Module for B.Ed Junior High School Education Programme

2nd Semester
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IoE/MoF/TUC/GHANA CARES TRAINING AND RETRAINING PROGRAMME FOR PRIVATE SCHOOL TEACHERS

Ministry of Finance

Trade Union Congress

Institute of Education, UCC

UNIT ONE

Introduction to Learning by Design

Objectives

By the end of the unit, students would be able to;

- discuss learning by design
- explain what is meant by teacher design teams
- state at least five principles in designing activities
- define interactive lectures
- state three ways used in evaluating the quality of design

Learning by Design

- It seeks to put teachers in similar roles as they work collaboratively.
- They focus on a problem of practice.
- Seek ways to use technology to address the problem.
- Their exploration about technology are tied to their attempts to solve educational problems.
- Being designers to technology not passive users.

Cont…

- The aim is for students to learn content deeply and at the same time develop the skills and understanding needed to undertake solution of complex, ill-structured problems.
- This is accomplished by having students learn in the context of trying to achieve design challenges.

Teacher Design Teams (TDT)

- Definition:

Teacher design teams can be defined as a group of individuals working collaboratively to design and develop ICT- based solutions to authentic pedagogical problem faced by teachers.

Cont…

- Teacher design team promotes:
  - Active learning
  - Local ownership
  - Collaboration
  - Sensitive

Usefulness

- Specific form of teacher collaboration in curriculum design
- Improve the teaching process

  Fruitful means for educational reform
- Building of cohesion in the staff
- Realising a better curricular product
- Teachers developing their own practice and enacting/using it within the school curriculum
- Teachers having a sense of ownership of product

Design of learning activities

- According to Thiagi, effective instruction has three components:
  1. Content
  2. Activities
  3. Feedback

Principles of designing learning activities

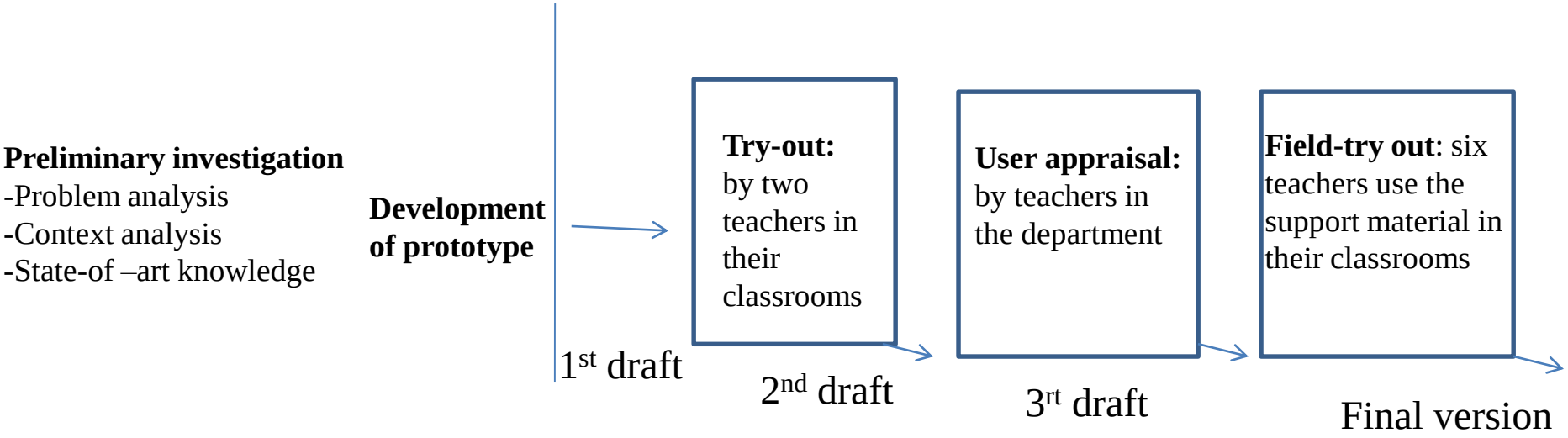
1) Integrate content and activity.
2) Design and implement activities.
3) Be guided by your target learning outcomes.
4) Engage in authentic learning.
5) Help participants build on prior knowledge and professional experience.

Interactive lectures

- It fosters active learning.
- The activities are designed to allow everyone to participate.
- For instructors, the activities provide feedback.

The process

-For the development of curriculum materials, teacher education programmes, interventions
-Cycle approach to design and formative evaluation



-Combination of preliminary study, expert review (validity), try-out and appraisal by users (practicality), and field-test (achievement)

Ways forward (1)

Teacher support materials,

- Showing ‘how to do it’
- By way of procedural specifications
- Focus on:

  -Lesson preparation (computer-based program)

  -Subject content

  -Lesson execution

  -Assessment of learning

Ways forward (2)

Professional development

- Preferably in combination with exemplary curriculum materials
- Should model the classroom situation, or
- Should be in the classroom

Criteria for evaluating the quality of the design (product/process)

- **Validity/legitimacy (ideal/formal)**
- **Practicality (consistency intended perceived/operational)**
- **Effectivity (consistency intended-experiential/attained)**

Instructional Design

Objectives

- By the end of this unit, students will be able to:
  - Define instructional design in their own words.
  - State ways in which instructional design assist educators.
  - Identify the basic steps of instructional design.
  - Identify the characteristics of instructional design.
  - Describe the ADDIE model.
  - Give details of other models {discussed in class).

Instructional design

- Instructional design can be defined as “the systematic process of translating principles of learning and instruction into plans for instructional materials and activities (Wulfrek and Ellis, 1983).

Cont…

- According to Albion et al., instructional design can be defined as a
  - process,
  - discipline,
  - science, or
  - reality

Instructional Design as a process

- It is the systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction.
- It is the entire process of analysis of learning needs and goals and the development of a delivery system to meet those needs.
- It includes development of instructional materials and activities and try-out and evaluation of all instruction and learner activities.

Instructional Design as a discipline

- Instructional design is that branch of knowledge concerned with research and theory about instructional strategies and the process for developing and implementing those strategies.

Instructional Design as a science

- Instructional design is the science of creating detailed specifications for the development, implementation, evaluation and maintenance of situations that facilitate the learning of both large and small units of subject matter at levels of complexity.

Instructional Design as a reality

- ID can start at any point in the design process. Often a glimmer of an idea is developed to give the core of an instruction situation.
- By the time the entire process is done the designer looks back and she or he checks so that all parts of the ‘science’ have been taken into account.
- Then the entire process is written up as if it occurred in a systematic fashion.

Steps in instructional design

- There are six basic steps in instructional design:
  - 1) Analyze your learners and the learning context.
  - 2) Define your learning outcomes (knowledge-attitudes-skills).
  - 3) Structure the learning content.
  - 4) Select the learning materials or resources.
  - 5) Design the learning activities.
  - 6) Determine the modes of assessment.

Cont…

- In performing each step, an instructional designer seeks to answer the following basic questions:

1) Who are our learners? What do they already know and how do they learn best?
2) What do we want our learners to learn? Why?
3) How do we structure the learning to achieve our learning objectives?
4) What learning resources are appropriate, effective, and available?
5) What strategies will we use to ensure that effective learning takes place? What combination of activities will enable the learners to achieve the learning objectives?
6) How do we know whether the learners are learning/have learned what they are supposed to learn? How do we assess learning?

Instructional Design Con't

- A systematic process of Instructional Design enables an educator to:
  - Identify the performance problem
  - Determine the goals and objectives
  - Define your learners and their needs
  - Develop strategies to meet needs and goals
  - Assess learning outcomes
  - Evaluate if goals, objectives and needs are met

Characteristics of instructional design

According to Branch and Merrill (2002), there are characteristics that should be present in all instructional design models:

1.Instructional design is learner centered.
2. Instructional design is goal oriented.
3. Instructional design focuses on real world performance.
4. Instructional design focusses on outcomes that can be measured in a reliable and valid way.
5. Instructional design is empirical.
6. Instructional design typically is a team effort.

Instructional design model

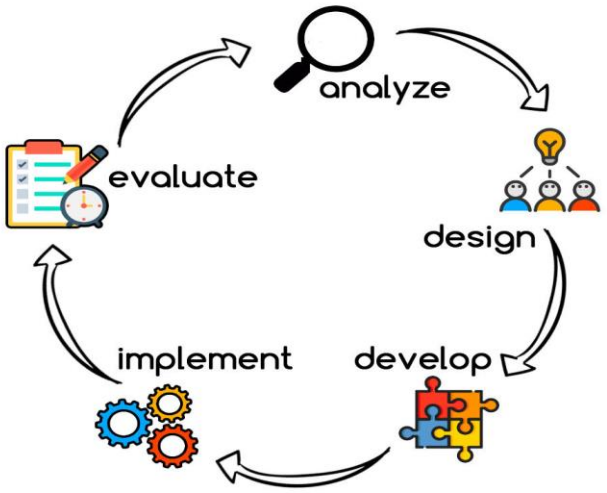
- An instructional design model is a tool, a framework to develop instructional materials.
- It helps instructional designers provide a structure and meaning to the learning material. It allows them visualize the training need and break down the process of designing training material into steps. These models provide guidelines to ensure training addresses the learning objectives and meets the desired expectations.

