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EIN O57:   INTRODUCTION TO ICT INTEGRATION IN TEACHING

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UNIT 1: THE ROLE OF COMPUTERS IN TEACHING

Computers are becoming an integral and inseparable aspect of human lives, especially education. The use of computers has made education not only more interesting to learners but had also opened up entirely novel perspectives in education such as web portals and academic sites to name a few. Needless to say, computers have great potential in the field of education and are being integrated into classrooms to augment and amplify the learning and teaching processes. The importance and benefits of using computers in classroom education have been confirmed by researchers who affirm using them facilitates the teaching process and the learning process with the help of various tools available to all involved in the process of education (Angeli, 2008).

This unit is put into the following sessions:

Session 1: Rational for acquiring computer using proficiency in teaching

Session 2: Knowledge and skills required for computer use in teaching

Session 3: Distinctions between computer use for teaching and computer specialization

Session 4: Principles for Implementing ICT in Education

Each Unit is broken down into sessions. At the end of each session, there are scenarios.

Learning outcomes

On successful completion of the unit, the participant will be able to:

-discuss the rationale for acquiring computer using proficiency in teaching

-demonstrate Knowledge and skills required for computer use in teaching

-discuss the distinctions between computer use for teaching and computer specialization

-explain the principles for Implementing ICT in Education

Session 1: Rational for acquiring computer using proficiency in teaching.

Technology in the Classroom Provides Teachers With More Tools To Support Students. In addition to resources like textbooks and worksheets, technology equips educators with various tools to help students develop a better understanding of the material.

Learning outcomes

By the end of this session, the participant will be able to:

- State and explain the rationale for acquiring computer proficiency in teaching

Here are the top three reasons why teachers should use technology in the classroom.
1. Technology in the classroom provides teachers with more tools to support students.
In addition to resources like textbooks and worksheets, technology equips educators with various tools to help students develop a better understanding of the material. This is because students learn in unique ways, incorporating more learning methods increases the likelihood that all of your students will grasp the concepts you teach.

Technology accommodates a variety of learning methods. Whether students learn best through lectures, reading, examples, or video, technology allows teachers to accommodate every learning style.
Students can learn via online videos, audiobooks, interactive online games, and more, all at their own pace. And because online content is easily updated, you and your students can immediately access the most recent information.

2. Students become active participants in the learning process by using technology in the classroom.
The traditional teaching method is for an educator to stand at the front of the classroom and deliver information about a subject. In this classic lecture style, students are passive participants. In other words, they only receive information.
Technology in the classroom helps students engage with the material they are learning. From online educational games to immersive virtual reality, Technology enables students to become active learners. For example, challenge-based gamification can improve students' performance.

Technological resources frequently used in education include:
- Interactive online quizzes, such as Kahoots or Quizlet.
- Virtual games or simulations where students put knowledge into action.
- A smart board or interactive portable whiteboard, where students can diagram a sentence, solve a math equation, and more.
- Access to computers for online research.
- Online video series that dives deeper into subjects.
- Presentation tools, such as PowerPoint, Canva, and Prezi.

Technological tools do not have to cost a lot. There are multiple free resources you can use to enhance your students' education.

3. Teachers who become experts at using technology in the classroom can advance their careers.
In addition to the standard knowledge and skills required, more institutions seek educators who have experience using technology in the classroom. The educational technology field offers education professionals incredible opportunities to advance their careers. As more educational institutions adopt technology in the classroom and as technology rapidly expands, new job opportunities continue to emerge.

Common educational technology roles include:
- Academic Operations Manager
- Chief Learning/Technology Officer
- Classroom Teacher
- Curriculum Design Manager
- Director of Online Learning
- Innovation Director
- Instructional Designer

Key ideas

Technology **provides students with easy-to-access information, accelerated learning, and fun opportunities to practice what they learn**. It enables students to explore new subjects and deepen their understanding of difficult concepts, particularly in STEM

Efficiency. The learning process gets much simple and efficient when there is the use of computers. **The students get access to new tools and methods of communication**. This helps them to have online communication with their teachers

Reflections

Scenario
Discussion
Discuss the rationale for acquiring computer proficiency in teaching

Session 2: Knowledge and skills required for computer use in teaching

With technology becoming more prevalent in the workspace, it is important to have a solid foundation of computer skills. Depending on your work experience, job role and industry, the computer skills you need may vary. Knowing about the different types of computer skills can help you understand what skills you might require in your field. In this article, we define the various types of basic computer skills with examples, understand their importance and learn how to improve them and highlight them on your resume.

Learning outcomes

By the end of this session, the participant will be able to:
- demonstrate Knowledge and skills required for computer use in teaching

Basic computer skills refer to the ability to use computers and related technology to perform fundamental tasks. Using these skills, you can make presentations, work with application software, access databases, communicate with team members and create beautiful designs. The type of computer skills you use depends on your job role and industry. For example, marketers are likely to use digital marketing tools, whereas accountants use accounting software.

Importance of Computer Skills

As companies are becoming increasingly dependent on digital tools, employers often prefer candidates who can operate those tools. Knowing the fundamentals of computers is important for the following reasons:

- **Fosters efficient ways of working:** Knowing the basics helps you streamline your everyday tasks. This allows you more time to focus on other areas of your job role. For example, a graphic designer can create a flyer design using illustration software.
- **Streamlines communication:** Being able to use the basic technology required for your job role makes it easier to work with stakeholders, team members and clients. You can easily connect and share information with them using communications tools.
- **Helps in career advancement:** Being able to use computer tools relevant to your job allows you to work on more challenging projects and helps you get a job faster than candidates who lack these skills. For example, a graduate with experience in using website analytics is likely to get hired faster than someone with no experience in this tool.

Examples of Basic Computer Skills

Here are a few examples of these skills:

Digital marketing

In digital marketing, you advertise a company's products and services using digital channels like websites, emails, mobile apps and social media. Companies use these channels to promote their brand and connect with current and prospective customers. This ultimately helps them grow their business. Furthermore, using various tools, companies can easily target and reach their audience. Some essential digital marketing skills that require basic computer literacy are:

- Email marketing
- Content management system (CMS)
- Website analytics
- Social media management (SMM)
- Search engine optimisation (SEO)
- Pay-per-click advertising (PPC)
- Content marketing

When applying for a marketing or sales role, you can mention how these skills helped you excel at your workplace. For example, if you used content marketing, you can describe how your content helped in increasing the website traffic and what value it imparted to your customers. Quantifying the results can help an employer understand that you can use your skills to help their company grow.

Graphic design

Creating visually beautiful slides, posters, marketing materials and presentations is one of the most desired skills. With graphic design skills, you can edit photos, design leaflets, create headers and banners for a website. The various graphic design skills that can increase your chances of getting shortlisted for an interview are:

- Video creation software
- Design software
- Photo editing and manipulation software
- Vector-based graphic software
- Desktop publishing

On your resume, you can highlight the graphic software tools you used in a previous. Try to give detailed information on your expertise with a particular tool, as it helps an employer gauge your abilities.

Database management

A database is an electronic collection of structured data or information that is accessible on a computer. It can store various information such as payroll, customer and employee information and inventory details. To manage a database, you require the following skills:

- SQL

- Microsoft Excel
- Spreadsheets
- Data analytics

You can highlight your database management skills by explaining how you structured data in your previous organisation to help streamline business operations.

Productivity software

These are application software that helps you become more efficient in your day-to-day activities. For example, using productivity software, you can produce documents, worksheets, graphs and presentations. Some types of productivity software that requires fundamental computer skills are:

- Word processing software
- Digital calendars
- Spreadsheet software
- File sharing software
- Video conferencing tools
- Cloud backup software
- Instant messaging

When writing your resume, rather than stating your ability to use digital calendars, showcase how the digital calendars helped you become productive in your previous job.

IT troubleshooting

When you use computers, you are likely to encounter problems such as frozen screens, slow Internet, overheating, dropped Internet connection or damaged USB ports. The ability to troubleshoot these problems without seeking professional help is a desirable skill. For example, when your computer shows network issues, you may be required to find your IP address, verify that your computer is connected to the Internet and try reconnecting again. Some of the basic IT troubleshooting skills are:

- Modem hardware troubleshooting
- Router troubleshooting
- Software troubleshooting

To highlight this skill set, try giving real-life examples of how a slow Internet connection was causing issues and how you used your troubleshooting skills to overcome the problem.

Accounting software

If you are applying for an accounting role, it is important to possess strong computer skills related to this field. Some types of accounting software are:

- Spreadsheets
- Custom accounting software
- Accounting information systems

On your resume or profile summary, you can mention the level of proficiency and experience you have using such software. Often, basic knowledge of accounting software is a requirement for many accounting-related jobs.

Email and other communication software

Communication is vital for every company. Good communication fosters collaboration between employees and departments. Also, effective communication increases productivity and makes a company more efficient. In your workplace, some of the most important email and communication software are:

- Online messaging software
- Email management application
- Video conferencing software

When including this skill set in your resume, read the job description to understand which communication and email software your prospective employer is likely to use and list your relevant skills.

How To Improve Your Computer Skills?

Here are a few ways to improve these skills:

1. Understand computer basics

Before sharpening your computer skills, you are required to understand how a computer works. Learning the basics like typing, navigating a computer or browsing the Internet gives you a firm base to build upon.

2. Stay focused

If you are learning or improving your existing computer skill, you are required to remain focused. The more focused you are, the more quickly you can improve and use the skill at your workplace.

3. Get practical experience

To improve your skills, try to apply them. For example, if you are learning a new communication tool, take time to learn the tool and use it in your everyday life to get some practical experience of using it.

To learn these basic skills, you can enroll in a course in the area you wish to learn and improve. You can either enroll in a classroom or online course based on your convenience. For example, if you want to pursue a career in database management, you can take an online course on SQL or data analytics.

What skills are developed in the technologies?

The technologies provide frequent opportunities for active learning in creative and work-related contexts. Learning in the technologies thus provides opportunities to continually develop, use and extend skills that are essential components for life, work and learning, now and in the future, including planning and organisational skills. Well-designed practical activities in the technologies offer children and young people opportunities to develop:

• curiosity and problem-solving skills, a capacity to work with others and take initiative
• planning and organisational skills in a range of contexts
• creativity and innovation, for example though ICT and computer aided design and manufacturing approaches
• skills in using tools, equipment, software and materials
• skills in collaborating, leading and interacting with others Technologies: principles and practice 2
• critical thinking through exploration and discovery within a range of learning contexts
• discussion and debate
• searching and retrieving information to inform thinking within diverse learning contexts
• making connections between specialist skills developed within learning and skills for work
• evaluating products, systems and services
• presentation skills.

Key ideas

Basic computer knowledge is about how computers work and how to use them. This may include typing, learning keyboard commands, powering a computer on and off, knowing how to connect and disconnect the Internet to a computer. It can help you understand different operating systems and application software. Whether you are a college graduate, salesperson, marketer, copywriter, teacher or working professional, you are required to know the computer basics. Having basic computer knowledge makes it easier to complete everyday tasks and increase workplace productivity.

Reflections

Scenario

Discussion
As a teacher How Can I Learn Computer Basic Skills?

Session 3: Distinctions between computer use for teaching and computer specialization

Learning outcomes

By the end of this session, the participant will be able to:

- **discuss the distinctions between computer use for teaching and computer specialization**

Computer as Tutor

In the role of a tutor, the computer is typically used as a teaching machine, that is, to teach new content to students. If you have ever set up a new computer system using the CD-ROM that comes packaged with it or have worked your way through a tutorial to learn a new piece of software, then you have used the computer as a tutor. Although
this role for technology is typically associated with directed instruction in which the
goal is for students to master new skills or to improve retention of new information,
the tutor model can be adapted to teach more abstract and complex reasoning skills.
In addition, many existing computer tutorials can be used to prompt student inquiry or to frame student discussion and reflection, even though this was not the original purpose for the software program.

