicate whether or not they worked for you.
(3) Search for as many applications students can use to enhance learning. Read the reviews on these applications; select the three with the best reviews; install them and try them out. In the discussion forum, post three applications you have tried out and indicate whether or not they work for you.

4.4 COMPUTER SECURITY RISKS, SAFEGUARDS AND COMPUTER ETHICS

According to Gunter and Gunter (2015), any action that causes loss of equipment, data or processing capability is a computer security risk. Therefore, teachers need to safeguard their hardware and software on their computers. In addition, they also need to use computers in such a way that they do no harm; therefore, we also need to look at moral guidelines when working with computers (Gunter & Gunter, 2015).

4.4.1 Computer security risks

Gunter and Gunter (2015), claim that any action that can cause harm to your computer is called a security risk. These actions can be in the form of loss of computer equipment, software, data or processing capability. These security risks can be caused by computer viruses, sabotage, online fraud, hardware and information theft and unauthorised access and use (Morley & Parker, 2017). These security risks, according to Morley and Parker (2017) fall in the category of computer crime. Therefore, computer users need to put measures in place to safeguard their computers so that they are not at risk. Below is a website you can visit to know more about security threats and risks. In addition, to know more about IT securities, watch the YouTube video clip by selecting the link or scanning the QR code shown in figure 4.27.

Cyber security risks: https://www.getcybersafe.gc.ca/cnt/rsks/index-en.aspx

IT securities https://www.youtube.com/watch?v=pfnFqOItSIg (4:55 min).

Figure 4.27: IT securities



Concept testing

To show that you know the following concepts, create a table and give a short description of what the security risk does:

Concept	Explanation
Virus and Malware	
Ransomware	
Phishing	
Junk email	

4.4.2 Safeguards in the use of ICT

Computing devices are used in our everyday life. Therefore, you need to take precautions so that you do not loose information, fall prey to cybercrime or endanger other people.

4.4.3 Computer ethics for teachers

Because of the increased use of computers and the internet, it is inevitable that teachers will also use computers to search for information. In this case, they will encounter ethical issues on a daily basis (Morley & Parker, 2017). In the same manner that we are bound by moral and ethical rules in our daily lives, we are also bound by ethical rules in relation to computer and social media use. More specifically, a teacher will be confronted by ethical decisions on a daily basis (Morley & Parker, 2017).

Computer ethics are the guidelines according to which users use computers and information systems (Gunter & Gunter, 2015). To see the list of computer ethics for educators, watch the YouTube video clip by selecting the link or scanning the QR code shown in figure 4.28. While watching, pay close attention to how to prevent students from accessing unsuitable information, protect personal information and respect the privacy of others.

10 Commandments of computer ethics https://www.youtube.com/watch?v=HwSHJg7cSXM (3:39)

Figure 4.28: 10 Commandments of computer ethics



Discussion forum

Start an electronic Mexican wave in the discussion forum. Enter as many computer crimes you can find. Make sure that you do not repeat any.



Activity

(1) From the information above (4.4.1 and 4.4.2), make a list of at least seven security risks. Determine a way to safeguard your computer against each one of these risks. Also, indicate the consequences if you do not take care of it. For example:

Security Risk	**Safeguard**	**Consequence**
Computer virus	Install and run an anti-virus program	Valuable data will be lost



Scenario

In section 4.4.2, you were warned about the dangers of cybercrime and reminded to safeguard yourself against a possible cyber attack. With that information in mind, access the article link mentioned below. This link is to a news article called "As one of the world's most active cybercrime countries, SA must protect itself against increasing virtual threats", that appeared online in 2014. In this article, the vulnerabilities of internet users are exposed. Read the article and answer the following questions:

https://issafrica.org/iss-today/south-africa-must-pay-more-attention-to-cybercrime

(1) City of Tshwane provides free internet to almost every household. What are the implications if all people have access to the internet?
(2) It is a fact that students in Tshwane will have access to the internet. What measures do schools and parents need to take to prevent students from accessing inappropriate information; protect them from cyber bullying and other related sex crimes?
(3) One of the security risks they mentioned in the article is Malware. Answer the following questions that relates to malware:

- What is computer Malware?
- Explain how your computer is infected by Malware.
- What harm does Malware do to your computer?
- How you can remove Malware from your computer?