A Useful Model For Designing Instructional Materials Is The

ADDIE MODEL

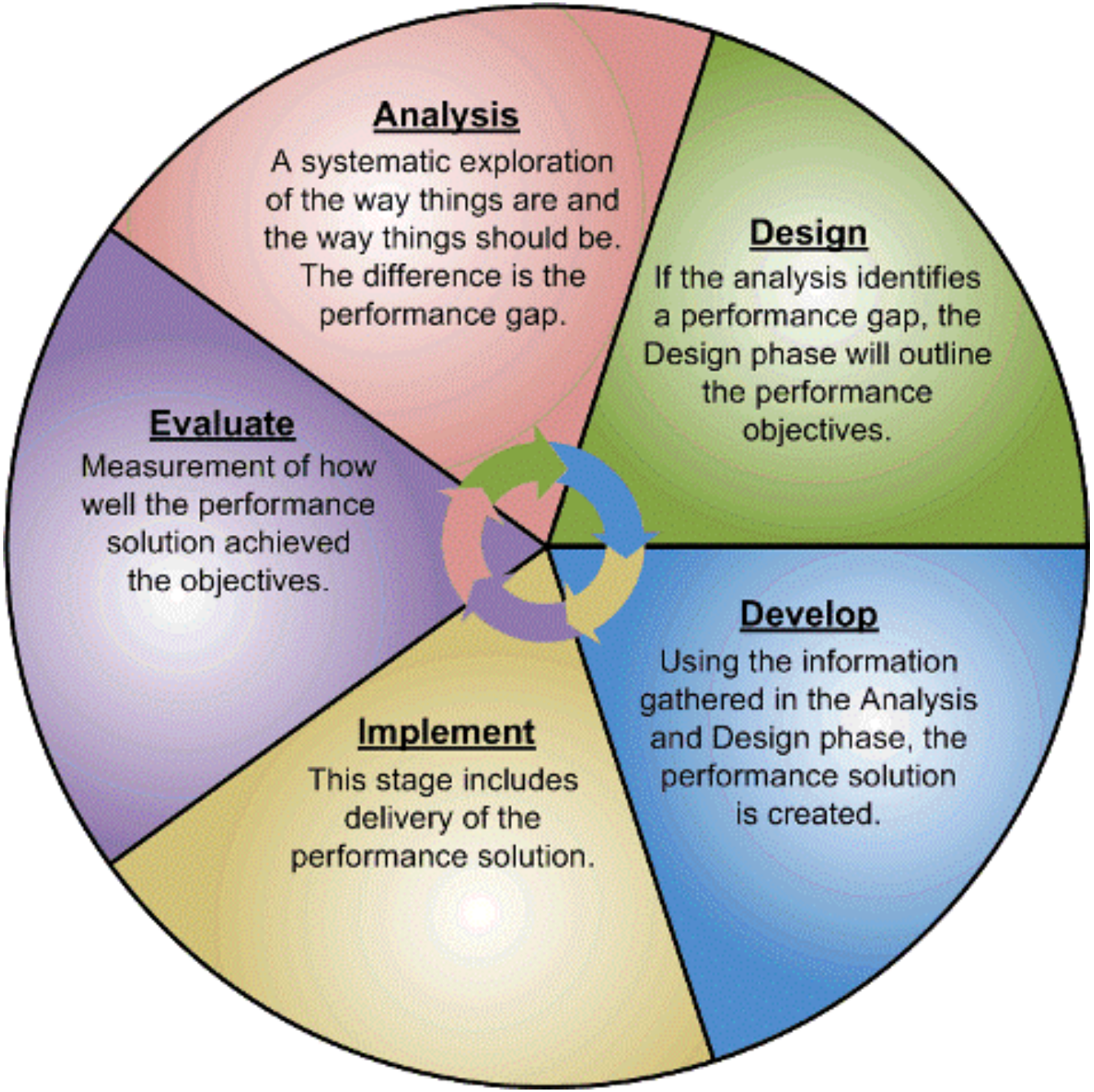
ADDIE Model

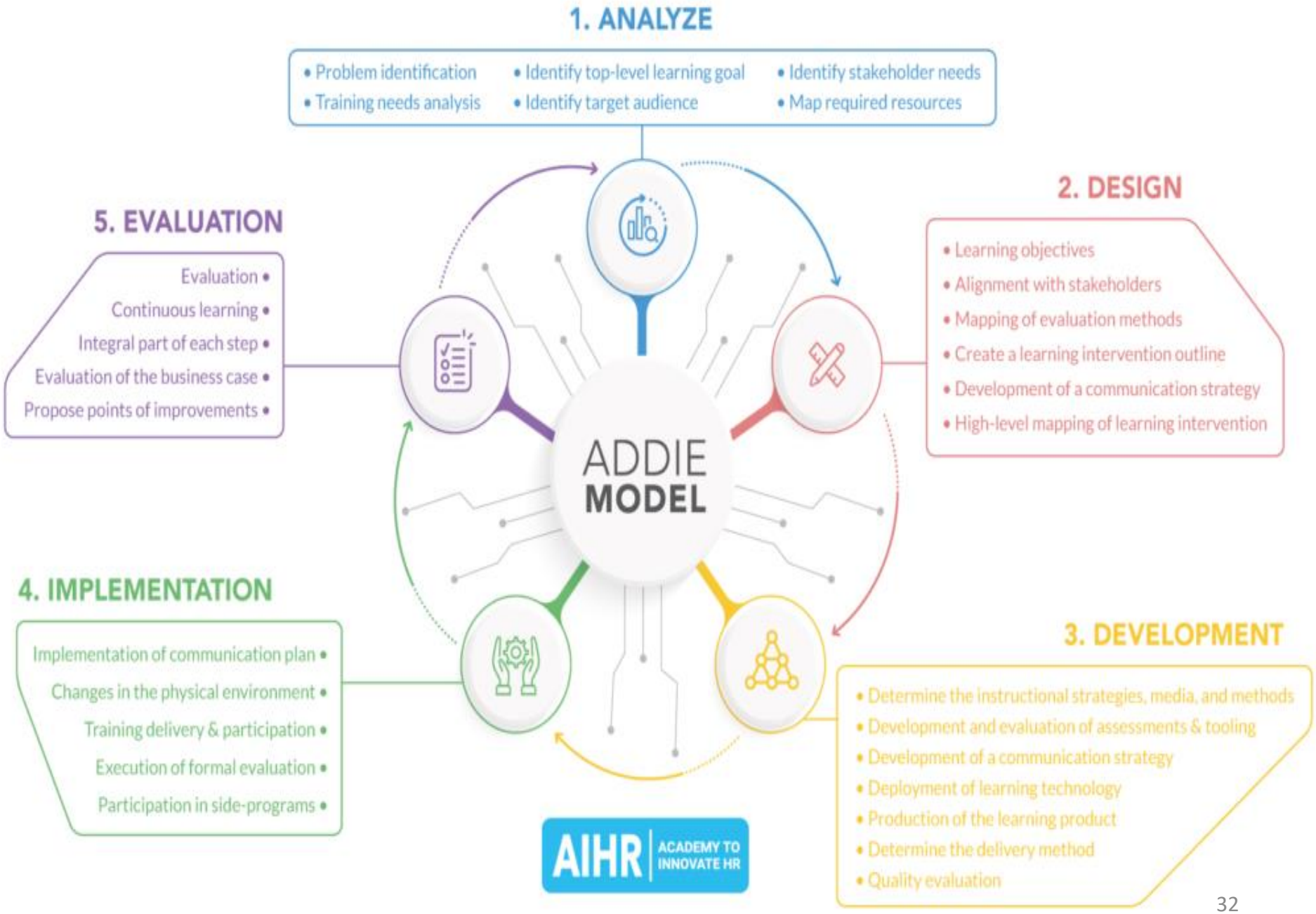
- The ADDIE model is used by instructional designers and training developers. It is composed of five phases
  - Analysis,
  - Design,
  - Development,
  - Implementation, and
  - Evaluation



- This model attempts to save time and money by catching problems while they are still easy to fix.

ADDIE Model

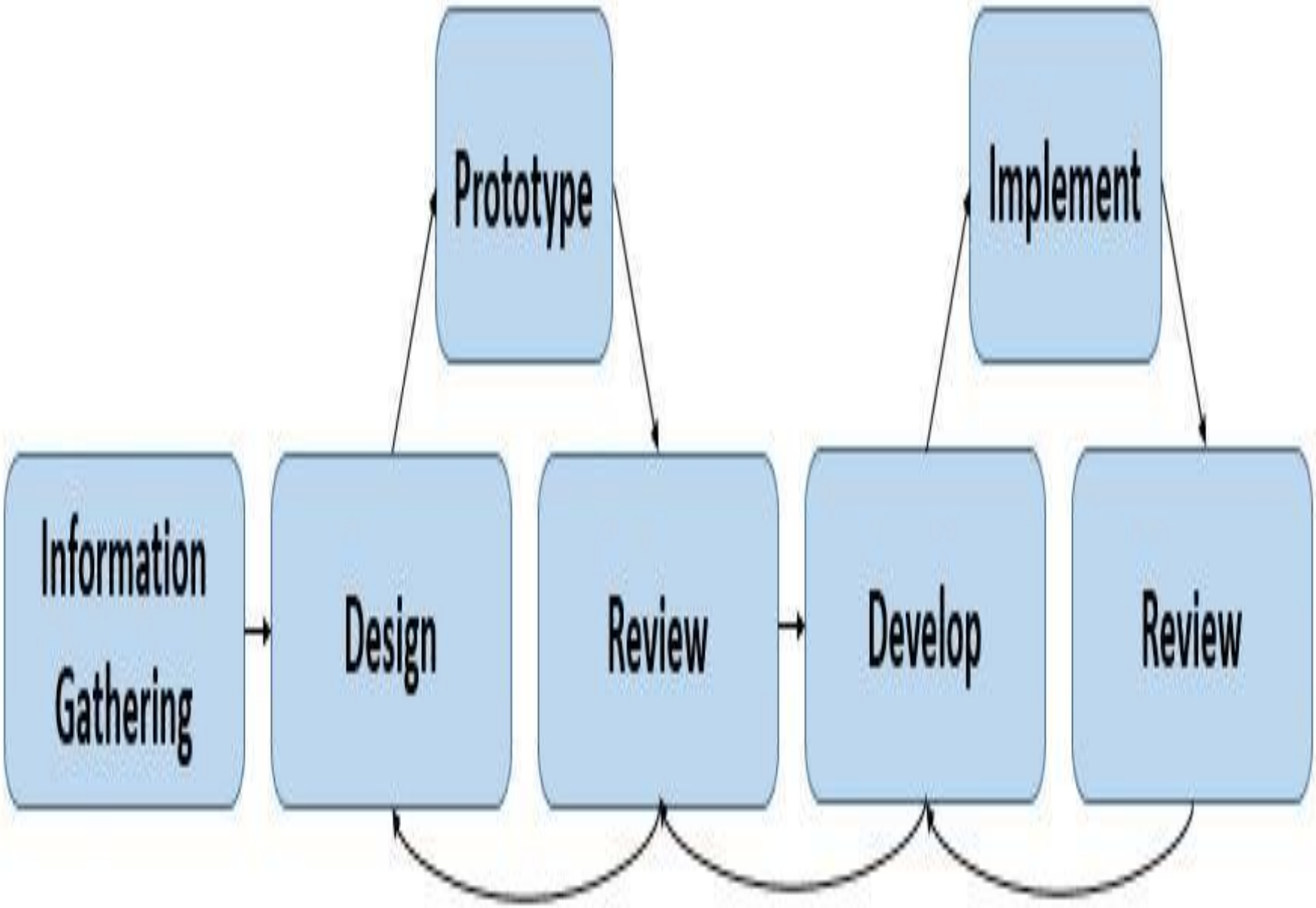

Analysis
A systematic exploration of the way things are and the way things should be. The difference is the performance gap.
Design
If the analysis identifies a performance gap, the Design phase will outline the performance objectives.
Develop
Using the information gathered in the Analysis and Design phase, the performance solution is created.
Implement
This stage includes delivery of the performance solution.
Evaluate
Measurement of how well the performance solution achieved the objectives.