Computer-Based Tutorials
Computer-based tutorials typically provide a complete lesson on a specific topic
Including:
1) presenting new information
2) providing practice
3) evaluating student learning

Computer tutorials, especially when delivered via intelligent tutoring systems, have the advantage of being able to provide sophisticated feedback at the level needed by individual students. An intelligent tutoring system (ITS) is a type of educational software that can track student responses; make inferences about his/her strengths and weaknesses; and then tailor feedback, provide additional exercises, or offer hints to improve performance. The software is said to *act intelligently*, not actually to be intelligent. Other names for this type of software include *integrated learning software* (ILS) and *computer-adapted instruction* (CAI). Because an ITS uses sophisticated language and branching (i.e., sequencing the way information is presented

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based on students' previous responses), it can promote the kind of creative thinking desired. For example, *Cognitive Tutor* is a mathematics intelligent tutoring system, developed by researchers at Carnegie Mellon University, to help middle and high school students learn math. According to the authors (Carnegie Learning, 2006), Cognitive Tutor provides students with the benefits of individualized instruction, ample practice, immediate feedback, and coaching. As an intelligent tutoring system, the program combines individualized computer-based lessons with collaborative, real-world problem-solving activities. To get a sense of how this type of software works, try out *Mrs. Lindquist: The Tutor*, an ITS designed to help students learn how to write algebraic expressions for algebra word problems. Pay attention to the type of feedback the software provides when you make an error and you will see how "intelligent" it appears to be.
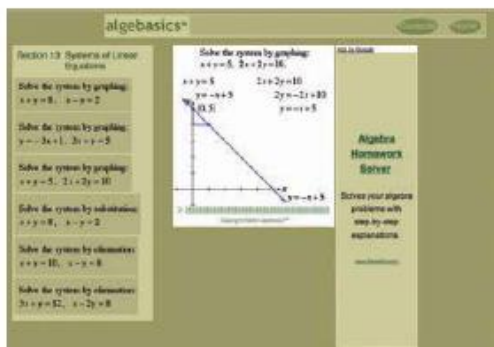
(a)   (b)

Figure 4.1
Computer tutorials cover many subjects, including typing (a) and mathematics (b), shown here.
Source: Courtesy of TypingWeb.com; Mark Basse, Algebasics

With the right teacher input and software design, a computer tutorial can be an effective way to infuse activities that require and develop creative thinking into the curriculum. For example, the teacher can ask students to work in groups around a computer and then when the software prompts them with a challenge or a question, they can discuss the issue together before reaching consensus about what the response should be. Just like a teacher, computer tutorials can initiate or frame a meaningful discussion. Unlike a teacher, however, the software will never be intolerant or pass judgment on students' responses. When used as intended, computer tutorials provide opportunities for students to learn new knowledge or skills. When used in more open-ended ways, they can provide additional opportunities for students to engage in activities that support creative thinking (e.g., reflection, meaningful conversations).

Computer as Mindtool

Mindtools are computer applications that enable learners to represent, manipulate, or reflect on what they know, rather than to reproduce what someone else knows. By requiring students to think about what they know in different, meaningful ways, mindtools engage students in critical thinking about the content they are studying. By functioning as intellectual partners with students, mindtools enable them to act smarter than they would without the tools. For instance, in order for students to create databases, they must engage in analytical reasoning; in

order to create a web page, they must actively construct representations of their thinking. Students cannot use mindtools without thinking deeply about what they are doing.

There are a number of different types of mindtools including databases and concept-mapping tools (also referred to as semantic-organization tools); simulations and visualization tools; and hypertext and hypermedia (referred to as knowledge-building tools). Although other computer applications may also be used as mindtools (e.g., programming software, expert systems, modeling tools), our goal is not to present an exhaustive description of all the possibilities, but to introduce you to the idea of how you can use common software applications as mindtools to promote creative thinking among your students.

Concept Maps

Concept maps are "graphical tools for organizing and representing knowledge". For example, the figure below presents a sample concept map about the seasons.
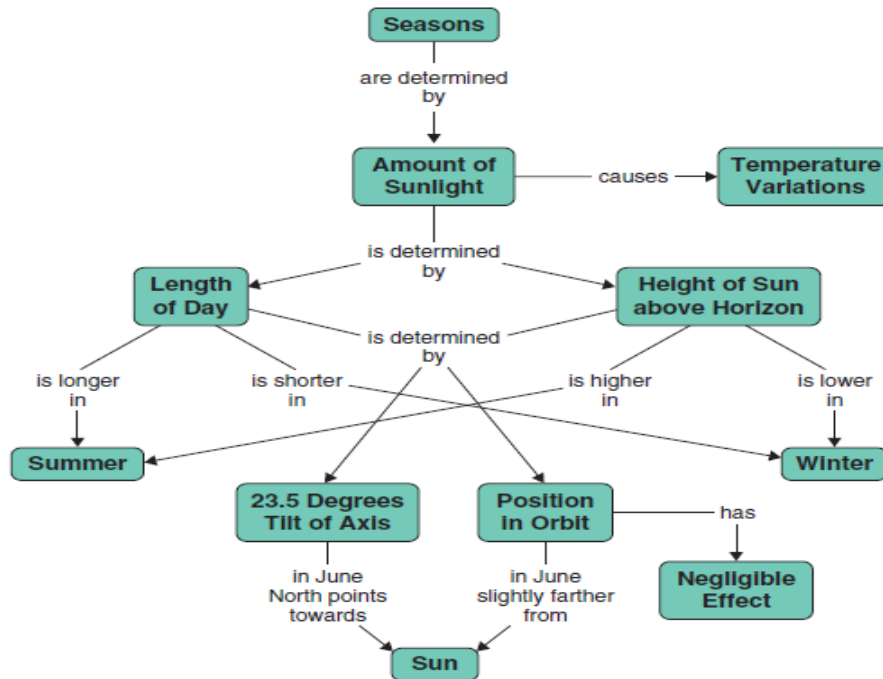
Concepts (e.g., seasons, amount of sunlight) are included inside of circles or boxes, relationships between the concepts are represented by lines or arrows, and labels are used to describe the relationships (e.g., causes, is determined by). The concepts may also be referred to as nodes and the relationships as links. There are many ways to use concept maps: Students can use them to access prior knowledge, to organize and represent current knowledge, and to explore new information and relationships. Creating a concept map involves:

1) identifying the important concepts in a domain of knowledge,
2) arranging those concepts spatially,

3) identifying relationships among the concepts, and
4) labelling the nature of the relationships among those concepts.

Because students have to manipulate information, and think about the relationships among different concepts, creating a concept map encourages convergent thinking. Students are forced to think about how concepts in a domain fit together and to identify additional ideas or concepts that need to be included. There are a variety of software tools that facilitate concept-mapping including MindMap, Inspiration and Kidspiration, and SemNet. Interestingly, even though Inspiration was developed for teachers and students, many scientists, engineers, and other professionals have adopted it as a powerful way to visualize their thinking.

Visualization Tools

Visualization tools allow learners to picture, or represent, how various phenomena operate within different domains. While these tools are often used to help students visualize scientific phenomena, other tools are available that help students understand other types of phenomena, such as the structure of an argument. For example, computer tools are available that enable students to manipulate complex data sets as a way of gaining understanding of statistical arguments. Graphic organizers are a type of visualization tool that can help learners sort or record information. There are many different types of graphic organizers including data grids, tables, diagrams, flowcharts, storyboards, and Venn diagrams.

Concept mapping tools, described earlier, can also be used as graphic organizers. While most of these organizers have been used long before computers were invented, today we have computer software that can simplify the creation of many of them. For example, the *ReadWriteThink* organization makes a tool available on their website that allows users to create Venn diagrams and the popular *Inspiration* concept-mapping software includes a Venn diagram template. Organizations that create visualization tools often provide a number of descriptions of how their tools can be used in the classroom. Inspiration Software's newer tool, InspireData, is a data visualization tool that allows you and your students to easily map and manipulate data, such as what you might collect from a survey, and then share that information with the concept-mapping software.

Key ideas

Difference between ICT and computing ICT, as defined here, brings together different forms of technologies and applies them to communication and learning, whereas computing, as an area of specialised study, provides deeper theoretical and practical understanding of how hardware and software can be developed and applied in a range of contexts. This area of specialist study has particular relevance in preparing children and young people for the challenges of rapidly changing digital technologies. It will enable learners to prepare for more advanced specialised study and careers within computing science.

Reflections

Scenario

Databases and Concept-Mapping Tools
Database and concept-mapping software are computer applications that help students think about, and then communicate, the underlying structure of a content area. Since structure is intrinsic to all knowledge, tools that require students to identify that structure can help increase their understanding of the content. Have you ever made a list of items you want to buy from a supermarket and then organized it by categories in the store so that you could find the items you needed more readily? On a relatively simple level, you structured your list based on your understanding of two things:

1) how the store (content) was organized (e.g., by food types) and
2) how to classify the items on your list into the different categories.
Now, if there were many different ways to classify the items on your list (by quality, supplier, brand names, etc.), and all of them were relevant to your shopping needs, then you would have to think more carefully about how to organize your list.

Discussion

discuss the distinctions between computer use for teaching and computer specialization

Session 4: Principles for Implementing ICT in Education

Learning outcomes

By the end of this session, the participant will be able to:

-Use ICT to achieve education and development goals

- Use ICT to enhance student knowledge and skills

- Use ICT to support data-driven decision making

1. Use ICT to Achieve Education and Development Goals

Technology should be used to address areas where system capacity is poor, schools are underperforming or there are gaps in student learning. A well-designed technology solution can be used to disseminate resources, connect students to information, enhance teachers' practices and students' performance in all subject areas, improve school management and support data-driven policymaking.

Program example: audio-visual lessons and learning materials via computers and mobile devices to assist teachers in assessing individual student needs, bridge gaps in teachers' own teaching skills and knowledge, and create integrated school and community reading programs to improve students' reading skills.

2. Use ICT to Enhance Student Knowledge and Skills

If schooling is intended to be relevant to work and important to a society, success in school should be accompanied by the development of a broad body of knowledge and a complete range of skills—including literacy, numeracy, information literacy and independent-learning skills that contribute to achievement in later life. ICT should be used to help students build these skills.

3. Use ICT to Support Data-driven Decision Making

Regular and reliable data are essential to planning and policy, financial management, management of school facilities, decisions about school personnel (including teachers) and support for student learning.

Program example: the use of mobile application (EscuelaApp) to provide the Ministry of Education with access to data about education services. The application provides access to data on education statistics and indicators to allow policymakers to incorporate evidence-based decision making into their programming.

4. Include All Short- and Longer-term Costs in Budget Planning

Estimating full capital and operating expenses of technology projects in schools requires consideration of all equipment and activities needed to ensure that hardware (and software) are installed, operated, maintained, repaired and replaced, and that teachers and other personnel have the skills and resources they need to use their new tools to meet project goals.

Program example: Appropriate adoption and effective use of technology. Through the private sector partnership "One Laptop per Child" program, the introduction of the use of computers and software as tools to improve early grade reading skills and to expose children to reading materials.

Key ideas

The proliferation of new tools and new approaches is accelerating in both developed and developing countries; these innovations challenge project developers to think creatively about emerging opportunities. Program designers should consider alternative ways of meeting proposed educational objectives, including broadcast or other technologies, low-cost/low-power computers, and mobile telephones.

In-service teacher professional development is frequently among the most important and complex components in an education-technology project. Teachers are essential to student learning outcomes.

It is vital to engage multiple stakeholders in education technology projects, as they frequently cut across several sectors and entail great expense as well as technical and organizational complexity, eg., with the mobile operator to incorporate technology and innovation in outreach and communication as well as monitoring and evaluation activities.