(4) Write down at least five steps that the government need to take to change the cyber security issue in South Africa.

4.5 PERSONAL REFLECTION

In this learning unit, we firstly discussed the three literacies, namely computer literacy, information literacy and integration literacy. Secondly, we evaluated software and websites; and lastly, an explanation was provided of computer security and precautions. Please take some time and reflect on each section.

- What did you learn while working through the content about:
  - Computer literacy, Information literacy and Integration literacy
  - Software programs and website sources

  - Computer security risks and safeguards
  - Internet and World Wide Web?

- What are you going to implement or try out in your practice? Please write down examples.
- What questions do you still have after working through the sections and how are you going to find help/assistance in this regard?
- What did not work for you and why?

4.6 CONCLUSION

In this learning unit, the focus was on how you can acquire competent literacy skills. To do so, links to books, websites and YouTube videos were provided to expose you to information relating to the topics discussed.

Three kinds of literacies namely computer literacy, information literacy and integration literacy were mentioned. The relationship between the three kinds of literacies was also shown. In order to be computer literate, you need to have basic knowledge about computers; how they work; components inside a computer; the types of computers; and what they are used for. To be information literate, you need to be able to search for information; but, more importantly, you need to discern what information is reliable or not. How do you apply your computer literacy and information literacy in your classroom? This refers to integration literacy where you use technology to enhance the learning experience of the student.

In order to use the computer, specific software is needed. First, we explored what system software is; more specifically the operating system; and then we looked at application software. Not only is application software of importance, but also the software used on mobile devices like tablets or smartphones. This software is called applications.

Lastly, the focus was on the security issues around using the computer. A variety of security risks was mentioned through accessing YouTube videos and websites. In addition, safeguards on how to protect you and your computer from security risks were discussed. The section ended by determining ethical ways of treating people online.

4.7 MORE IDEAS / WEBSITES TO VISIT

Videos	**Link**
Computer Literacy	
Computer basics (26:24)	https://www.youtube.com/watch?v=fdSPUKSe_Xk
Inside your computer (4:11)	https://www.youtube.com/watch?v=AkFi90lZmXA
Common uses of computers in society (16:09)	https://www.youtube.com/watch?v=bes03p6qQzg
Uses of computers (15:58)	https://www.youtube.com/watch?v=7qOF5ffTDI8

Information Literacy	
5 Components of information literacy	https://www.youtube.com/watch?v=1ronp6lue9w
Evaluate websites with 5 W's	https://www.youtube.com/watch?v=OPI7FVon29k
Integration Literacy	
The future of learning Sugata Mitra (2015) 1:03:15	https://www.youtube.com/watch?v=y-e9WRMWcdI
Myths of mobile learning	https://www.youtube.com/watch?v=ESQNcHbmzQQ (3:00)
Apps to use	https://www.youtube.com/watch?v=WnpYy7ASfvQ (16:33)
9 Applications	https://www.youtube.com/watch?v=7Se2bY44UhY (6:41)
5 Best teacher apps for android	https://www.youtube.com/watch?v=N5gk3hp4UaU (5:37)
Google classroom	https://www.youtube.com/watch?v=Yiu3dBeSI_A (12:17)
Operating system	https://www.youtube.com/watch?v=pTdSs8kQqSA (2:13)
Evaluate software	
Engaging activities	https://education.smarttech.com/en/products/smart-learning-suite/smart-lab
Cyber security	https://www.youtube.com/watch?v=W4zgaKVHB-c (3:30)
Security risks	
Confession of a cyber-spy hunter	https://www.youtube.com/watch?v=YiUN35Ikdfw (20:48)
Block and allow applications to access the Internet	https://www.youtube.com/watch?v=RVhpUX6ymho (7:01)
Change the way you teach	
Singapore's 21st-Century Teaching Strategies	https://www.youtube.com/watch?v=M_pIK7ghGw4
Finland	https://www.youtube.com/watch?v=UfmFIEh2QjU https://www.youtube.com/watch?v=1_gyVPzbB_Y