1. ANALYZE
• Problem identification
• Training needs analysis
• Identify top-level learning goal
• Identify target audience
• Identify stakeholder needs
• Map required resources
2. DESIGN
• Learning objectives
• Alignment with stakeholders
• Mapping of evaluation methods
• Create a learning intervention outline
• Development of a communication strategy
• High-level mapping of learning intervention
3. DEVELOPMENT
• Determine the instructional strategies, media, and methods
• Development and evaluation of assessments & tooling
• Development of a communication strategy
• Deployment of learning technology
• Production of the learning product
• Determine the delivery method
• Quality evaluation
4. IMPLEMENTATION
Implementation of communication plan •
Changes in the physical environment •
Training delivery & participation •
Execution of formal evaluation •
Participation in side-programs •
5. EVALUATION
Evaluation •
Continuous learning •
Integral part of each step •
Evaluation of the business case •
Propose points of improvements •
ADDIE
MODEL
AIHR
ACADEMY TO
INNOVATE HR

Other Useful Models necessary For Designing Instructional Materials

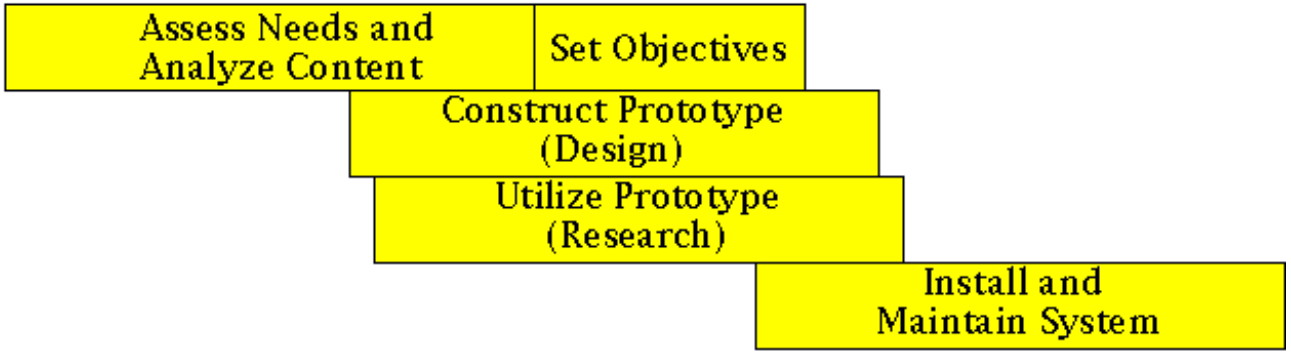
Prototypes

- A prototype is a partial realization of a product constructed for the purpose of testing one or another characteristic of the design.
- Using prototypes to test products in the early stages of development is far less expensive than waiting until a great deal of time and energy is invested in the finished product: design flaws can be diagnosed and remedied early on; new ideas can be tried and either scrapped or fine-tuned before they must be replicated on a large scale.


Prototype
Implement
Information Gathering
Design
Review
Develop
Review

Rapid prototyping

In a design process, early development of a small-scale prototype used to test out certain key features of the design. Rapid prototyping develop learning experiences in a continual design-evaluation cycle that continues throughout the life of the project.



Rapid prototyping allows the designer to start with a low fidelity medium (such as paper and pen) and move to increasingly higher fidelity prototypes as time goes on.

Cont…

Rapid prototyping -- the spiral cycle:

1. concept definition
2. implementation of a skeletal system
3. user evaluation and concept refinement
4. implementation of refined requirements
5. user evaluation and concept refinement
6. implementation of refined requirements
7. Etc, etc in a continuous cycle

How content can be organized in rapid prototyping

Step 1 – Get attention

Step 2 – Set direction

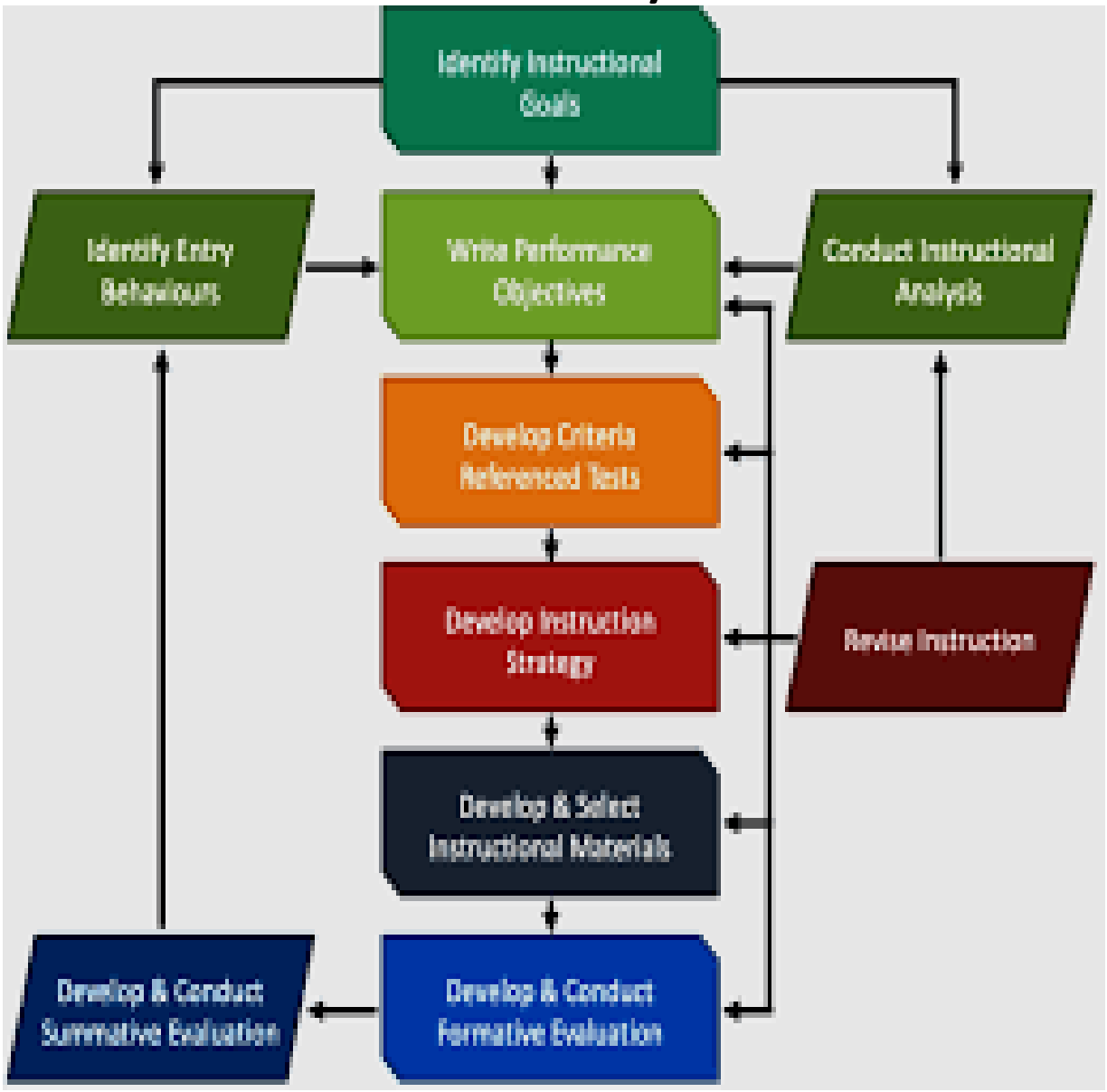
Step 3 – Present

Step 4 – Show and Try

Step 5 – Summarize

Step 6 – Action and Support

The Dick & Carey instructional design model



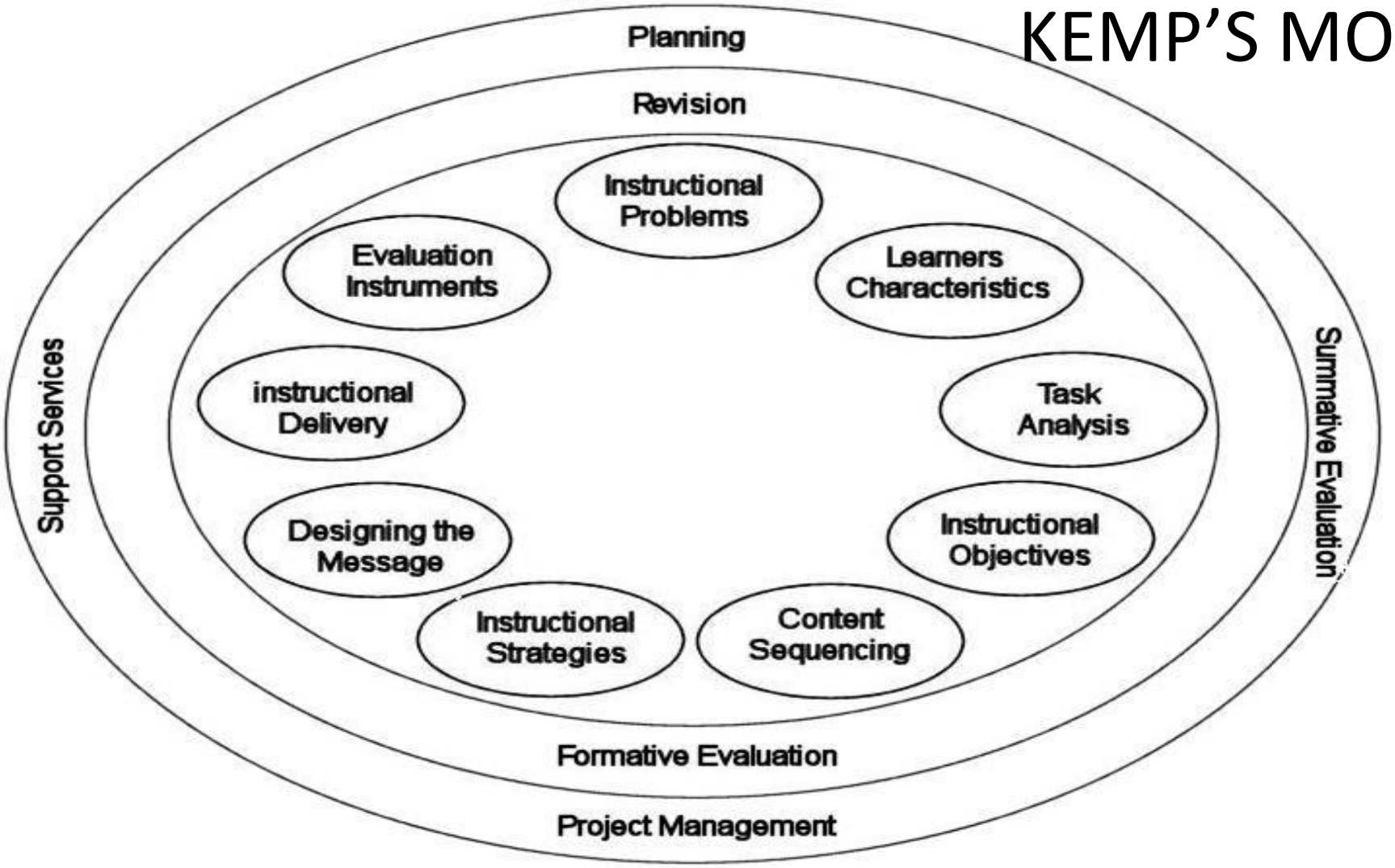
The Dick & Carey instructional design model is a ten step process for planning training and development initiatives. The Dick and Carey Model is an instructional systems design (ISD) model taking a systems approach and based on the research of Walter Dick of Florida State University and Lou and James Carey of the University of South Florida.