Reflections

Scenario
Discussion
Discuss how ICT will enhance student knowledge and skills

UNIT 2:   INTEGRATING TECHNOLOGY INTO CLASSROOM LESSONS

Technology cannot be integrated into classroom programmes overnight. Imagine yourself teaching a lesson to a classroom of students. Exactly what would you do to convey the necessary information? Would you use technology? If so, what technologies and why? If not, why not? If you are like many college students, computers, cell phones, and other digital tools are interfaces to your life. You communicate there. You think there. You create there. You take care of the day-to-day events of your life there. You are entertained, informed, stimulated, and soothed. Technology provides a window into your world. But have you thought about how you will integrate technology into your teaching?

Session 1: One-computer classroom

Session 2: Multi-computer classroom (Computer Laboratory)

Session 3: Strategies in planning and delivering a lesson with computers.

Session 4: Classroom management plan for using computers.

Learning outcomes

On successful completion of the unit, the participant will be able to:

-discuss one-computer classroom

- discuss multi-computer classroom (Computer Laboratory)

-discuss the strategies in planning and delivering a lesson with computers.

-explain some classroom management plan for using computers

Session 1: One-computer classroom

Technology integration is the combination of all technology parts, such as hardware and software, together with each subject-related area of curriculum to enhance learning. Technology integration is using technology to help meet the curriculum standards and learner outcomes of each lesson, unit, or activity. In other words it is the incorporation of technology resources and technology-based practices into daily routines, work, and management of schools. Technology resources are computers and specialized software, network-based communication systems, and other equipment and infrastructure. Practices include collaborative work and communication, Internet-based research, remote access to instrumentation, network-based transmission and retrieval of data, and other methods.

Learning outcomes

By the end of this session, the participant will be able to:

- Use the Computer as Teacher Tool
- Use the Computer as Multi-media Chalk Board or Flip Chart
- Communicate with E-mail other students/classrooms, other teachers, subject experts

The one-computer classroom is a classroom with one multimedia computer, most commonly used for classroom presentations and demonstrations. The most important advantage of using a computer laboratory is that all students are provided hands-on experience with using computer technology. The computer in the one-computer classroom may be used in the following ways:

1.Administrative tool / Use the Computer as Teacher Tool

Word processor- letters, class notes, quizzes, word searches

Test generator

Attendance and grade book

Communications- e-mail other teachers, join educational listservs

Research tool- educational CDs, Internet

2. Presentation tool (Use the Computer as Multi-media Chalk Board or Flip Chart:

(whole class on TV monitor or overhead or small group on the computer monitor)

For teachers: Display notes, quizzes, video clips, etc., Science/math class to create graphs,

charts, Demonstrate computer basic skills/training, Review information/drill facts

For students: Use with oral reports, Show multimedia projects

3. Communication station E-mail other students/classrooms, other teachers, subject experts.

http://www.askanexpert.com Quick Cam to take pictures of students or communicate face to face

4. Information station Use CD-ROM encyclopedia for research, pictures, video and sound clips, etc.

Use Internet to access libraries, projects, databases, addresses, etc.

5. Publishing tool

Monthly class magazine, newsletter, anthologies Classroom journal, Ongoing story center, Brochure for project, Web publishing

6**. Learning center Specific content software to reinforce or remediate skills** (drill and practice) Use templates for student projects

7. Simulation center Use specialized software to create simulations (i.e. Tom Snyder's software)

Form teams of students, Students complete worksheet as they work through the program students make predictions.

8. Use the Computer as Cooperative Learning Tool:

(Use for writing, organizing, synthesizing, brainstorming, comparing, contrasting, etc.)

9.Have Students Use the Computer to do Individual Work for Practice or Assessment:

Correct a sentence, Practice typing a pattern

Type part of a final copy for a project - for example: the bibliography or outline for a research paper, Take a quiz

Key ideas

A single classroom computer can be used effectively as **a presentation tool, a tool for generation or production of student work, a cooperative learning tool, and an in-class information resource**

Reflections

Scenario
Discussion
What can a teacher do with one computer in a classroom?

Session 2: Multi-computer classroom (Computer Laboratory)

Learning outcomes

By the end of this session, the participant will be able to:
- Create collaborative learning situations

- Take advantage of small-group instruction by visiting each group individually and guiding

A multi-computer classroom is a classroom with several computers and will have computers available whenever the students need them, enabling "teachable moments" throughout the day. Many researchers agree that a minimum of three computers in the classroom is needed to ensure that every students gets some time at the computer during a single classroom period -- obviously, the more computers, the better -- especially if the class is large. The number of computers and students in your classroom will determine how large the groups must be or how many rotations of groups it will take for every group (or every student) to have time on the computer. While students are waiting for their group's turn at a computer, they can work on related, non-computer tasks.

For example, some groups may be collecting data, while others are inputting the data into spreadsheets.

1. Create collaborative learning situations-four or five students on each computer. This will be difficult if the computers are lined up tightly along one wall. A better classroom arrangement is to spread the computers around the room using all four walls. This configuration allows room for groups of students to work collaboratively on each computer.

2. Take advantage of small-group instruction by visiting each group individually and guiding. Provide for individualized learning by facilitating the activities of each group.

Key ideas

Multi-Computer Classroom Versus Computer Laboratory
1. Unlike a computer lab, a classroom with several computers will have computers available whenever the students need them, enabling "teachable moments" throughout the day.

2. In addition, students will be able to leave projects that are "in progress" on classroom computers, knowing that other classes will not be using the computers.

3. Computers in the classroom provide more flexibility than going to a computer lab, but less flexibility than having laptops available for students.

Reflections

Scenario
Discussion
Discuss collaborative learning situations.

Session 3: Strategies in planning and delivering a lesson with computers.

Learning outcomes

By the end of this session, the participant will be able to:

- Plan Lessons to Integrate Technology

- Develop an Integration Plan

Lesson Planning to Integrate Technology

Teachers must plan carefully for the use and integration of computers and technologies in the classroom. They must plan how they will teach the curriculum, what areas they need to cover for content, and where they can use technology to meet learning objectives. Whether teachers use one computer, two computers, or thirty computers, however, they must plan how and when to use the computers and how they will enable students to use the computers.

School district administrators must plan carefully for every aspect of curriculum integration, from purchase, to installation, to teacher and staff training. Almost every school district has a detailed technology plan for curriculum integration. A technology plan is an outline that specifies the school district's procedures not only for purchasing equipment and software, but also for training teachers to use and then integrate technology into their classroom teaching.

Develop an Integration Plan

- A plan helps the teacher purposefully select what integrated technology instruction will occur in his classroom. When planning lessons that use technology, teachers must consider the skills and knowledge level required for students to start and complete the lesson successfully. A KWL chart is a helpful planning tool in determining the skill and knowledge level of students prior to beginning almost any project. An instructional model is a systematic guide for planning instruction or a lesson. The ASSURE Model is a procedural guide for planning and delivering instruction that integrates technologies and media into the teaching process.

The following are involved in planning for Technology Integration in the Classroom:

1. Planning Lessons with Technology

2. The ASSURE Model

3. KWL Charts

- Putting It All Together - Creating an Integrated Learning Environment

a. Planning Lessons with Technology

To be successful when integrating technology, teachers must rethink and redesign activities and create new teaching and learning strategies.

New technology tools require new instructional lessons.

Teachers do not have to originate and create technology-enriched lesson plans and activities. They may find a multitude of lesson plans and activities at thousands of educational Web sites.

Many educational Websites provide search engines that allow teachers to locate curriculum-specific lesson plans and activities for almost most curriculum areas

b. The ASSURE Model
The ASSURE model is an ISD (Instructional Systems Design) process that was modified to be used by teachers in the regular classroom. The ISD process is one in which teachers and trainers can use to design and develop the most appropriate learning environment for their students.
You can use this process in writing your lesson plans and improving teaching and learning. The ASSURE model incorporates Robert Gagne's events of instruction to assure effective use of media in instruction.
- The ASSURE model involves the following steps:

i. **A**nalyze learners such as entry behaviour, learning styles and bio data;
ii. **S**tate objectives;
iii. **S**elect instructional methods, media, and materials that will suit lesson;
iv. **U**tilize media and materials;
v. **R**equire learner participation or active involvement; and
vi. **E**valuate and revise i.e. reflect upon all aspects of the lesson.

c. KWL Charts

K-W-L is an introductory strategy that provides a structure for recalling what students know about a topic, noting what students want to know, and finally listing what has been learned and is yet to be learned. K-W-L is also the creation of a 3-column chart that helps capture the Before, During, and After components of reading a text selection. Teachers activate students' prior knowledge by asking them what they already **K**now; then students (collaborating as a classroom unit or within small groups) set goals specifying what they **W**ant to learn; and after reading students discuss what they have **L**earned. Students apply higher-order thinking strategies which help them construct meaning from what they read and help them monitor their progress toward their goals. A worksheet is given to every student that includes columns for each of these activities.

K stands for **Know** i.e. what do students already **know** about this topic?

W stands for **Will or Want** i.e. what do you think students will learn about this topic? What do I want to know about this topic?

L stands for **Learned** i.e. what have I learned about this topic?

The following strategies should be used:

1. One-Computer Classroom

2. Multi-Computer Classroom (computer laboratory)

3. Classroom Management Plan

Key ideas

What is its purpose? The K-W-L strategy allows students to take inventory of what they already know and what they want to know. Students can categorize information about the topic that they expect to use.

Integrating Technology into Teaching & Learning
As students begin to play a more active role in the learning process, the teacher's role must change. Teachers are transitioning from the conventional lecture-practice-recall teaching methods to being the facilitator of learning. Rather than dictating a learning process, a facilitator of learning motivates students to want to learn, guides the student learning process, and promotes a learning atmosphere and an appreciation for the subject.

To help meet the constant challenge of motivating students to learn, teachers must change their traditional roles to become facilitators of learning. Instructional strategies help teachers integrate technology into a one-computer classroom, a multi-computer classroom, and a computer laboratory.

4.
5. Reflections

Scenario
Discussion
Write a lesson plan that integrates technology

Session 4: Classroom management plan for using computers.

Learning outcomes

By the end of this session, the participant will be able to:

-organize, communicate, monitor, and deliver instruction

Classroom management plan involves preventing the frequent occurrence of problems and also responding effectively when problems occur. The most effective decisions in classroom management are based on a clear concept of the Goals and **Intended outcomes that a teacher wishes to accomplish.**

 Classroom management plan entails the following:

1. Organization
2. Communication
3. Monitoring
4. Delivery of Instruction

Organization

These are the rules and procedures that should be developed in conjunction with teaching strategies that help students meet their personal and academic needs.

- Arrange seating in a U-shape, rows or a circle, so that you can see and easily move close to students.

- Post a daily schedule and discuss any changes each morning.

- Engage students until you have given clear instructions for the upcoming activity.

- Encourage students to take responsibility for their learning by determining not to do tasks that can be done by students.

- Establish routines for collecting homework, distributing papers, etc.

- Move around the room and attend to individual needs.

- Provide simple step-by-step directions.

- Remind students of key procedures associated with the upcoming lesson.

- Use group competition to stimulate more orderly transitions.

- Develop transition activities--Implement structured activities that help students make transitions between active

2. *Communication*

Effective communication is the foundation for good classroom management. Communication skills can be divided

into two categories: sending and receiving.

a. **Sending Skills (skills used when speaking to someone):**

- Deal in the present. Information is more useful when it is shared at the earliest appropriate opportunity.

- Talk directly to students rather than about them. When teachers do this, students are shown respect, and receive

- accurate information about adults' feelings.

- Speak courteously. This creates positive role models for students.

- Take responsibility for statements by using the personal pronoun ``I.'' Example: ``when I'm interrupted, I get distracted

- and have difficulty helping other students.''

- Make statements rather than asking questions. When dealing with students' behaviors, questions often create defensiveness.

b. Receiving Skills (techniques for becoming a more effective listener):

- Use empathetic, non-evaluative listening. This makes the speaker feel that he or she has been clearly heard and that the feelings expressed are acceptable.

- Use paraphrasing, active listening, or reflecting in order to make the speaker feel heard. This allows the listener to become involved in the dialogue.

- Make eye contact and be aware of nonverbal messages.