Websites	**Link**
Search engines and tips; Photos and images, statistics; Reliable websites; Unofficial websites and shortcuts	**http://www.bbc.co.uk/schools/gcsebitesize/dida/using_ict/webresearchrev1.shtml**

Evaluate websites	https://ccconline.libguides.com/c.php?g=242130&p=1609638 https://www.thoughtco.com/gauging-website-reliability-2073838 https://uknowit.uwgb.edu/page.php?id=30276 https://www.edb.utexas.edu/petrosino/Legacy_Cycle/mf_jm/Challenge%201/website%20reliable.pdf http://etc.usf.edu/techease/win/internet/how-can-my-students-know-if-a-web-source-is-reliable/ http://www.kognity.com/online-reliable-sources/
I have a dream (Martin Luther King jr, 1963)	https://www.archives.gov/files/press/exhibits/dream-speech.pdf
Resources	http://www.edinformatics.com/education/computers/
11 Most common computer security threats	http://www.symantec-norton.com/11-most-common-computer-security-threats_k13.aspx
Computer crime	https://www.computerhope.com/jargon/c/compcrim.htm
Anti-virus for Android	http://www.techradar.com/news/top-10-best-antivirus-apps-for-android-in-2017

GLOSSARY

LEARNING UNIT ONE

Information and Communication Technology	The infrastructure and components that enable modern computing?
Integration of ICT	ICT integration is defined as the use of ICT to introduce, reinforce, supplement and extend skills (Pisapia, 1994).
e-Learning	e-Learning is learning by utilising electronic technologies to access educational curriculum outside of a traditional classroom
Internet	Internet is the global communication network that allows almost all computers worldwide to connect and exchange information
Paperless Classroom	A paperless classroom where paper documents (textbooks, homework submissions, grade reports) are replaced by electronic documents.
Tablet computers	A tablet, or tablet PC is a portable computer that uses a touch screen as its primary input device.
Interactive white board	An interactive whiteboard is an instructional tool that allows computer images to be displayed onto a board, using a digital projector.
ICT infrastructure	The infrastructure and components that enable modern computing.
Technology-integrated lesson	Technology integration is an important way to create meaningful learning experiences. Lesson planning for teachers can be overwhelming when incorporating the use of computers in activities.
Application packages	An application package that is created for a specific purpose.
Mobile digital resources	A mobile device (or handheld computer) is a computing device small enough to hold and operate in the hand.
Digital natives	A person born or brought up during the age of digital technology and so familiar with computers and the Internet from an early age.

LEARNING UNIT TWO

BYOD	Bring your own device. In a BYOD environment, no preference is given to the use of any one specific device, but users can use any device such as a tablet, laptop, smartphone to do an activity.
ICT	Information and communication technology. This refers to technology such as computers, laptops, mobile phones, interactive whiteboards and more.
Learning management system	Software used to develop, assign and track online learning (Fenton, 2017).

LEARNING UNIT THREE

YouTube	Video sharing website
QR code	Barcode with hidden codes
WWW	World Wide Web

LEARNING UNIT FOUR

Blended learning	The range of possibilities presented by combining the internet and digital media with established classroom forms that require the physical co-presence of a lecturer and students (Friesen 2012), because blended learning is a combination of face-to-face teaching and e-learning that best exploits both these approaches (Aleksić and Ivanović 2013).
Learning management system	Software used to develop, assign and track online learning (Fenton, 2017).
Mobile learning	Simplistic definition – learning through mobile devices (Maxwell, 2012)

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