- **Stage 1. Instructional Goals**-The first step is to determine the instructional goals. This means that you are able to, or will be able to, identify what it is the students need to learn.
- **Stage 2. Instructional Analysis**- Instructional analysis is the second step. This means you are determining the skills that your students will need to learn what you plan to teach them.
- **Stage 3. Entry Behaviors and Learner Characteristics**- Next you have to assess which skills the students have out of those that you previously determined are needed for this lesson. These skills will be crucial to the lesson's success with each student.
- **Stage 4. Performance Objectives**- Next, you must figure out specific goals and objectives for the lesson. These objectives must be detailed. Details will help you make sure you are teaching your students what matters most from the lesson.

- **Stage 5. Criterion-Referenced Test Items**-The fifth stage involves creating a test (consistent with the performance objectives) that will reflect what you're hoping to teach the students. Referring back to notes you have made will help you figure out what to test. These are meant to help the students understand what they have or have not mastered yet, and are a checkpoint for the parents or administrators.
- **Stage 6. Instructional Strategy**- Sixth, you begin to outline your lesson plan. This means that you will be able to demonstrate what you want them to learn, add activities, and decide how each segment will be done. If you want to have group activities, now is the time to decide when and what materials will be covered by the activity.
- **Stage 7. Instructional Materials**- Seventh, you make sure you have what you need ready for the lesson. If you have something you already know will work, use it.

- **Stage 8. Formative Evaluation**- Next, you would have to evaluate how the lesson went. Were there some students who weren't too thrilled with the group work? Did your groups not work well? Did some students sit back while others did all the work, expecting to ride along for a good grade? You could use this time to go for a field trip or to work in smaller groups. You could even do one on one if you have a small enough group.
- **Stage 9. Summative Evaluation**- Ninth, you revise. If all you do is teach a class on a topic, you have a good opportunity to revise the class.
- **Stage 10. Revise Instruction**: Use the data from the two types of evaluations to examine the validity of the instructional material and revise as needed.

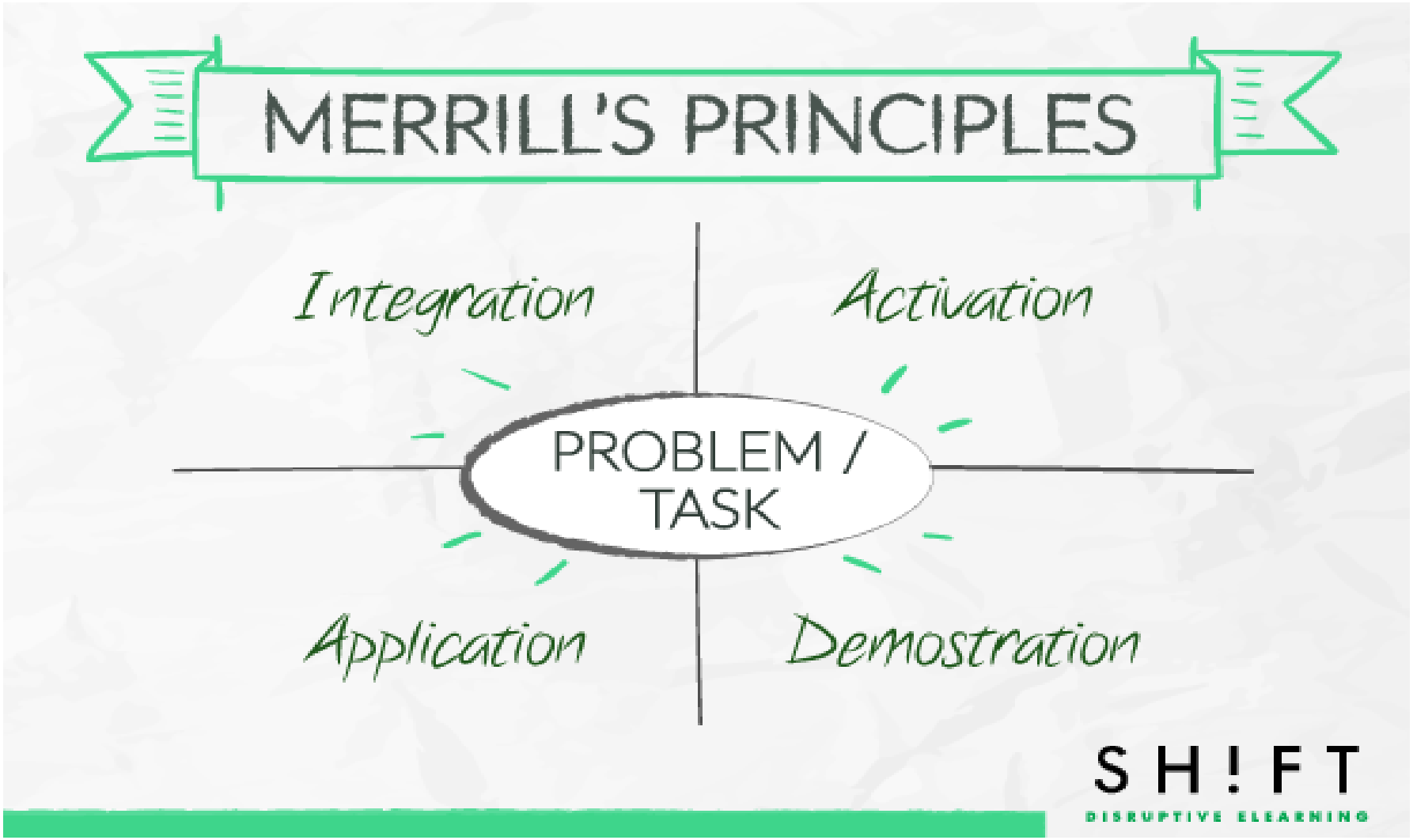
KEMP'S MODEL



The Kemp Design Model is circular, rather than linear (Akbulut, 2007). That is, the nine elements of this model are interdependent and are not required to be considered in an orderly way to realize the instructional learning systems design. It is also unique in its non-linear structure and the interrelated nature of those main components allowing for flexibility as the ID moves through the nine stages of this design.

1. Determine the specific goals, and also identify potential instructional issues.
2. Identify characteristics of learners that should be taken into account during the planning process.
3. Clarify course content, and analyze the proposed task components in relation to the stated goals and purposes of the course.
4. Define instructional objectives and desired learning outcomes.
5. Ensure that content for each instructional unit is structure sequentially and logically to facilitate learning.

6. Design instructional strategies to enable individual learners to master the content, and achieve desired learning outcomes.
7. Plan the instructional message and the appropriate mode of delivery.
8. Develop evaluation instruments suitable for measuring and assessing learners' progress towards achieving course objectives.
9. Choose the appropriate resources that will support both teaching and learning activities.



Merrill's Principles of Instruction is one of the most straightforward, simplest instructional design models examined, yet it packs a lot of power because Merrill believed effective learning experiences are rooted in problem-solving. Merrill's First Principles of Instruction is a problem-based theory. Learners use four different phases in this design.

The principles promote learning in the following manner:

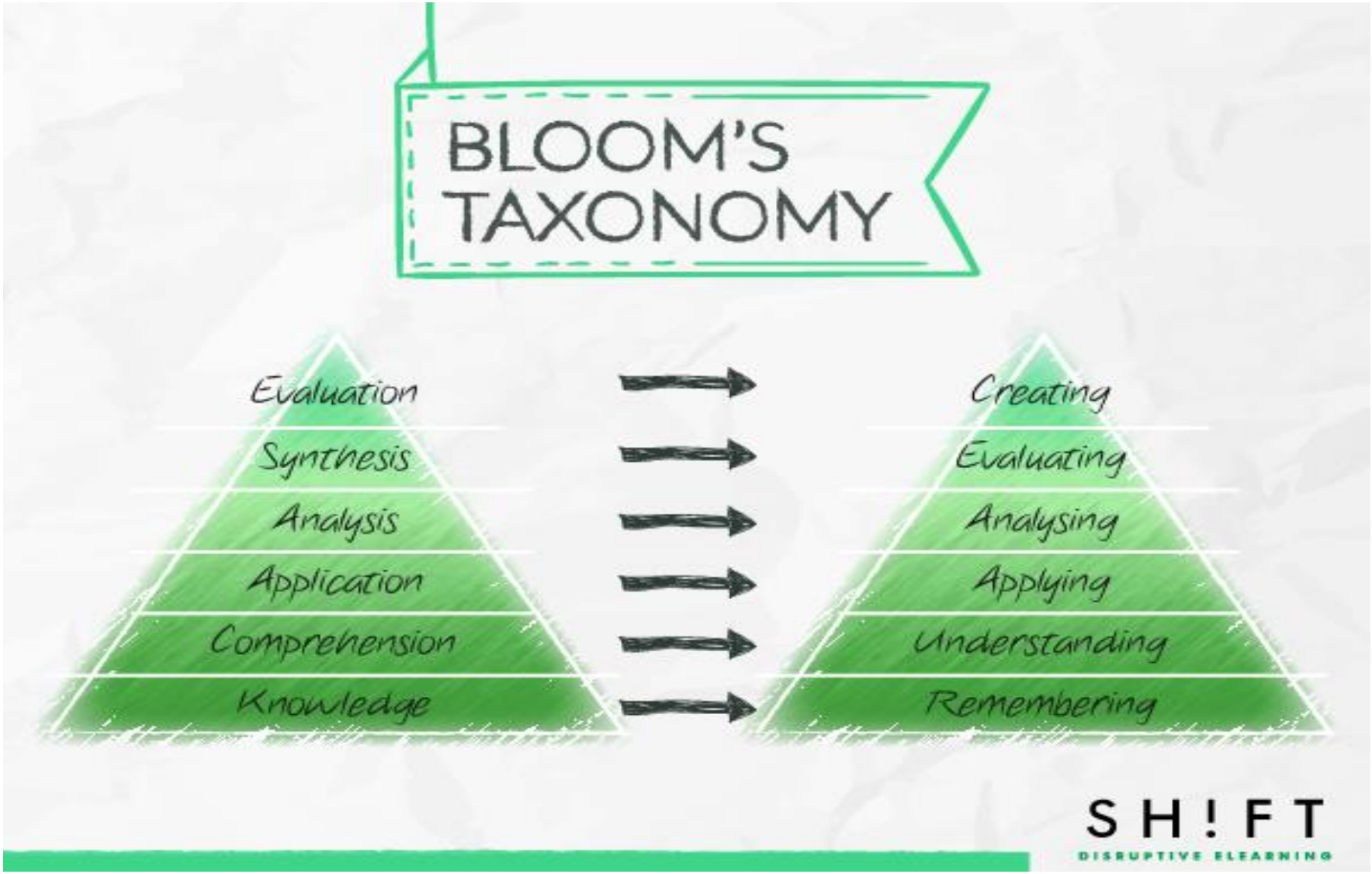
- Learning starts with real-world problems. Students should be able to relate to **problems and tasks** they can handle. (Task-centered)

- A course must **activate existing knowledge base** of the learner; hence aiding them connect previous knowledge with the new one. (Activation)

- A course must **demonstrate the knowledge** (both visually and through story telling) so that it leverages different regions of the brain, hence retaining it longer. (Demonstration)

- Allow them to **apply new information** on their own. Let them practice and learn from their mistakes. Let them see how your new material works in concrete situations. (Application)

- The course must offer possibilities for **integrating the knowledge** into the learner's world through discussion, reflection, and/or presentation of new knowledge. (Integration)



Bloom's Taxonomy, revised in 2001 by Anderson and Krathwohl, defines the six levels of cognitive learning starting with the simplest at the bottom and moving up through the levels to the most complex, or deepest learning.