- Suggest strong leadership by using body language, facial expressions, and gestures

Monitoring

- Often misbehavior occurs because students find ``acting out'' more interesting than a boring lesson or more rewarding than another failure experience. Students may also misbehave when they are not involved in the learning activity, do not understand the task, or cannot obtain assistance when it is needed. The following are useful techniques for responding to minor classroom disruptions:

- Scan the class frequently in order to notice and respond to potential problems.

- React calmly and quickly to a student's disruptive behavior in order to create a positive ripple effect.

- Make positive initial contact with students by praising the positive behavior that competes with the negative behavior.

- Remind students of the classroom rule or procedure that they are not demonstrating.

- Make students clearly aware of the rules and procedures and the consequence for violations.

- Give students clear cues indicating that continuation of a behavior will evoke the specified consequences.

- Employ consistent consequences for misbehaviours.
- Inform students that they are choosing the consequence of their behaviour.
- Use consequences, which are educational in nature.
- When one or two students are being very disruptive, focus other students in the class on their task. Then find a time to talk quietly with the disruptive students

Delivery of Instruction

- Leading educators over the past several years have emphasized that quality of instruction is a key factor influencing students' behaviour and achievement. Response to student misbehaviour is most effective when it maintains or enhances the student's dignity and self-esteem and encourages the student to be responsible for his or her own behaviour.

- Involve students in evaluating their own work as well as your instruction.

- Hand out an outline, definitions, or study guide to help students organize their thoughts and focus their attention.

- Ask the question and give ample wait time before calling on the student.

- Vary style as well as the content of instruction in order to address diverse student learning styles.

- Provide work of appropriate difficulty to complement varying ability levels.

- Relate materials to students' lives whenever possible.

- Be animated, create anticipation, and use activities to catch student interest or increase student motivation to participate.

- Engage student learning through cooperative group work, competitive teams, group discussions, debates, and role playing.

- The success for teaching with technology depends on the adoption of new teaching strategies. Strategies vary with respect to the level of educands, and the type of subject to be taught. Initial strategy can focus on encouraging teacher training in new technologies and the provision of hardware in schools. The curriculum identifies a core set of IT capabilities and stresses that applying them across subject areas should develop these. Software packages, Physical facilities, Furniture, and Supplies must also be made available through government funding, PTAs, NGOs and other stakeholders.

It is amazing how much a learning environment can change when technology is added to the traditional classroom! While technology is not essential to creating authentic, learner-centred instruction, it offers a powerful resource for engaging students in authentic experiences, typically

increasing both their motivation and their learning. Authentic instructional methods can support the development of creative thinking skills by providing opportunities for students to engage in holistic, complex, and challenging activities that promote learner autonomy and active learning; how directed instruction can support authentic learning; how content standards can be taught through authentic learning experiences; and how technologies could support both authentic learning and directed instruction. In this unit, you will begin to think about designing learning experiences that incorporate digital tools and resources to promote student learning and creativity. There are three primary roles that the computer can serve: *computer as tutor*, *computer as mindtool*, and *computer as a support for reflection and conversation.* This categorization provides us with a starting point for thinking about different ways we can use technology to engage our students in creative thinking. Although we use the word —computer— we are not just talking about a desktop or laptop computer. Many of the applications and activities described in this unit are supported by a range of technologies, from handhelds (PDAs), to calculators, and even to some cell phones. And since we often use the web to locate instructional resources, we will also discuss strategies to assist in locating reputable resources that can be used as tutorials, mindtools, and supports for conversations.

Key ideas

The key to successful technology integration is identifying what you are trying to accomplish within your curriculum. Teachers must consider what the curriculum standards and benchmarks are, identify an appropriate technology, and develop innovative ways to teach a diverse population of learners with different learning styles. A learning style refers to how individuals learn, including how they prefer to receive information, express themselves, and process information.

The conditions necessary in a school to support the integration of technology are the physical facilities, capacity, and conditions, curricular connections, teacher actions and characteristics, student activities, and support.

Reflections

Scenario
Discussion
organize, communicate, monitor, and deliver instruction

UNIT 3:   TEACHING WITH APPLICATION SOFTWARE

UNIT INTRODUCTION

Most schools in Ghana today can boast of having computers and not just that but actually using them. The important issue is what they are using them for. This depends on what they know about their use. If teachers know what these computers can do they will use them for instruction. The computer has application software including word processors, media players and accounting software. One of the most powerful application software tools that make the computer useful for instruction is Microsoft windows. Microsoft windows dominate the world as far as the wide scale use of computers in teaching is concerned. Its potentials continue to expand with the discovery and addition of more and more capabilities. It can be used in a variety of ways by diverse users and can be directed to different tasks. The school related tasks are the focus of this unit. In this unit we will discuss the different application software found on the computer and their uses in teaching and learning. You will be taken through the following sessions in this unit:

Session 1: Using word processers in teaching

Session 2: Using spreadsheets and databases in teaching

Session 3: Teaching with Presentation Software

Session 4: Using computers for other teaching objectives.

Session 1:   USING WORD PROCESSORS IN TEACHING

Objectives

1. Identify the main features of word processors.

2. Describe the ways in which teachers can use word processors in teaching.

3. Describe the ways in which learners can use word processors in learning.

4. Explain the benefits of using word processors in teaching and learning.

Introduction

Dear student, I believe you are familiar with the operation of a word processor and know some of the ways you can use it for your own work. In this session we will be interested in how we can use it for your own teaching-related tasks. We will be looking at some worthwhile ways to involve students with this application in our teaching.

One of the major aspects of schooling is teaching students to deal with the written word. Due to this, the word processor can become a useful partner in the process. One of the strengths of the word processor lies in its ability to help us do what English teachers have always wished, which is to involve our pupils in writing. It is clear that students do not write as much as they should. As teachers we do not give them enough writing tasks because the task of assigning, collecting, reading, and passing back numerous writing assignments is a burdensome one. We know that

unless they have interest in writing, it is not easy for students, either. Although some students do enjoy the challenge of writing, large numbers find writing to be laborious, dull, and lacking in rewards. Now, if writing is problematic, rewriting must be worse. After all, a second draft means a second round of reading for teachers. While some students appreciate opportunities to mold their ideas through rereading, rethinking, and rewriting, others view any revision as a taxing process. Rewriting becomes particularly arduous for students for whom error-free composition seems out of reach. Okay, this is the good news. Word processors are facilitators of text production and modification. They have much to offer both teachers and students in the writing and rewriting process.

Although we do not yet know all the benefits of using word processers in the classroom, some research (Wresch, 1984) tells us that when students use word processors, they tend to write more, revise more and develop a better attitude toward the writing process. Word processors seem to improve students' attitudes toward writing for three reasons: First, the use of computers is still seem by our young learners as novel and interesting. Second, students may feel they are engaged in an important idea, since it warrants the use of a computer to fulfill the task. Third, the products of their effort can be neatly printed on paper with the appearance of professional documents. Students find this exciting. Because the writing process is simplified, and corrections are easy to make, the research shows that students tend to more writing and more correcting. This does not mean, of course, that students' produce better writing, but eventually they improve a lot. At least we know that using word processing produces students who have a better attitude toward writing in general and do more of it. Keith and Glover, in their book titled *Primary Language Learning with Microcomputers (1987),* point out a number of advantages that word processing brings to learners and teachers. These will be presented here as points. However you are expected to discuss these fully in the face-to-face discussions you will be having with your facilitators.

For learners, the word processor:

- Enhances their perceptions of themselves as "real" writers

- Gives their text a better public image,

- Brings their writing closer to public forms of communication and adult models.

- Gives them a new perspective on spelling and punctuation errors

- Enables them to reflect on the thinking that goes on behind the writing,

- Makes it easier for them to share their work with others

- Encourages and facilities collaborative writing,

- Gives them control over the pace and direction of their own learning

- Help them adopt an appropriately self-critical distance from their writing

- Encourage experimentation and risk taking,

- Provide a focus for group discussion.

For Teachers, the word processor:

- Permits them to spend more time on individual supervision and tutoring

- Directs and controls the work of small groups,

- Gives them a store of information on children's writing and thinking,

- Makes compositions easier to read.

Given that the word processor has a great potential for making improvements in writing, how can this be incorporated into teaching? Let's examine a sample of teaching activities.

1. Student Editing

One technique for working with word processors in classroom instruction involves making students editing and correct other student' work – anonymously. To accomplish this technique, you first give students an assignment to write something on the word processor, asking them to save their draft in a file with a word or number that you provide.

For the next activity, each student edits another student's file. You as teacher made the assignment, but the editor is unaware of the author's identity. You give the student the rules for editing and teach them how to include comments in a writer's file by marking the comments with a series of asterisks. The editor saves the edited file on the same disk with the original file for return to the author.

In a follow-up activity, the author looks at the original document and at the comments and makes a second draft of the work. Repeating the editing and response exercise can lead to better and better draft of an individual's written work.

2. Collaborative Projects

Cooperation at the keyboard can also be extended to the writing process. For example, a teacher can have students pursue a team approach, using word processing, to the writing of assignments or the development of oral presentations. The word processor's ability to segment and/or merge portions of a document in various fashions facilitates such joint development processes.

If you are teaching social studies, for instance, you might ask teams of students to cooperate to develop a position paper on a controversial topic, to be used as the basis of a class debate. Each student team develops a first draft of their position based on text and reference study, subjects their draft version to joint and/or individual scrutiny, and then devises a revision procedure and final product.

3. Writing Frameworks

The word processor can be used in any situation where there is a standard format or structure underlying a writing endeavor. For example, you could use it in a science class to help teach students how to write laboratory reports for their experiments. With the program, you produce a

framework for this task by storing a model report in one file and a blank model form in a second. The student reads the model report to view an example of the type of report you would expect to receive. The blank model form provides the headings and format, but is empty and ready for the student's own work. The student would be able to enter information, but also to refer to the sample report at any time. The student worlds save the developing report on a word processing file, so that the blank form could still be available for additional lab reports. The third file would be the location of the student's reports in progress, and as such would be always available for easy reading by you and/or rewriting by the student.

4. Individualized Checks

Some word processing programs incorporate a spelling checker and a thesaurus. These support tools offer additional instructional opportunity to any teacher interested in enhancing students' vocabulary and spelling skills. Students who write on the word processor can use the spelling checker to highlight (and correct) their misspelled words. This function also provides a means for teachers to create customized spelling lists for students. To do this, you would have the student on the word processor use the copy function to transfer the words identified into another file. The student would then be able to use that file as a personal spelling list for study. The electronic thesaurus allows the students to examine synonyms for words they are using in reports, and to choose more varied language.

Summary

Dear student, this session has taken you through some of the ways in which Microsoft word can be used to improve your students language and also perform reading and writing activities or do projects and assignments in all subject areas. It is hoped that you will try these with your students.

SESSION 2: USING SPREADSHEETS AND DATABASES IN TEACHING

Objectives

1. Identify the main features of spreadsheets and databases.

2. Describe the ways in which teachers can use spreadsheets and databases in teaching.

3. Describe the ways in which learners can use spreadsheets and databases in learning.

4. Explain the benefits of using spreadsheets and databases in teaching and learning.

Introduction

Just as a word processing programme creates an electronic blank page upon which one can write and make changes in text, a spreadsheet is an electronic blank page upon which one can manipulate numerical quantities. In the world of business, accountants and bookkeepers have taken to spreadsheet programs to make their work easier in the same way that managers and

secretaries as well as novelists, poets, and journalists, have adopted word processors. In this session, we will look at the way information is constructed in this application software and then go on to consider how educators might find this tool useful.

The Form of a Spreadsheet

A spreadsheet is a framework into which you can place words, numbers, and formulas. What appears on the screen at the beginning of a spreadsheet program is nothing more than a set of numbered rows and alphabetized columns. The user can identify it with, for example, a work sheet name and date. The intersection of each row and column is called a cell. Each cell has a unique name (such as C4). It is into these cells that a user puts information to produce a particular work sheet. Now, since words and numbers are used in it, let us briefly consider how this is done.