Definitions	I. Remembering	II. Understanding	III. Applying	IV. Analyzing	V. Evaluating	VI. Creating
Bloom's Definition	Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.	Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.	Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.
Verbs	• Choose • Define • Find • How • Label • List • Match • Name • Omit • Recall • Relate • Select • Show • Spell • Tell • What • When • Where • Which • Who • Why	• Classify • Compare • Contrast • Demonstrate • Explain • Extend • Illustrate • Infer • Interpret • Outline • Relate • Rephrase • Show • Summarize • Translate	• Apply • Build • Choose • Construct • Develop • Experiment with • Identify • Interview • Make use of • Model • Organize • Plan • Select • Solve • Utilize	• Analyze • Assume • Categorize • Classify • Compare • Conclusion • Contrast • Discover • Dissect • Distinguish • Divide • Examine • Function • Inference • Inspect • List • Motive • Relationships • Simplify • Survey • Take part in • Test for • Theme	• Agree • Appraise • Assess • Award • Choose • Compare • Conclude • Criteria • Criticize • Decide • Deduct • Defend • Determine • Disprove • Estimate • Evaluate • Explain • Importance • Influence • Interpret • Judge • Justify • Mark • Measure	• Adapt • Build • Change • Choose • Combine • Compile • Compose • Construct • Create • Delete • Design • Develop • Discuss • Elaborate • Estimate • Formulate • Happen • Imagine • Improve • Invent • Make up • Maximize • Minimize • Modify

Gagne's Nine Events of Instruction

Gagne's Nine Events of Instruction

1. **Gain attention** - Curiosity motivates students to learn.
2. **Inform learners of objectives** - These objectives should form the basis for assessment.
3. **Stimulate recall of prior learning** - Associating new information with prior knowledge can facilitate the learning process.
4. **Present the content** - This event of instruction is where the new content is actually presented to the learner.
5. **Provide "learning guidance"** - use of examples, non-examples, case studies, graphical representations, mnemonics, and analogies.
6. **Elicit performance (practice)** - Eliciting performance provides an opportunity for learners to confirm their correct understanding, and the repetition further increases the likelihood of retention.
7. **Provide feedback** - guidance and answers provided at this stage are called formative feedback.
8. **Assess performance** - take a final assessment.
9. **Enhance retention and transfer to the job** - Effective education will have a "performance" focus.

1.Gain attention (reception)	• Begin the lesson with a startling statement/statistic, a rhetorical question, a provocative quotation or a challenge that can motivate learners' "need to know" and establish a common ground to address an existing deficiency, gap or problem. • Use humour, vary media, and get students involved; these are elemental to effective communication.
2. Inform learners of the objectives (expectancy)	• Review course objectives with students. • Explain how meeting the objective is useful to the students in terms of real-world applications.
3. Stimulate recall of prior learning(retrieval)	• Pre-test prior knowledge and prerequisite skills. • Ask students to share their current perceptions of the topic. • Create a concept map of prior knowledge. • Provide students with advance organisers in order to help learners make their own bridges between concepts and learn them
4. Present the stimulus(selective perception)	• Lecture in small chunks whenever possible. • Use a variety of media and methods in presenting information. • Show examples to clarify concepts.
5. Provide learner guidance(semantic encoding)	• Highlight important ideas, concepts, or rules. • Use repetition. • Provide students with learning strategies such as pneumonic memory techniques.
6. Elicit student performance (responding)	• Allow for several practice2 sessions over a period of time. • Provide role-play, case studies, or simulations. • Provide opportunities for knowledge acquisition through collaboration, discussion and negotiation by assigning group projects where students "meet" online
7. Provide feedback(reinforcement)	• Feedback should be immediate, specific, and corrective. • Allow additional practice opportunities after feedback is given.
8. Assess Performance(retrieval)¾	• Provide independent activities that test student knowledge/skill acquisition
9. Enhance retention and transfer (generalization)	• Highlight connections with other subject areas. • Apply learning in real-world situations by linking learning experience with personal life

Reigeluth's Elaboration Theory

1. Organizing Course Structure
2. Simple to complex
3. Within-lesson sequence
4. Summarizers
5. Synthesizers
6. Analogies
7. Cognitive strategies
8. Learner control

- **Organizing the Structure of the Coursework**
  The course must be organized in such a way that each lesson elaborates upon the previous lesson in the sequence. This can be done in one of three ways: conceptually, theoretically, or procedurally.
- **The simple to complex theory**
  Each lesson must go from simple to more complex, allowing the learners to build upon knowledge that they collected from the previous step in the process and then add elaborations in subsequent lessons.
- **Sequences within the lesson itself**
  The lesson must begin with a general overview, followed by a more detailed look. This can also be applied to abstract concepts, which are then viewed as more concrete or real-world based steps. It can also be simple to complex, abstract to concrete.
- **Summaries of the content**
  The instructor should encourage the learners to summarize what they have already learned and provide them with an overview of all previously learned steps at the end of each lesson.

- **Synthesizers**
  Presentation devices that help the learner integrate content elements into a meaningful whole and assimilate them into prior knowledge, e.g. a concept hierarchy, a procedural flowchart or decision table, or a cause-effect model .
- **Cognitive strategies**
  Learners acquire the knowledge better, when they use cognitive strategies either consciously or unconsciously. For example, the use of diagrams makes an impact on how the learner processes and interacts with the learning material (imbedded strategy). In addition, the instructor may lead the learner to a previously acquired cognitive strategy (detached strategy) by posing specific questions. A variety of cues - pictures, diagrams, mnemonics, etc. - can trigger cognitive strategies needed for processing of material.
- **Learner Control**
  The learners are encouraged to have complete control over how the instruction is carried out and the content being learned. Clear labelling and separation of strategy components facilitates effective learner control of those components.
- **Analogies or Metaphors**
  These allow the learners to relate the content to real world scenarios or learners' prior knowledge, use multiple analogies, especially with a highly divergent group of learners.

The ASSURE Model

- **A**nalyze learners
- **S**tate objectives
- **S**elect methods, media, and materials
- **U**tilize media and materials
- **R**equire learner participation
- **E**valuate and revise.

STRATEGY	DESCRIPTION
Analyze learners	General characteristics - grade, age, ethnic group, sex, mental, emotional, physical, or social problems, socioeconomic level, and soon. Specific entry competencies - prior knowledge, skills, and attitudes. Learning styles - verbal, logical, visual, and so on
State objectives /learning outcomes	The learning outcome may be primarily: Cognitive, Affective, and Psychomotor / Motor Skill
Select / modify instructional methods, media and materials	Choosing and using educational technology or media is a deliberate process, dependent for its success on having clear goals, and a rational and thoughtful method for matching characteristics with expected outcomes. Select the: • Instructional method (e.g., a lecture, group work, a field trip, etc.) that is most appropriate to meet the objectives for the particular group of students. • Materials relevant to the objectives. You can create your own materials or existing materials might be adopted and used as is or they might be adapted with suitable modifications. Media selection • Media should be selected on the basis of instructional method, objectives and student needs. • Students should have easy access to the selected media. • Must be appropriate for the learning objectives and teaching format. • Should be consistent with the students' capabilities and learning styles. • No single medium is the total solution. • Tutors and students should have the skills to use it.
Utilize media and materials	In order to utilize the media and materials listed above: • Always preview the materials before using them and also use the media tools in advance to be sure it works. • Don't assume that technology will always work, be ready with alternative plans. • Prepare the learners: Give the students an overview, explain how they can use it and how they will be evaluated during the course.
Require learner participation	• Incorporate questions and answers, self-assessments, discussions, group work, hands-on activities, and other ways of getting students actively involved in the learning process. • Make sure that all students have opportunity to engage in the learning activities. • Focus on student learning as opposed teaching them. • Provide opportunities to manipulate the information • Use strategies to get all students actively and individually involved in the lesson and allow time for practice during the demonstration of the skill.
Evaluate and revise	• Involve evaluation student performance, media components and instructor performance. • Reflect upon the stated objectives, the content, the instructional strategy, motivational strategies, the learning activities, the assessment, the time available to the students to study the content, and determine if they were effective or revise

UNIT TWO

Concept of TPACK

Objectives

By the end of the unit, students would be able to;

- describe the situation of teaching in Ghana with ICT
- explain TPACK
- develop a lesson plan using TPACK

- “If we teach today as we taught yesterday, then we rob our children of tomorrow”

John Dewey

Ask yourself this question:

HOW DO WE TEACH IN GHANA?

Teaching in Ghana

- Traditional teaching methods (teacher-centered approach dominates
- Teachers do all the talking, students listen and write a lot of notes
- Teacher questions requiring recall of facts
- Heavy emphasis on assessment
- Students do not take active participation (Hardly any hands-on activities)

What ICT can provide

- Helps improve students' understanding of concepts.

- Leads to learning gains and higher student achievement.

ICT education in Ghana

- Limited or no ICT integration in our context
- Stand alone technology courses (at best)

Digital Generation

- Students in this dispensation have grown up in a world where they are surrounded by technology (Oblinger & Oblinger, 2005; Prensky, 2001, 2005). Their daily lives are influenced by technology and most of these learners use various technological devices way before they even start formal school (Green et al., 2005). Digital cameras, computers, videogames, video cameras, digital music recorders and mobile phones are technologies to name a few that form part of the daily lives of students in this generation. Prensky (2001) held the view that in this generation there are learners who have been born into the technology and they are known as ‘digital natives’ and are therefore “native speakers” of the language of technology.

Digital Generation Cont…

- Students are digital natives. They've grown up with technology; it's woven into their lives. In fact, it's one of the basic 21st century skills that they'll need in school and the workplace. These students of this age already have a better understanding of computers and technology in general than their predecessors. Technology use has become the easiest way they learn, because it is such an integral part of their life. Engaging with technology in the classroom has not only helped them learn better, but they also acquire multi-tasking skills. At this day in age, they hardly know how to learn without it. This knowledge is important, because they would be way behind in the real world without it. Since students are already utilization technology in their daily lives, then it should fit into the principles of good teaching to use what students know and are good at to teach them.