Words are used to label column and rows and to name or describe specific portions of the spreadsheet. (It is expected that your facilitator will illustrate this for you for the benefit of those who are not familiar with it). Numbers used may be in the form of integers or decimals. These numbers can get there in one of two ways. First, a user can type the number into an appropriate cell. Second, the user can enter a formula to calculate a number (such as a sum) and the result of the calculation will appear in the cell.

Apart from words and numbers the next important feature in the spreadsheet is calculations. Any given cell on a work sheet may contain a calculation formula that produces a number value. The calculation formula is a mathematical statement of how the computer is to manipulate some other aspect of the spreadsheet to produce a number for the cell. For example, some typical calculation requests for an imaginary spreadsheet might be: (1) add all the numbers in column G, (2) average the numbers in row 4, (3) find the highest number in column J, and (4) multiply column C times column D, divide by 100, and put the result into column K. Therefore a spreadsheet can sum and average the numbers in the various columns. It can also find the difference between two columns for each row, among other things.

These are simple technical features of the spreadsheet, but they make it possible for us to use them a lot in teaching and learning. Let us now turn our attention to that.

Curricular Uses of Spreadsheets

Spreadsheets are by their nature very useful for many of the educational activities in science, mathematics, and business courses. Mathematics teachers in particular will be likely to involve students in studying the spreadsheet because it is now such an integral tool in making computations and representing mathematical information graphically. An elementary math class can use this tool to develop addition, subtraction, multiplication, and division tables. The high school trigonometry class can use it to generate angle function tables. The science class can use it develop a solution to an equation.

Please do not think that the usefulness of a spreadsheet is limited to such classes, however. Any class that looks at or uses numbers can make an interesting use of a spreadsheet program. For example, a home economics class might, while conducting an analysis of the local economy, use

spreadsheets for such comparisons food costs for four restaurants. The same home economics class can use spreadsheets to produce individualized dietary and nutrition plans for the students in the class. A social studies class may use the spreadsheet to record student survey data on a variety of current topics, generating a picture of totals, averages, and a progression of results over time. A government class could use it to analyze data from past elections. Wherever numbers are manipulated in a class, the spreadsheet has the potential to add interest and power. Now, let us take a look at a related computer application programme which works in a similar way as the spreadsheet but can do even more. It is called the data base programme.

Data base application programmes

Data base programs are designed to solve the problem of storing, organizing, accessing, relating, and changing large amounts of information. They are information processors. The simpler forms of data base programs act as file managers that catalog information. In their more sophisticated versions, the programs become the means for answering questions where the answers are based on the analysis of extensive banks of data.

Now, remember this. The heart of a data base is a set of electronic file cards of information. Each file card is one record, and each category of information on the card is one field. A set of records would be a data base file. It is more beneficial to have a file of records on a microcomputer instead of on paper. This is because a file, record, or field can be changed with ease, and additions and deletions readily made. More important, locating information within a data base is much simpler than searching for information in customary ways, since a computer can respond so quickly to request to find, sort, or select data. For example, when building a teaching unit, you can ask the computer to: "Find all the teaching objectives related to pronouns," and the computer will respond immediately with the information. Organizing information by records and fields provides opportunities to quickly view the same file of information in a many ways. Note that there are different types of data base programmes which can help you in different ways. You will be learning more about these in later courses. However we need to note here that students will need to create their own data bases. In doing so, decision must be made on questions such as:

(1) what information needs to be stored,

(2) how much information will be stored,

(3) what categories need to be created,

(4) how many records will be created,

(5) who will get access to what information, and so forth.

This is a creative aspect of the data base design and involves planning the structure of the data base even before any information is typed into it.

It is useful to state here some examples of data base programmes that teachers and students may find useful.

Teacher Use of Data Bases

Here is a sampling of data base files a teacher might be interested in having handy:

- students and parental information,

- books to the school library keyed to units regularly taught,

- test questions and answers related to topics taught.

- curricular objectives linked or keyed to learning materials,

- encyclopedic information related to a particular subject areas,

- in-service training programmes available,

- commercial sources of learning materials and books,

- community resources available for classroom teachers

Student Uses of Data Bases

- Elementary students can build computer files of the spelling words they have learned the definitions of the words, and synonyms for each word. As time progresses, each student would begin to have a personal vocabulary data base that could be used for the purposes of review. This approach could also be used with vocabulary from a school subject, such as science.

- Commercial data bases are available for classroom use in science, social studies and languages among others. These come with files already filled with information rather than being "empty shells" requiring the teacher or student to input information.

- Doing class data base projects. Using a database for a class project can be an ideal way for student learning. One such example of project-based learning using a data base is in social studies on the topic of surveys (Hannah, 1986). When doing a project the teacher would first need to direct student to decide what categories of data would be stored in a data base.

- Locating simple information in prepared databases.

- Developing problem solving and higher-order thinking skills.

- Developing original databases to maintain information of various kinds.

Summary

Spreadsheets are commonly seen by teachers who are even computer literate, as a tool for keeping official records and making calculations. In this session we have sought to explain that the features that allow those functions also do allow teachers to get students engage in calculations in mathematics and science lessons and to engage in healthy class discussions with such calculations. Database programs also allow students to have fun with generating their own

learning. It is hoped that you have been given some food for thought and will exploit the possibility of using these programs in your teaching.

Session 3: Teaching with Presentation Software

Objectives

1. Identify the main features of presentation software.

2. Describe the ways in which teachers can use presentation software in teaching.

3. Describe the ways in which learners can use presentation software in learning.

4. Explain the benefits of using presentation software in teaching and learning.

Introduction

The use of Presentation software for teaching and learning either by face-to-face, online interaction or multimedia delivery has been expanding consistently. This is because it is very powerful as a tool for organizing information for teaching and discussions. The increase in access to projectors of various kinds is making it use more common than uncommon. In this session we will discuss the use of presentation software, particularly Microsoft PowerPoint and how it can be used effectively in teaching and learning in our classrooms.

Presentation software is designed for producing and displaying computer text and images usually for presentation to a group. It is intended to replace the functions associated traditional media presentation tools such as the use of transparencies with overhead projectors. Like other computer based tools, it offers advantage over its traditional counterparts. Information is easily entered, edited and presented. There is no need to set up and fumble with traditional media equipment such as slides. With a presentation package it is easy to produce a very professional looking presentation complete with multimedia elements. Popular presentation packages include Microsoft PowerPoint, Adobe persuasion, Corel WordPerfect presentations etc. Now, let us first look at the useful features of presentation software because its uses and advantages result from the features it has. Therefore as we discuss each feature you need to reflect on how it could possibly be useful in lesson delivery, teacher-student interaction or student learning

Features of Presentation Software.

Slide format: Most presentation software packages are organized around the concept of a slide, analogous to a photographic slide. Individual slides may have a number of different elements including text, graphics, bullets for emphasis and multimedia elements. Once you have created individual slides, you can arrange the set to create your presentation or slide show.

Slide templates: Slide templates are usually provided to simplify the process of creating slides. These templates have preselected formatting, fonts, text styles, special effects and so on. You

simply select the desired template and enter the information and the programme automatically applies the templates formatting.

Slide special effects: These are used to emphasize the points of your presentation. For instance, you may wish to add a bullet before each text item. In many cases bullets on texts can be animated or made to appear point by point. When going from one slide to another, presentation packages allow for any one of a number of special effects, including dissolving, wiping and fading.

Printing: Presentation packages usually allow you to create a printed copy of your slides, either full-size (one slide per page) or a reduced format with multiple slides printed on each page

Disk storage and retrieval: Of course, like other computer tools presentation software allows information to be stored on, or retrieved from disk.

Text entry and editing: Because text is usually an integral element of most presentations, presentation packages provide basic text entry and editing features, including a variety of fonts and type styles. Basic word processor-like functionality is provided. Some packages provide a "chalk" function that allows you to use the mouse to write on a slide during a presentation like chalk on a chalkboard.

Graphics: Graphics, too, are an important part of most presentations. Typical packages provide a basic set of drawing or printing tools. Chart and graph production capabilities are common. Clip art is often provided. In addition, most presentation packages permit you to import graphics created in other packages.

Multimedia elements: Most presentation packages support multimedia elements These may include digital audio, digitalized video, hyper media links and control of external devices such as pen drives. With full multimedia capabilities, multimedia packages now include the function of slide projectors, overhead projectors, tape recorders, and VCRs all rolled in one.

Internet compatibility: The newest trend in presentation packages is compatibility with the internet and the World Wide Web. You can embed links to websites in your presentation. In addition, some applications let you save your presentations on hypertext markup language (HTML), the language of the web which permits them to be placed on a website for viewing online.

Now that we have presented the main features of presentation software, let us now use these to discuss how they can be helpful in teaching and learning. It is expected that you will describe the uses we identify here and others you can identify yourself in more detail at your face-to-face meetings. This will enable you to use them better. We will discuss the uses from the perspectives of teachers and students.

Teacher uses of presentation software

- Supporting lectures or other presentations to groups in the classroom

- Making presentations to school boards, at professional meetings, or in other non-school settings.

- Displaying information at events such as parent open day. Most presentation packages support timed or auto run features that allow slide shows to run unattended whilst speaking.

- Recording the results of brainstorming or other teaching discussion activities in the classroom.

- Preparing notes, pictures, or other material that can be printed, transferred to photographic slides, or converted for placement on the web.

Student uses of presentation software

- Making in-class presentations or reports.

- Preparing textual information, pictures, or other material that can be printed, transferred to photographic slides, or converted for placement on the web.

Problems and pitfalls

As with graphics and other computer tools in school, a major risk in the use of presentation software is that students (and teachers) may emphasize form over substance. Presentation packages, especially when using prepared templates, can make almost any content look good. Unfortunately, the content itself may be awful. It is important that students realize that good content must come first. One way to emphasize this point is to require your student to first construct presentations using a blank template or in outline mode to discourage them from focusing on the flashy elements of the package; graphical templates , colors, pictures, animations, and so on. After creating the content, students then can focus on adding visual` appeal. Caution students to avoid overdoing available effects when adding visual elements. Good design principles still apply.

Presentation software can greatly enhance the interest and visuals appeal of lectures and other presentations. But, teachers who discover presentation software sometimes fall into the trap of wanting to turn everything into a presentation. It's easy and attractive, but the result can be too much of a good thing, with lots of nice-looking lectures, but all lectures nonetheless. There are many methods and media for helping learners to learn. It is best to take variety of approaches when trying to reach different learners and help them stay actively involved

Now, let us remember that in the uses of presentation software the major element used in text. This means that the proper use of text makes the use of presentation software more effective. We will be discussing the use of text in more detail in session 1 of unit 2. However we need to identify some specific qualities that text used in presentation software should have in order to make the information more learner friendly. These include:

- Leanness: Not too much information.

- Transitions: Coherence is important.

- Clarity: In language use and in use of visuals.

- Reading level: Learners level must be your focus.

- Mechanics: Use of correct grammar, spelling and punctuation.

These factors must always be considered as we prepare information to teach using Microsoft PowerPoint.

Summary

In this session we have explained a number of issues on the use of presentation software. We have mentioned the fact that such software has been designed specifically to promote the orderly presentation of information in such a way as to improve understanding and interaction. We have described the features of the software and how it can be used by both teachers and students in promoting teaching and learning. It is hoped that you will be motivated to use this software with your students.

Session 4: Using computers for other teaching and learning objectives

Objectives

1. Identify the features in computers that make other teaching objectives possible.

2. Describe the ways in which teachers can use computers for other instructional objectives.

3. Describe the ways in which learners can use specialized application programmes for learning objectives.

4. Explain the benefits of using specialized application programmes in teaching and learning.

Introduction

In this unit we have so far discussed the use of application software for the direct teaching classroom lessons. However, there are other uses to which such programmes can be put, either by students or teachers in support of learning. Some of them involves applications that can be installed on the computer for special school purposes. It is these uses that we will discuss in this session.

The first kind of computer based program that can be used for a teaching and learning purpose is what is called a *text analysis program*. Such programs have the capability of analyzing grammar and providing automatic advice on sentence, paragraph, and composition construction. If such a program were used regularly as a grammar checker in your classroom, you could be informed about selected aspects of students' writing, such as the number of words produced, the reading level, and the average word length, sentence length, and paragraph length. Also you would be better able to do less marking and assume a more facilitative role in guiding students' writing efforts.

Also, another program is the *electronic outliner*. This can help a student to organize the content of a paper. The outliner program allows the student to place ideas in an outline form easily, with

the outliner doing the format work and the student the thinking. After creating an outline, a student may add or delete ideas, and the outline will reconfigure itself to contain the new ideas.

Another useful tool program is the *writer's usage manual* which is available as a pop-up program. If a student is working in a word processor, he or she can pose a question which will be answered on a section of the screen in the form of a menu of choices that leads to explanations and definitions of proper usage. For example, if a student is writing about the Pope, but does not know the appropriate title for this office, the student can call for the usage manual and look it up. An even more sophisticated support to be word processor is a *writer's reference library* which is available online.

Another utility programme supports the production of school Newsletters and Desktop Publishing. Although students are normally recipients of information, the notion of having students organize and disseminate information is one that needs to be encouraged. One special type of word processor can be used to great advantage in such an activity. A "newsletter program" (or *desktop publisher*) can help students produce a newsletter, complete with pictures and print in columns. The program facilitates the typing of columns of information and the production of various sizes and styles of headlines. Just as important, it makes the incorporation of graphics into print exceedingly simple. The result is an almost professionally printed document – all "published" on the desk top. Now, in the classroom, students can publish newsletters in diverse forms and for various purposes. For example, an elementary class can create a "science project news" or "mathematics monthly" newsletter, describing to parents the important activities being accomplished or topics being studied.

Okay dear learner, you are expected to look for these programs on your computer are see if you can try out their use. Now let us turn attention to another aspect of the way in which computers strengthen learning.

Schools place great emphasis on students acquiring knowledge, but very little on teaching students how to produce new knowledge or to organize existing knowledge into new patterns. Applications programs open up opportunities for teaching in some areas that are typically not well developed by teachers. Some of these areas are:

1. **Cognitive Strategies**

Cognitive strategies are the skills that a student uses to govern his or her own learning, remembering, and thinking behaviors. The word processor, spreadsheet, and data base applications programs are all tools with which teachers can begin to use to help students improve their ability to think and organize their own learning. Knowing how to do a spreadsheet is only the start of a learning endeavor. Since a spreadsheet is initially information free, it is a playground upon which any set of numbers can be manipulated. In order to use a spreadsheet for a given problem, a student must figure out how to structure it in order to produce a specific outcome. This becomes an important experience for the development of cognitive strategies.

2. Verbal Information

Although the word processor allows the almost unlimited manipulation of words, it probably is not the most powerful application in regards to verbal information. The data base program seems to hold the most potential in this area. Designing a data base requires a student to organize verbal information. For instance, in creating a data base of information on plants, an elementary student must make decisions concerning what to store, how much verbal information to store, where to locate the information, and the relative importance of various kinds of information. This type of activity is far different from having the student memorize the names of things concerning plants.

3. Intellectual Skills

The use of a data base program requires a high degree of skills in the area of concept learning. The data base program is organized around concepts used to represent specific groupings of words and numbers. Opportunities for new concept learning abound as students manipulate information and identify it by category labels. The spreadsheet also is an example of rule-using learning and the application of rules, since all the numerical quantities of the spreadsheet are interrelated via various calculation rules. Both the spreadsheet and the data base program present ample opportunities for building of higher level intellectual skills through problem-solving endeavors.

Specialized Utility Applications

Although our emphasis in this session has been on the use of application programs, there are some additional information free programs that can serve as valuable classroom tools in certain curricular areas. These programmes are tools that enable you do additional things in support of learning. They include graphics programs, musical programmes and graphical programmes.

1. Graphics Programs

These are used in the processing of pictorial information. These are often used by architects, drafters, engineers, and artists. Though many of them would not have widespread applicability in schools, programs of lessor sophistication are available to permit student at various levels to produce and process images similarly. For instance with the aid of an appropriate application program, a student can produce some simple shape and then quickly transform it into an intricate pattern or design. The computer can shade, color, enlarge, shrink, multiply rotate, or reverse the image at the direction of the student. These programs facilitate drawing, painting works or art, and the design of items of utility. Other programs combine artistic composition and text, allowing students to produce and illustrate their own works of literature.

2. Musical Composition Programs

Professional musicians are turning more and more to the computer to aid aspects of the creative endeavors. There are a number of computer programs that allow students to develop musical compositions and to exercise their creativity in this area as well. Available musical programs range from the printing of the music played by children through music transposition and arrangement. Music from an electronic keyboard can be fed directly into a computer and modified in various creative ways.

3. Graphing Programs

We have mentioned that spreadsheet often offers a graphing capability. There are application programs that specialize in this feature. These graphing programs are particularly useful when there is a need to compare and interpret information, whether it is provided by the user, such as in a mathematics, social studies, or science classes. After a sufficient amount of data had been entered by the students, such a program can be used to graphically illustrate the information.

Summary

Session we have looked at the use of computer programs not for direct teaching, but in supporting learning in an important way. We have discussed the use of programs for text analysis, outlining, and doing desk top publishing. We have also looked at some special learner skills that are developed in teaching with ICT such as cognitive strategies and intellectual skills. Finally we looked at the use of special application programs for learning such as graphing and musical programs. We hope you enjoyed the session and will endeavor to make yourself more familiar with these programs.

UNIT 4:   INTRODUCTION TO MULTIMEDIA USE

UNIT INTRODUCTION

Multimedia is any combination of text, graphics, sound, animation and video delivered by computer or other electronic or digitally manipulated means. When you weave these elements together you get a rich sensation of information which can electrify the minds of your learners. This unit will introduce you to the knowledge and skills in using multimedia elements including text, graphics, video, sound and colour in teaching and learning with ICT. You will learn how to format, select and use these elements in teaching your lessons in the classroom. You will be taken through the following sessions in this unit :

Session 1: Using text in teaching

Session 2: Using graphics in teaching

Session 3: Using Video in teaching

Session 4: Using sound and colour in teaching

Session 1: Using text in teaching

Objectives

1. Identify the features on text programs that can be exploited for teaching and learning.

2. Describe the text format considerations to follow in designing information for learning.

3. Explain the factors to consider in the quality of text for teaching and learning.

4. Discuss the various ways in which text is important in teaching and learning.

Introduction

Text is the most common form of information in almost all interactive multimedia programs intended for learning. In most classroom uses of computers that we have discussed in the previous unit, text can be seen as the most dominant, whether in word processing, spreadsheet or database programs. This means that we need to see text itself as a useful tool for teaching and learning. In this session we will discuss the considerations and recommendations for the proper design of text for teaching in the classroom and for all multimedia teaching purposes.

We will begin the discussion by looking at text layout and formatting. Because text is a major component of most teaching and learning programs, its proper design is essential. If there is a particular sequence in which text information should be read, follow the general convention of sequencing from the top to the button and left to the right because users are used to reading in that way. Sentences and paragraphs should be formatted. This means that lines should not end in the middle of words, and that paragraphs should not begin on the last line of the display or end

on the first line of the next display. Consistent use of indentation or blank lines to indicate new paragraphs should be used. Text should not be squeezed into half of the play, leaving the rest almost empty. These are the same consideration that should be used for text paper, but authors of computer programs often do not show the same concern for well-formatted text.

Spacing between lines effects text readability. Most modern software allows control over the spaces between successive lines. When available, it should be adjusted to make text readable and attractive. Built-in text fonts generally adjust line spacing according to the text font and size, making it attractive and easy to read.

The Relationship between text and graphic information is important. When a combination of text and graphics appear on a display, it is useful to enclose the text in a box. Many other ways of emphasizing parts of text are available. Underlining and alternative typefaces are common methods, but not particularly effectively. Because underlined and colored text are now commonly used to indicate hypertext (text that when clicked branches users to news location), using these techniques for emphasis should be avoided. Otherwise, users may be misled into thinking that this text can be clicked for navigation. Text that is uppercase is also difficult to read. Most effective methods of emphasis are boxes, arrows, larger letters, and isolation. Remember that any emphasis technique should be used in moderation or it will cease to be effective.

The most difficult design issue regarding text is the use of scrolling, which has become common in hypermedia programs and web page. Scrolling occurs when all the information cannot fit on the content portion of the screen at one time. To view all the information, the user has to scroll up or down to see it, causing other information to disappear from the screen. Both text and graphical information may scroll. Usually a scroll bar or other controls allow the user to move up and down at will. The alternative to scrolling is paging, going forward or backward an entire page (screen) at a time, as in a book. Paging allows each page to be well designed, with the position of text and illustrations nicely coordinated. Paging is more natural and comfortable to most people

Another text format consideration, driven mainly by the web is user modification of text characteristics. The author can decide the size, font, color and other characteristics of text. On most web pages those text characteristics may all be modified by any user via a preferences panel of the web browser. User modifiability has some advantages. It is useful for persons with visual disabilities. It allows accommodation for different size computer screens. On the other hand, it increases the difficulty for designers to plan the placement of text, graphics, and related screen elements.

Text Quality

Now, let us move a step further on the use of text, to look at some factors in the quality of text that are essential in making it effective in teaching and learning. This is especially relevant for situations where you are using multimedia programmes but are still useful when teachers are producing their own textual information for learners. The following are important factors in the quality of text.

- Leanness

- Transitions

- Clarity

- Reading level

- Mechanics

Leanness is an important quality of text often recommended for programs intended for learning. It means a program should say just enough to explain what is desired, and no more. This applies not only to text descriptions, but to examples of concepts, sample applications of rules, pictures for demonstrations purposes, and so on. Readers learn the main points of a textbook better from summary of the main points than from the text itself. This was true even when the main points in the textbook were underlined. Therefore on computers, using too many words and crowding information is not useful. Actually learners obviously require less time to study a more succinct program. Although lean presentations have benefits, the amount of detail must vary considerably for different instructional purposes and methodologies.

Transitions from one topic to another are essential because maintaining a clear flow of ideas in a multimedia program is more difficult than in a textbook. Limited display capacity requires changing pages more frequently. It is difficult for a learner to distinguish a change in display that represents a continuation of a current topic from one that represents changing to an entirely different topic- the equivalent of changing chapters in a book. A good program uses clear transition statements such as "Now that you know what glaciers are, we discuss the way in which they are formed." Similarly, reading is facilitated if a program distinguishes whether a keypress or mouse click causes a continuation of a topic or a change of topic. Contrast two directions. The first is vague whereas the second one provides both *functional* and *cognitive* direction.

Clarity of text is facilitated by avoiding ambiguous language and by having consistent use of terminology. Ambiguity occurs frequently in technical areas, which specific technical terms have come into everyday usage with less specific meanings. Pointing out that such terms are being used in their technical sense specific meanings. Pointing out that such terms are being used in the technical sense may be necessary so learners do not assume the common usage. Ambiguity is also caused by using pronouns with unclear referents. consider the following directions from a chemistry laboratory. 'The liquid is then poured into a beaker.' It is not clear whether the liquid is heated before being poured into the beaker, or if the beaker is supposed to be heated before the liquid is poured into it, or if heating takes after pouring.

Using *consistent terminology* means two things. First, more than one word should not refer to the same thing, such as sometimes using beaker and other times container. The reader may ascribe significance to the subtle difference between the two. Second, the same word should not be used at different times to mean different things, which also produces.

The *reading level* of a program must be suited to the learners who use it. It common to find programs for students learning beginning arithmetic, being used by children in the first grade, with the directions and questions at the third-grade level. You need to determine the approximate reading level of a program or segments of it. Piloting with real learners is a reliable method of ensuring the correct level of text.