Ways technology is used in education

- Technology has been found to possess abilities to foster effective pedagogy.
- Technology can foster discovery learning.
- Technology has the ability to encourage collaborative learning.
- Technology provides interactive content.
- Technology has the ability to enhance relationships between teachers and students.
- Technology has provided more efficient ways to communicate to and with students.
- Technology makes learning more fun and effective
- Technology allows one to learn at their own pace.
- With technology in the classroom, your students have instant access to fresh information that can supplement their learning experience.
- Technology can give teachers and students remarkable resources.

21st century skills for students

- Cooperation
- Communication
- ICT literacy
- Social and/or cultural skills
- Creativity
- Critical thinking skills
- Problem solving skills
- Productivity
- Learning to learn
- Self directed learning
- Planning
- Flexibility
- Math, Science, Languages
- Taking risks
- Metacognition
- Controlling / solving conflicts
- Initiative and entrepreneurism
- Interdisciplinary skills

WHAT IS TPACK?

- Technological Pedagogical Content Knowledge (TPACK) refers to the knowledge that emerges from an *understanding of an interaction of content, pedagogy, and technology knowledge.*

- Coined by Mishra & Koelher

Why TPACK?

- Learning “how to use” technology is different from knowing what to do with technology for teaching

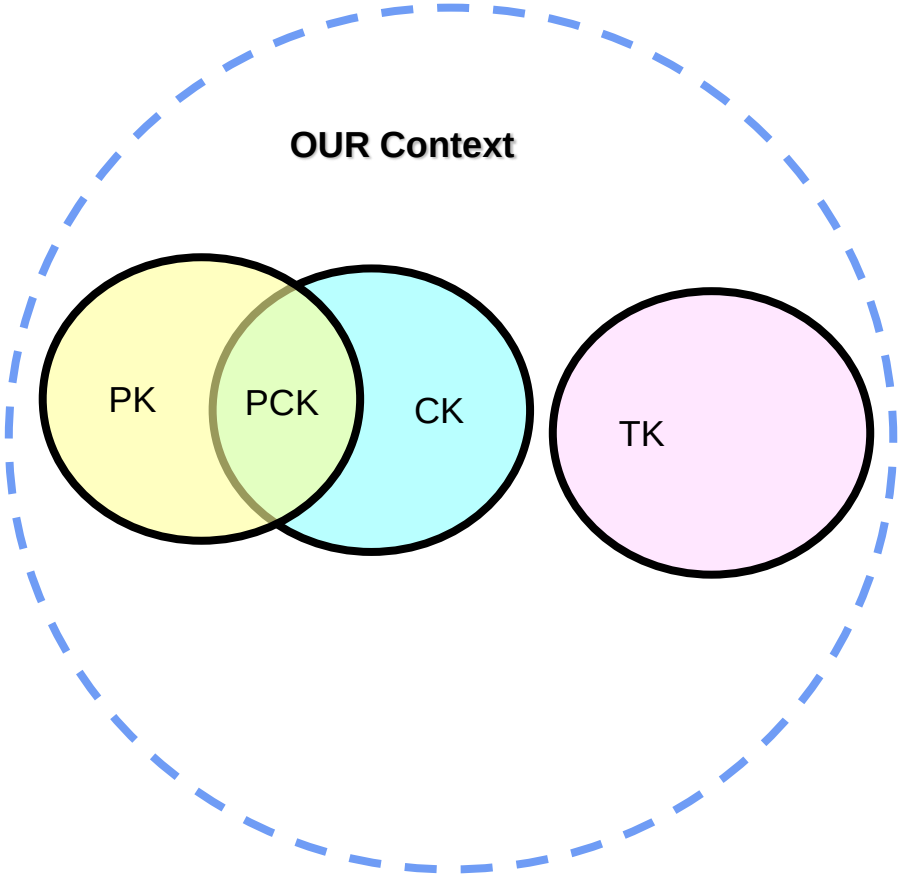
- A framework to understand teachers’ knowledge required for effective technology integration

Why TPACK?

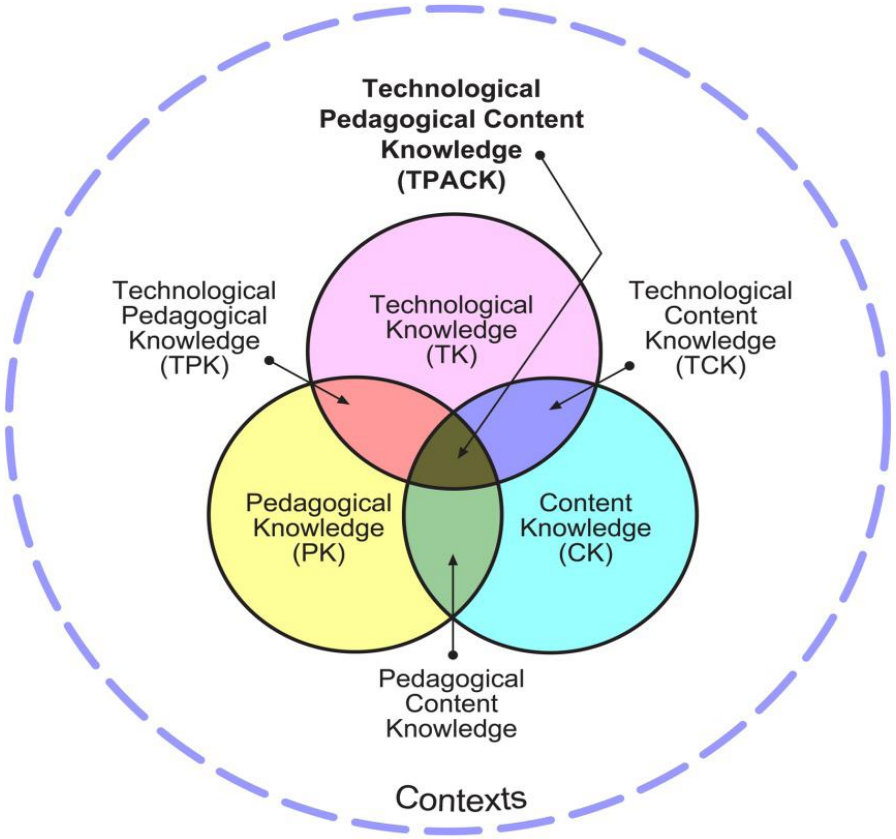
- Allows educators to bring ‘real world’ applications to the classroom
- Provides an opportunity for students to see and hear video clips and audio which can help to teach or reinforce concepts.
- Allows students to investigate, connect to and make discoveries previously unknown to the student.

In the classroom, it is important that the teacher must consider the

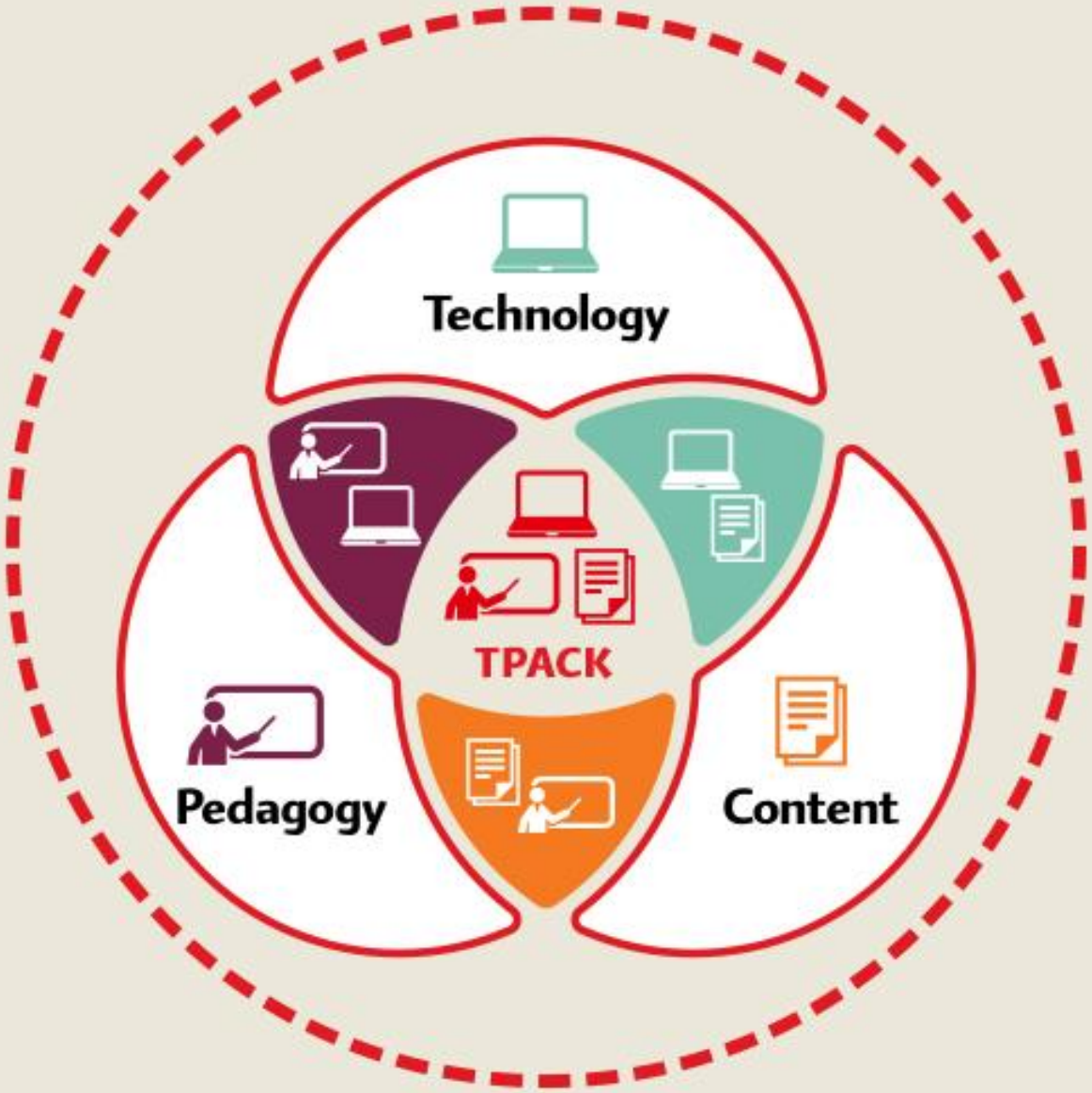
- **Concepts taught**
- **The best way to teach the subject**
- **And the technology that will enhance the lesson.**



Ideal situation is the TPACK framework



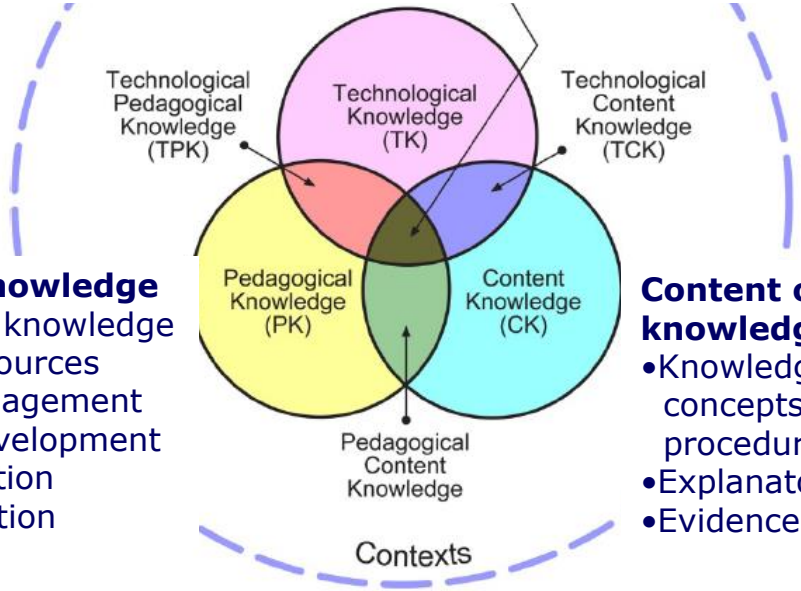
Technological Pedagogical Content Knowledge



http://tpack.org/

What is TPACK?