Mechanics is a characteristic of text quality that should be considered. It refers to the use of correct grammar, spelling and punctuation. Unlike clarity, standards for mechanics have been established, and it remains only for writers to follow them. When a program has poor mechanics, learners view the author of the program with less credibility and do not take the instruction as seriously. They may also learn poor mechanics themselves.

Summary

Text is the most used medium in ICT and in teaching with computers. This session has exposed you to the features of text which makes it so useful such as easy modification, scrolling, formatting and combining with graphic. It has also exposed you to format considerations, factors to consider about text quality such as leanness, transitions, clarity and mechanics. It is believed that you will obviously take a critical note of all issues in this session as you are a computer user and do use text. Please study the session closely.

Session 2: Using graphics in teaching

Objectives

1. Describe the types of graphics that are used in teaching and learning.

2. Identify the ways in which graphics are used in teaching.

3. Describe the varieties of graphics that can be selected for use in teaching.

4. Explain the benefits of using graphics in teaching.

Introduction

This session provides an important beginning in describing how graphics are used in instruction. First, this chapter will describe an overview of the groups or types of graphics typically used in instruction. These groups are fundamental to understanding the concepts in the remaining chapter. The decision to use graphics and how they will be used in teaching with computers starts with defining the goal of the lesson and the nature of the learning tasks and materials. For this reason, the second part of this session will look at the kind of learning that can be enhanced by teaching with graphics.

The Types of Instructional Graphics

Given the popularity and flexibility of graphics in instruction, a way is needed to make sense of how they can be used to improve instructional materials. First, there is a need to describe the types of graphics commonly used in instruction. Second, there is a need to describe the various functions of each type when applied in an instruction. We will use a simple classification system that describes the types of visuals commonly used in instruction. The three types of graphics commonly used are classified as representational, analogical and arbitrary (Alesandrini, 1984).

Representational Graphics

Representational graphics are those that share a physical resemblance with the object they are supposed to represent. For example, a passage of text explaining the structure of birds would be accompanied by a picture of a bird or birds. Representational visuals range somewhere between highly realistic to abstract. The most common examples of realistic representational visuals are photographs or richly detailed colored drawings.

Analogical Graphics

Analogical graphics show something else and imply a similarity. It is crucial that the learner understand the analogy. For example in instruction on the feature of airplanes that make them fly, a swan, which is a bird, may be used as an analogical graphic. Analogical Graphics are probably the most common type of illustration used in instructional materials today, including computer environments. However, presenting students with an accurate representation of something may not always be the best learning tool. One such example is when students have absolutely no prior knowledge of the concept. Instructional research indicates that analogies may be effective instructional strategies in such instances (Curtis & Reigeluth , 1984; Halpern, Hansen, & Reifer, 1990). For example, if students do not understand the idea that a submarine is able to dive under water, it might be more appropriate to first suggest that a submarine is analogous to a fish so students understand this characteristic. However, a better analogy would be a whale, because of its size. Of course, a submarine is not a whale, so learners must understand that the analogy is being used only to represent similarities. Differences do not exist, and it is important that students understand the analogy's limit.

Educational psychologists often describe learning as a process that goes from the known to the unknown. An analogy can act as a familiar "building block" on which a new concept is constructed. Of course, if the student does not understand the content of the analogy, then its use is meaningless and confusing. The usefulness of the analogy, therefore, is largely dependent on the learner's prior knowledge.

Arbitrary Graphics

Arbitrary graphics offer visual clues. They share no physical similarity with the things they represent, but illustrate logical or conceptual relationships using a variety of visual and spatial means. An example of an abstract representational visual is a line drawing. These also range in quality from richly detailed to rudimentary drawings. Such drawings usually lack interesting details and background which makes it easier to focus on the essential characteristics of an object. For instance a line drawing of a bird can be made for instruction which will not have any other detail. Simple line drawings are often considered better learning aids than realistic visuals, especially when the lesson is externally paced, such as in films and video. (Dwyer, 1978).

Arbitrary graphics have spatial characteristics that convey meaning. Examples range from the use spatial orientation of text, such as outlines, to flowcharts, bar charts, and line graphs.

Charts and graphs are probably the most common types of arbitrary graphics. Charts refer to tables or information contained in table-like formats. The purpose of a chart is to organize and display information by one or more categories or fields. All of the information in a chart is discrete (categorical) data. A "cognitive map" is an interesting example of a chart that has much

support from research as a learning tool. Cognitive maps are part of instructional techniques called spatial mapping. The purpose of cognitive maps is to show graphically the relationships and hierarchies of related ideas and concepts.

Dear learner, you may take a break now to ponder over what you have read concerning graphics. It is all so interesting that you may be carried away by the lots of graphics you have seen on computers. You may be wondering which of these three types of graphics they represent. After doing this you may now proceed to our next discussion which is on the instructional application of graphics.

Five Instructional Applications of Graphics

The main reason why graphics are seen as the most powerful learning tool is because graphics stick in our minds more than text. We remember better and for a longer time things we see. You will learn more about this in your teaching methods, but, for now we will spend time to discuss the instructional applications of graphics. We will look at an informal guide to the way graphics can be used in instruction: cosmetic, motivation, attention-gaining, presentation, and practice. Their purpose is to describe instructional situation in which all three graphic types can be applied. Three of the application- attention-gaining, presentation and practice – serve cognitive functions and two of the applications – cosmetic and motivation- serve affective functions. These functional categories should help you to design and choose instructional graphics for instruction based on whether the intent of a graphic is to contribute to learning or to the effective appeal of a lesson. Teachers should ask themselves this all – important question each time they begin to use graphics in teaching. "What function is my graphic going to serve in this lesson?"

Affective functions

The purpose of cosmetic graphics and motivational graphics is to enhance the effective appeal of a lesson. Affective applications are designed to improve a student's attitude toward learning or to increase the incentive of a student to participate in the lesson. *Cosmetic Graphics* are often used for purely cosmetic reasons. In a sense, it is seems wrong to call this an instructional function, because, by definition, no direct learning benefits are expected from cosmetic graphics. The purpose of a cosmetic graphic is to merely add to the polish or decoration of the instruction. To make a program more attractive or aesthetically pleasing. A few common cosmetic graphics are fancy screen borders, some uses of color, and the use of special effects like animations. Cosmetic graphics often add a certain level of completeness or sophistication to a package. This may promote the feeling among students that the instruction is important, whether or not this is true.

At their best, cosmetic graphics help maintain student interest and perhaps regain student attention and would heavily overlap the attention – gaining and motivational functions described next. At their worst, cosmetic graphics distract student attention from other important material. Unfortunately, students may get the impression that the graphic is directly relevant to the text and thereby might spend time looking for learning clues in a cosmetic graphic. When this happens, the graphic poses the risk of distracting the student from the intended lesson goals.

Motivational Graphics are often incorporated into instruction to raise the general motivational level of a lesson. Much of the motivating appeal of graphics is due to novelty. They present something new. Unfortunately, novelty effects are temporary, gradually disappearing over time.

Using graphics to arouse general curiosity and interest is seen by many as a very superficial way to increase motivation. There are deeper ways to maintain attention and interest beyond the simple provision of interesting graphics. For example, if the nature of the learning task is satisfying, relevant, and challenging, students are more likely to participate meaningfully. Hence, students' time on-task is not only increased, but the quality of this learning time is enhanced as well.

Cognition Functions

Graphics that serve cognitive functions are designed to directly enhance the ability of students to learn from instructional materials. These graphics should be designed to achieve or help achieve, one or more of the events of instruction. *Attention-Gaining Graphics* are used for good reason. There are many sources of stimuli that compete for a person's attention in and out of the classroom. Many, if not most of these sources are probably far more interesting than the instruction itself. Usually, these competing stimuli come from the student's environment, such as a buzzing light, screeching chairs, music or laughter from down the hallway and an attractive member of the opposite sex sitting in the next row. Competing stimuli also can come from within the student's own mind, such as personal concerns like a home crisis or just general daydreaming. For these reasons and many more, attention-gaining is an important initial event of instruction (Gagne, 1985). Attention-gaining applications are obvious, practical, and rational uses of graphics. The purpose of the animation in applications or graphics that purposely serve to gain attention should not subsequently distract attention from other important and salient lesson features. Remember that there is a big difference between using a graphic to capture the attention of someone versus using that graphic to teach something. This is just one of many examples of the 'form follows function' principle, where the type and design of a graphic must be determined by the function that the graphic is supposed to serve.

Presentation Graphics are frequently used to teach. Graphics can be used with or without accompanying text to demonstrate or elaborate a lesson concept rule, or procedure. The processing partnership between visual and verbal (textual) information is the foundation of several theories of long-term memory. The use of static and animated graphics as a presentation device has been called a 'learning-by-viewing approach' to instructional graphics. Most instructional applications use representational graphics to directly visually depict critical information and are probably the most common way pictures are used to help students learn from text. Animated graphics for instance can be used to demonstrate an application of the laws of motion. Animated presentations can also aid a student's conceptual and understanding of interrelated lesson variables. In this way, presentation graphics help students to interpret difficult-to-understand information such as the actions of volcanoes. Children, or other novices, would be expected to benefit from these kinds of animated displays, since they probably would have difficulty in visualizing abstract relationships on their own.

Presentation graphics are an effective presentation strategy when combined with text. The graphics help learners focus their attention on the explanative information in the text (Mayer, 1989). Representational Graphics help learners to understand information better if some conditions are satisfied. For instance the text it is supposed to support must be understandable by students. Also, the visuals or graphics used must be at the level of the learners understanding.

Finally, presentation graphic can also be used to help learners to organize their thinking. They can be used to help make relationships between ideas more apparent or clear. The most common examples of these are 'how-to-do-it' graphics that show a set of step-by-step procedures in visual form. Examples include how to assemble a household device or how to perform an emergency medical procedure. Such procedural application of graphics are very relevant for many psychomotor tasks.

Modern teaching with computers, or multimedia programs make extensive use of pictures, illustrations, graphs, and animations. Some may not be well designed or well used. When properly used, pictorial information enhances learning. However, if used improperly, it can be detrimental. In learning, learners generally focus attention on the important information in a program rather than incidental information. Pictures, graphic presentations should be designed for more important information.

In designing and using graphics, the teacher should consider both the purpose of the graphic information and the type of graphic. Graphics may be used in programs in many ways. Four primary uses of graphics for teaching are;

- As the primary information

- As analogies or mnemonics

- As organizers: such as maps, timelines, flowcharts and organizational charts.

- As cues

It is also important to note that there is wide variety of types of graphic information. The main ones in interactive multimedia are,

- Simple line drawings

- Schematics

- Artistic drawings

- Diagram

- [Photographs

- Three-dimensional images

- Animated images

You need to be able to identify these types and are expected to discuss these further in your face-to-face meetings. You need to be able to use each of these effectively. Therefore we will briefly look at some recommendations about the proper use of graphics.

1. Select and use graphic information that is relevant for your instructional message.

2. Avoid excessive detail. Details can overload memory and confuse the learner, who will not know what to focus on. Simple line drawings may demonstrate a point more clearly than realistic pictures.

3. Consider breaking complex illustrations down into simpler ones. One way to do so is to produce part of a graphic, allowing the learner to inspect or read about it first, and then to overlay new parts or details, gradually building up a large or complex image.

4. Present pictures and related information simultaneously, so the learner can inspect the illustration and the explanation together. If possible, explain pictures with speech rather than text.

Summary

Visuals are the most powerful tool in learning and a good reason why ICT has received so much interest in teaching. This session discussed how you will make the best use of graphics in your teaching. The session covered the types of graphics including representational, analogical and arbitrary graphics. We also looked at the affective and cognitive functions of using graphics in instruction as well as varieties of graphics we could use. We believe you enjoyed this session and will read it over several times as you use graphics in teaching your students.

Session 3: Using Video in teaching

Objectives

1. Identify the forms in which video is presented in teaching.

2. Explain the benefits of using video in teaching.

3. Identify the challenges in using videos in teaching to make them effective.

4. Explain the recommendations for using videos in teaching.

Introduction

Multimedia helps to facilitate student learning by helping students to learn from the environment with graphics, pictures, real sounds and above all, through video which combines all the others. Learners remember better when two process are engaged such as visual and audio learning according to the theory of Dual -Coding. Therefore the entry of video in teaching has been highly welcomed by teachers. In this session we discuss the use of video in teaching and learning with the hope that you will also be excited and get involved in using it as is the case with most teachers. Enjoy the session.

Video is defined as the display of recorded pictures on a **television-type** screen. It is the recording, manipulating and displaying of moving images. There are a number of types of video medium including VHS (Video Home System), CD (Compact disc) and DVD (Digital video

disc). There are different forms in which we encounter videos in teaching with computers. These include the following:

- A soundless demonstration of a procedure.

- An unseen narrator describing a visual activity

- Comic and dramatic plays

- A person or people talking such as interview

- Very unrealistic animations are sometimes used when the real event cannot be captured e.g. inner working of the human eyes

The use of video has opened many opportunities for teaching with ICT. We can also list some of them for discussion in during the face-to face.

- Videos encourage people to evaluate their attitudes and thus are useful to effect attitude change.

- A narrator in a video explaining how to operate or do something is more effective than reading a text passage about it.

- Video can be engaging, entertaining, and thought provoking.

- It can lend a very professional look to a lesson

- A short video can replace long text passages.

- Video is a natural choice for some learning activities, such as spoken language or analyzing events in social studies.

- Information presented by video may be more memorable due to its detail and its emotional impact (Swan, 1996).

What we have just presented are some of the issues that make videos so valuable in teaching and learning. But there are also some issues that you need to be cautious about in using videos and we need to look at those too. They include the following:

- Creating video material is expensive and time consuming. Producing quality video with actors, sets, and professional cameramen can cost a lot.

- If you choose to use an already existing video, you need to be sure it fits your lesson otherwise a poor or unsuitable video can damage the lesson even more than the absence of video.

- Video also places great demands on the speed and display capabilities of hardware. Fast processors and high bandwidth internet connections are needed for video to look good. Special hardware must sometimes be installed for video to function at all.

- Like graphics, video attracts attention and can distract learners from more important information. For that reason, its use should be carefully considered. When video is used, it should be for emphasizing important information.

- If video is displayed simultaneously with text or other information, the overall display should be considered and evaluated to ensure that the components are meaningful together and laid out in a way that the learner can appropriately attend to them all.

Apart from these issues we need to take note of some more things to consider in using videos for teaching. It is good to be mindful of such issues to make our lessons with video achieve better objectives. Maybe though they ought to not be seen as rules, it is good to abide by them.

1. An important but difficult area in the use of video is the appropriate length of video segments. Although people can watch entertainment television for hours, the same is not true for instructional videos. The length of the video segment be limited to twenty to thirty seconds. This is necessary when the video presents instructional information, but many exceptions exist. It is reasonable for an interview to be longer, whereas watching a foreign language conversation may need to be shorter.

2. Also, a video presentation should always have its own controls. At the very least the learner should be able to pause, continue, replay from the start, and control volume. Less critical but sometimes useful controls are scanning forward and backward, necessary scanning and jumping directly to particular sections. The longer a video presentation, the more necessary scanning and jumping become. The following list summarizes some recommendations for the use of video:

    - Use it for important information.

    - Use video for demonstrating short information.

    - Consider the great expense of video production.

    - Keep video presentations short because attention spans are limited when watching visual content.

    - Provide user controls during video, including video controls and general program control

    - Must be aware of the costs and potential pitfalls of video. Creating a video is expensive and time consuming

    - If shortcuts are taken and poor video is produced, it can damage the professional look of a program more than the absence of video.

Summary

In this session we have discussed reasons why video has become a very important tool in teaching and which has been made possible by ICT. We have noted that your lessons will be

more interesting and your learners will be more active and enjoy learning if we choose and pick good video to use in teaching lessons. In doing so, we need to be careful. We should not use them simply for pleasure, rather than learning specific knowledge. We have to use Video for important information and keep video presentation short.

Session 4: Using sound and colour in teaching.

Objectives

1. Explain the advantages and challenges of using sound in teaching

2. Describe the proper ways of using sound in teaching.

3. Explain the advantages and challenges of using colour in teaching and learning.

4. Describe the proper ways of using colour in teaching.

Introduction

Sound and colour are two very useful teaching and learning tools that have made the use of computers very important in education. Sound appeals to the ears and colour appeals to the eye. These are two senses that together excite the brain to pay attention to incoming learning stimuli and also to remember what has been sensed for longer periods of time. It is for this reason that we are going to discuss sounds and colour in this session so that as teachers you will know how to use them with the best effect. Enjoy the session.

Sound is used as speech in presenting information. Sound is converted into digital signals of a computer through recording called digitization. Digital sound is easier to produced and more realistic than synthetic sound which a computer creates artificially. Some subject areas like foreign languages, music, beginning reading etc. are better taught using sound than other medium. You can discuss in your class why this is the case. Sound also helps in gaining attention even when the learner is distracted by other things. Sound is very useful in differentiating between certain speech elements we learn and especially in situations where the pronunciation of words spelt the same way are different.

It is important to note however that it is more expensive using sound in computer assisted instruction. If you are creating the sound, there is the need to record using good sound equipment, rehearse to get the best of sound, edit where necessary, all these make it expensive. It is possible however to get preexisting sound which suits the purpose of your lesson.

Sound, especially speech, is being increasingly important for teaching and learning. Like video, it has advantages and pitfalls. Let us first look at some advantages:

- Sound is necessary for some content areas (foreign languages, music, beginning reading).

- Sound is excellent for gaining attention, even when the learner is distracted and not even looking at the display.

- When a learner goes to a display where new or special directions are needed, using speech for *directions,* or just to tell the learner what to do is a useful technique. Text directions are often ignored.

- Furthermore, when textual content is displayed on the screen, speech is a useful way to distinguish *directional* verbal information (speech) from *content* verbal information (text).

- Speech is useful for non-readers, poor readers, young children, people who speak a different language, and for the visually impaired. For some users, it is best provided as a user-controlled option, for example, providing an optional audio track for visually impaired learners.

The challenges of using sound are similar to those of video. Please note that some of these challenges are simply cautions so that you will use it much better. They include the following:

- Audio production is not as expensive as video production (which generally includes audio) but is certainly more expensive than text production.

- Producing quality audio (devoid of background and microphone noise and tone or volume fluctuations) can be more difficult than producing the visual part of a video program.

- It is best to use professional speakers, to rehearse speech before recording, to use good recording equipment, to record in an area with good acoustics, to have consistent volume and tonal settings for all sound files, to edit and digitize well, and to evaluate carefully the quality of the final product.

- Like video, user control is essential. Once again, the user should have access to the usual controls of the program even when sound is playing, and should at a minimum be able to pause, continue, change the volume, and replay sound segments as much as desired before continuing. Scanning is not as useful with audio as with video, but being able to jump directly to sections during longer audio presentations can be useful.

- Presentations containing identical speech and text are common. This would seem to be beneficial as it gives the learner the choice of reading or listening, and might be especially useful for learners with visual or auditory impairment. But identical speech and text can be distracting and actually impair learning. It is better to provide controls that encourage learners to use *either* the text or audio presentation, not both at the same time.

- For good readers, listening to speech is slower than reading. Many people also have a personal preference (a learning style) for either reading or listening. Therefore, if your expected learners are adults and if a program contains extensive verbal information, the option to choose speech or text is much better than providing just one or the other.

You need to discuss all the information here during your face-to-face and you will enjoy them better. It is hoped that your facilitator will have actual content on the computer to show you as examples of this information. Following are summary suggestions for the prosper use of audio.

- Use speech for getting attention, for directions, and for dual coding.

- Provide speech for users who have difficulty reading text.

- Provide both text and speech as options.

- Use audio for appropriate content areas, such as language learning.

- Allow user control of audio (pause, continue, repeat, skip, and volume

- Allow the usual program global controls even during audio segments.

- Do not use token audio in just one or two places.

- All audio must be of high quality.

Dear learner, it is hoped that you enjoyed the discussion on sound. Let us now turn our attention to colour and see how we can use this other important tool to make our teaching and leaner more user friendly.

Colour

Colour is a powerful tool to use in teaching and learning with computers and in the multimedia presentation of information to the learner. Evidence shows that color enhance learning as it can be used to emphasize differences and attract attention (Pett & Wilson, 1996).

 The use of color is closely similar to that of graphics because they both use the visual sense and have that appeal. Although evidence demonstrates that color enhances learning and motivation, it does not seem to be as powerful as some other techniques, such as animation. Also, like graphics, color can be easily misused so as to be ineffective or even detrimental. Like most factors, the successful application of color is affected by individual differences as well.

Let us first consider some of the advantages of color;

- It is effective for attracting attention, though only when used in moderation. The attention-getting effect of color can and should be used, like that of graphics, to attract attention to *important* information. For example, a program may present corrective feedback in bright green. However, this technique can be easily overdone. It would probably be ineffective to design a program in which primary information is displayed in green, corrective feedback in yellow, directions in red, hints in blue, and section titles in orange. The learner may forget what each color represents and simply ignore them. In addition, the overall display would appear garish.

- Color may increase the information capacity of a display such as when used to emphasize differences. Imagine a graph with lines showing the effect of the economy on

the earnings of several businesses. With more than five lines it is difficult to distinguish one line from another. Using dotted, dashed, crossed, and other types of lines may simply increase the visual difficulty. Colors can make the lines easier to distinguish and associate with a legend.

- Colour may be used to emphasize differences.

- Colour may be used to get learners to focus on particularly important words or information or to highlight important points

Let us also consider some of the challenges or potential pitfalls of using color.

- Information may be lost on learners who have visual color deficiencies – about one person in fifteen.

- Similarly, color information may also be lost on some displays when printing. When possible, therefore, use color as a *redundant* cue. This means when using color to convey information, try to convey the information in a second fashion as well. If lines on a graph are drawn with different colors, also label them with text. However when the objective of the program relates to color, as in an art program such redundancy matters will damage the purpose. Such a case makes it difficult to convey the essential information in any way other than with color.

- When making color design decisions, one must strike a compromise between attitudes and learning. Most learners find a program in black and white "old fashioned" and dull, even if it communicates information effectively. Users generally prefer the colors red and blue, although they are poor choices for text and detailed pictures because colors at the extreme ends of the visible spectrum- the reds and blues- are perceptually difficult to process and should be avoided for text and detailed pictures. Some colors such as yellow and green, are easier to perceive than others.

- Furthermore, some color combinations (for background and text) are better than others. One should avoid red with green, red with blue, blue with yellow, and blue with green. More than four simultaneous colors should be avoided (Smith, 1987), especially for beginning learners.

- The use of color should be consistent with common usage in society. Do not use green to mean "stop" or red for "go", which could result in errors. Do not show financial graphs in which red indicates profits and black indicates losses. Our main suggestions are based primarily on learning effectives. You may need to temper them with considerations of learner affect.

After going through these cautions let us now make a summary of the important issues we have raised above regarding colour. We have noted the following:

- Use color for emphasis and for indicating differences.

- Ensure good contrast between foreground and background colors, especially for text.

- Use only a few colors for color coding.

- Allow learner control of color coding.

- Use colors in accordance with social conventions.

- Be consistent in the use of color.

- Balance learner affect and learning effectiveness when using color.

Summary

This session discussed the use of sound and colour in teaching with ICT. Sound is an audio input but colour is a visual input and their combined effect in teaching is great. We have therefore exposed you to the benefits of using sound such as in language and for reinforcing text and the benefits of using colour such as for attention and emphasis. We have also looked at the challenges in using both as well as the ways of using them effectively. We hope you have enjoyed the session.