Technological (ICT) Knowledge
- Skills necessary to operate particular technologies
- The ability to learn and adapt to new technologies
- A functional understanding of technologies



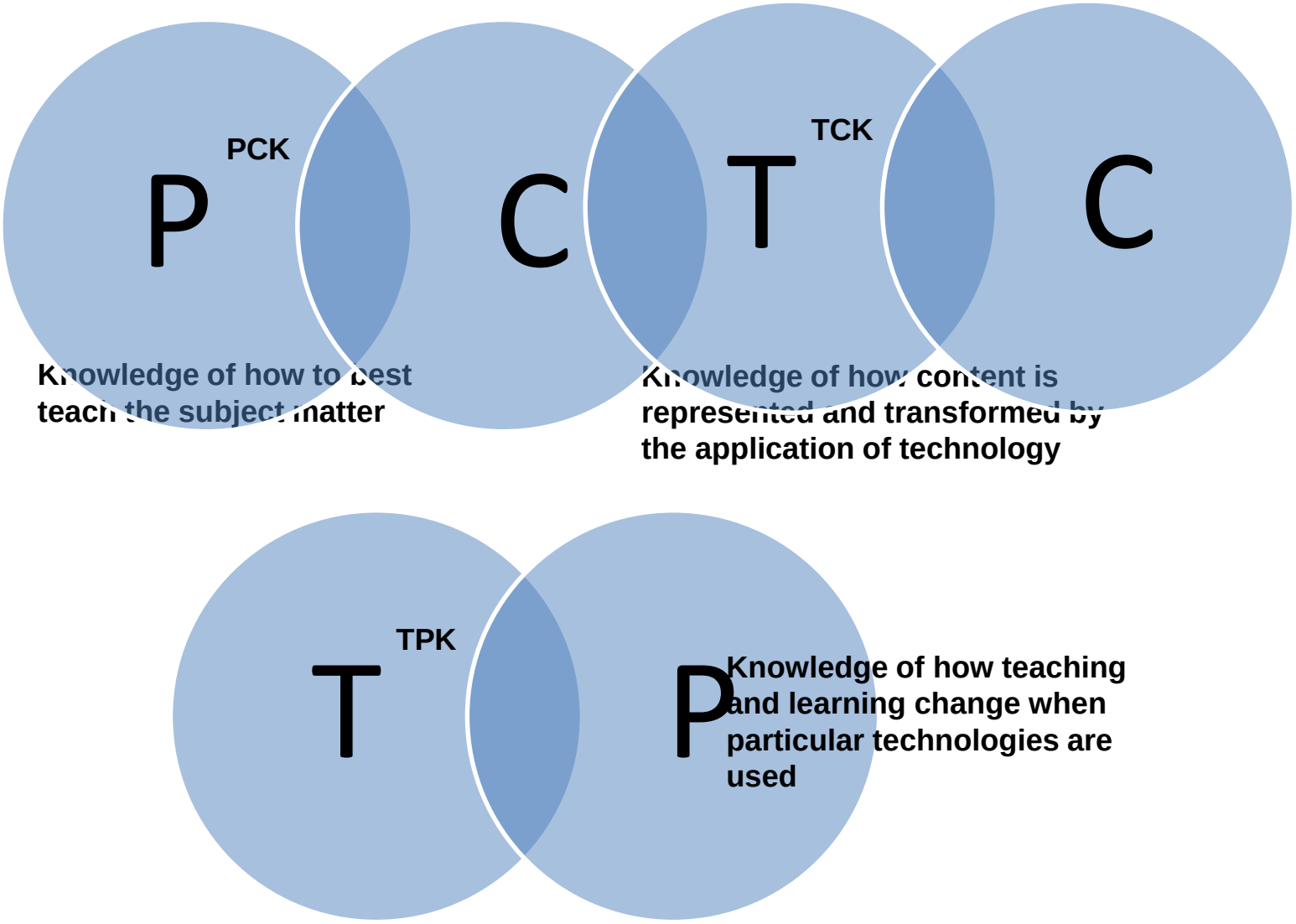
Pedagogical knowledge
- Students' prior knowledge
- How to use resources
- Classroom management
- Lesson plan development & implementation
- Student evaluation

Content or Subject matter knowledge
- Knowledge of central facts, concepts, theories & procedures
- Explanatory frameworks
- Evidence for proof

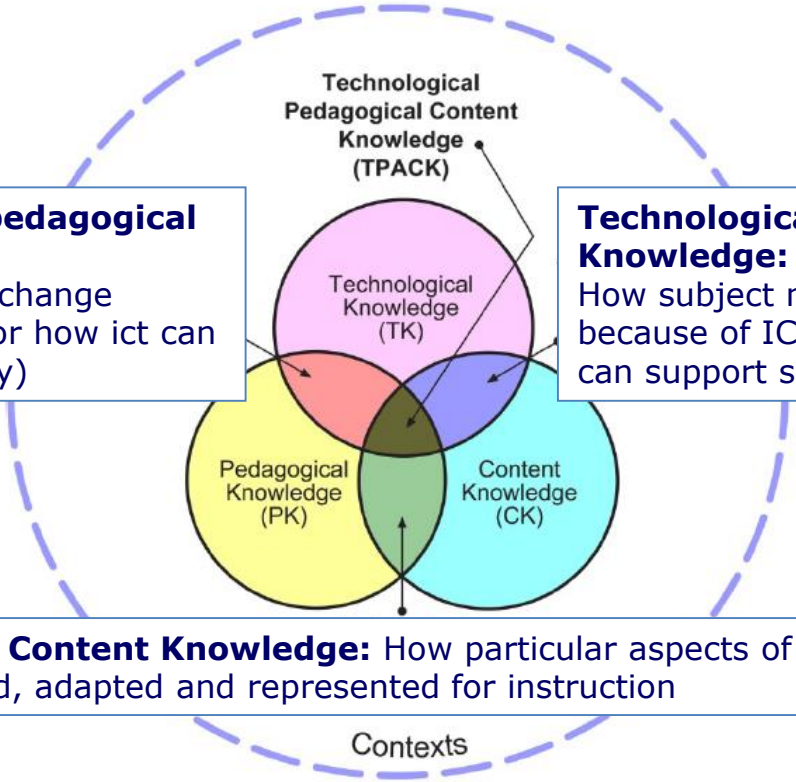
Exercise 1

Lets try and explain the following

- PCK
- TCK
- TPK


P
PCK
C
T
TCK
C
Knowledge of how to best teach the subject matter
Knowledge of how content is represented and transformed by the application of technology
T
TPK
P
Knowledge of how teaching and learning change when particular technologies are used

What is TPACK?



Technological pedagogical Knowledge:
How pedagogies change because of ICT (or how ict can support pedagogy)

Technological Content Knowledge:
How subject matter changes because of ICT (or how ict can support subject matter!)

Pedagogical Content Knowledge: How particular aspects of subject matter are organized, adapted and represented for instruction

Activity 1

Identify TPACK elements in 3 Lesson Plans provided.

- **In your groups study the lesson plans and see if you can identify some of the TPACK components in them.**
  - Technological Knowledge (TK)
  - Pedagogical Knowledge (PK)
  - Content Knowledge (CK)
  - Technological Pedagogical Knowledge (TPK)
  - Technological Content Knowledge (TCK)
  - Pedagogical Content Knowledge (PCK) and
  - Technological Pedagogical Content Knowledge (TPACK)
- **Highlight TPACK elements you identify with codes**
  - **TK, PK, CK, TPK, CPK, TCK, TPACK**

Playing with technology

- Blogs
- Television
- Computer
- MP3, MP4
- E-portfolio
- Mobile phone
- Wiki
- iPod
- Camera
- GPS
- CMS
- Online games

21st century competencies of the teacher

- knowledge of student thinking and learning (pedagogy)
- knowledge of subject matter (content), and increasingly,
- knowledge of technology

(Koehler & Mishra, 2006)

Challenges - technology integration in teaching

- Many teachers earned degrees at a time when educational technology was at a lower stage of development than it is today
- They do not consider themselves sufficiently prepared to use technology in the classroom
- They do not have opportunities to explore the value of technology or its relevance to teaching and learning
- They may not have the support from management to use technology
- Teachers do not have motivation as using technology may need more time and preparation for the lesson
- Training in the use of technology in the classroom is limited

How educators should be guided

- Identify parts of the curriculum that are hard to teach where technology might help overcome pedagogical or cognitive difficulties.

- Identify topics in the curriculum for which technology is an essential element of the science being taught.

- Learn how to use content and pedagogy with technology effectively

Possible Internet resources and searching skills

Objectives

By the end of this unit, the student would be able to:

- Explain the three classification of ICT resources.
- State examples of web resources in education
- Conduct basic search strategy.
- Using the mind-mapping / tree structure technique
- Develop internet skills for searching for appropriate information
- Evaluate appropriate information in education.

Internet resources

- A classification of ICT resources is presented in three main areas:
  - information resources (e.g., webgraphy and online databases),
  - collaboration resources (e.g., blogs and wikis)
  - learning resources (e.g., webquest, repositories of educational resources, podcasts and m-learning).

ICT Information Resources

- ICT resources provide additional information to address a topic from basic to advanced levels.
- Teachers are facing a new scenario which offers ample flexibility and availability of data sources and direct access to web resources.
- ICT and information resources can provide updated data in different media formats.
- Some ICT Information Resources will include the following: Webgraphy, virtual encyclopedias, online databases, web 2.0 tools (e.g., social bookmarks, YouTube and Slideshare) and visual search engines based on web 3.0 (semantic web).

ICT Collaboration Resources

- ICT resources for collaboration offer users the opportunity to participate in professional networks and co-create resources.
- Collaborative work allows the assessment of existing resources and their use in different contexts and then analyzes these resources to enable their creative use in collaborative learning contexts.
- Some collaborative ICT resources are mailing lists, groups and collaborative web 2.0 tools such as wikis and blogs. Webinar is a widely used tool for organizing online seminars.

ICT learning resources

- ICT resources for learning offer the possibility of acquiring knowledge, attitudes and procedures during the teaching process. ICT resources offer various forms of work with content and activities.
- An integrated design of learning resources is an important part of the instructional process that helps achieve the expected learning outcomes.
- Some ICT learning resources are repositories of educational resources, interactive tutorials, online quizzes, web 2.0 tools (e.g., eBooks, podcasts) and open online courses.

Examples of websites with resources

- https://www.profweb.ca/en
- www.youtube.com/technologyforteachersandstudents
- https://www.pinterest.com/
- https://education.microsoft.com/en-us)
- https://www.edutopia.org/
- https://www.learn-ict.org.uk
- www.docsity.com
- https://ed.ted.com

Downloading Multimedia From The Web

- **SaveFrom**
  - http://en.savefrom.net/
  - Helper: http://en.savefrom.net/user.php?helper=1&download=setup&rmode=false
- **Savemedia**
  - http://savemedia.com/
- **Keepvid**
  - http://keepvid.com/

Downloading Multimedia From The Web

- Using Savefrom.net/ **Savemedia/ Keepvid**
  - Go to Youtube.com
  - Select the video file
  - Start playing the file
  - Copy the URL in YouTube address Bar

Downloading Multimedia From The Web

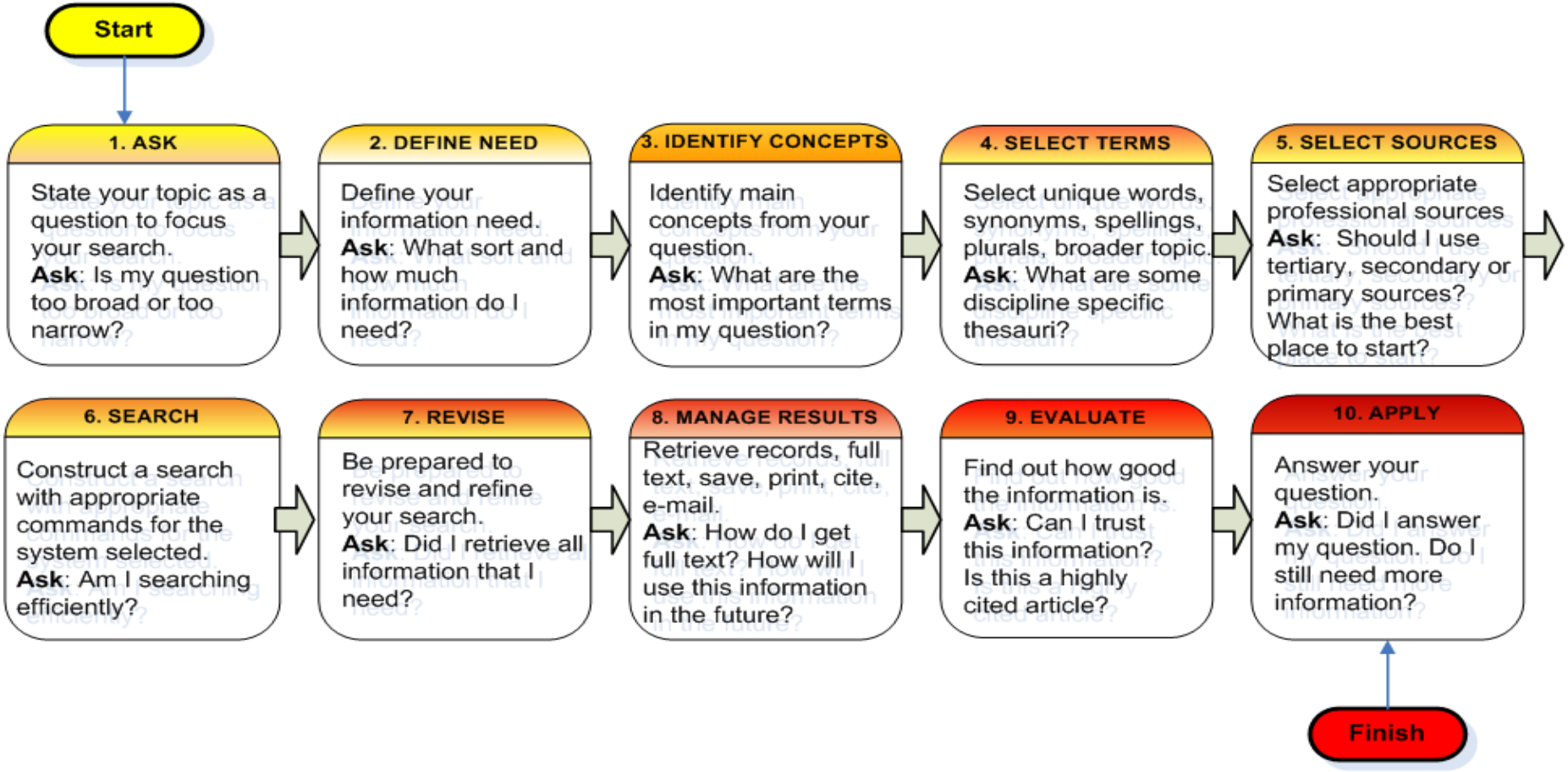
- Go to savefrom.net
- Paste the copied URL
- Press the Enter in savefrom.net text box
- Choose video format MPG 4/480p/720p
- Check download folder for the downloaded video file

Search Engines

- Basic search engines (Google, Yahoo, Bing) are useful when one needs background information or a place to start, but one must be cautious as limitless information leads to confusion and one does not always know where the information comes from.

Planning a Search Strategy

Developing a Search Strategy: Process Overview



Remember: Your question drives the search strategy. There is no one best way to search. Avoid one stop searching to prevent bias.

Search strategies and techniques

- **Keep it simple**

  Describe what you want in as few terms as possible. Some engines include

  stop words in their searches. These are frequently used words such as prepositions (in, of, on), conjunctions (and, but) and articles (a, the), which mean that you'll end up with more pages in your search results than you need. So, it's usually best to eliminate stop words from your internet searches.
- **Be specific**

  The more precise your search terms are, the more precise your search results will be. Avoid general or common words.
- **Imagine how the webpage you are hoping to find will be written**

  Use words that are likely to appear on that page.
- **Capitalization, punctuation and spelling don’t really matter**

  In most cases, search engines will ignore capitalization and punctuation in a search and will generally auto-correct your spelling mistakes.

Search strategies and techniques cont…

- **Narrow your search results**

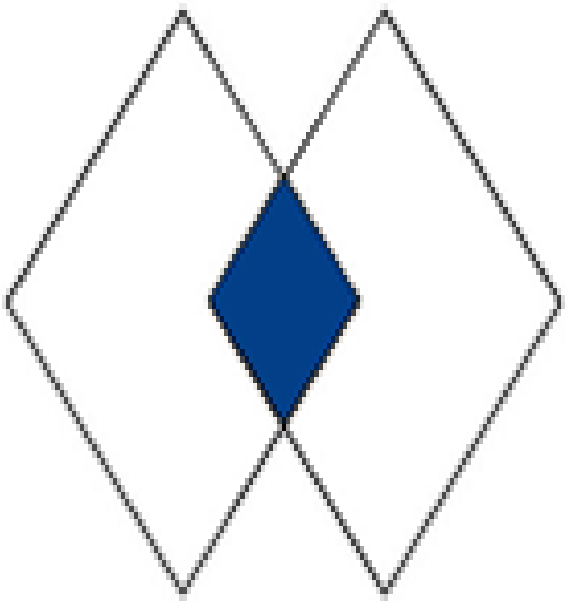
There are several ways to help you narrow your search results to find exactly what you're looking for. Other characters or terms, known as operators, allow you to narrow down your internet search in more targeted ways. We explore a few, below:

  - ***Wildcard Searches:*** use the * symbol as a placeholder for another word. For example, searching for *** man in the world** returns results for the richest man in the world, the tallest, the oldest, and so on. Wildcard searches are also useful when, for example, you don't know the full text of a quote.
  - Boolean connectors (**AND, OR, NOT**) to connect terms within your search.

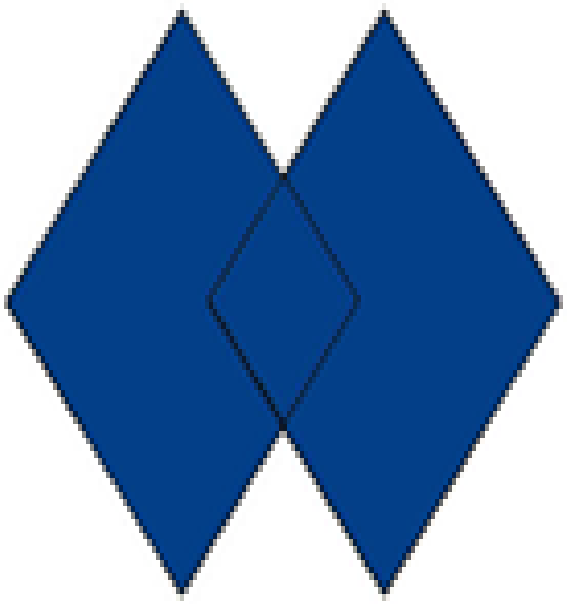
Boolean Operators

AND, OR, NOT Operator

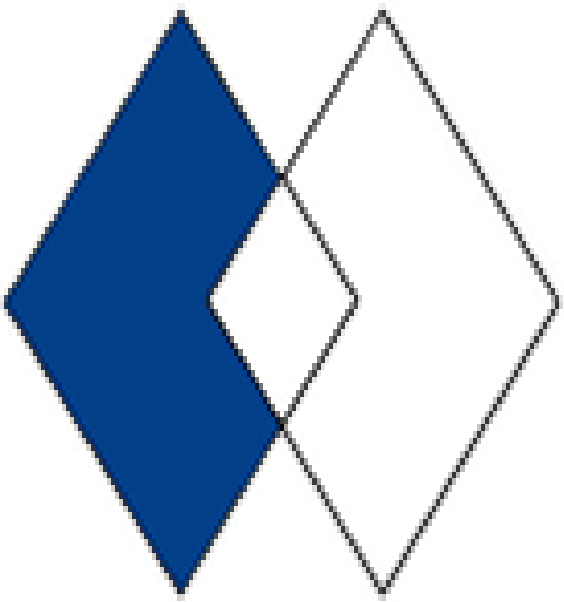
(to combine two concepts)



A AND B

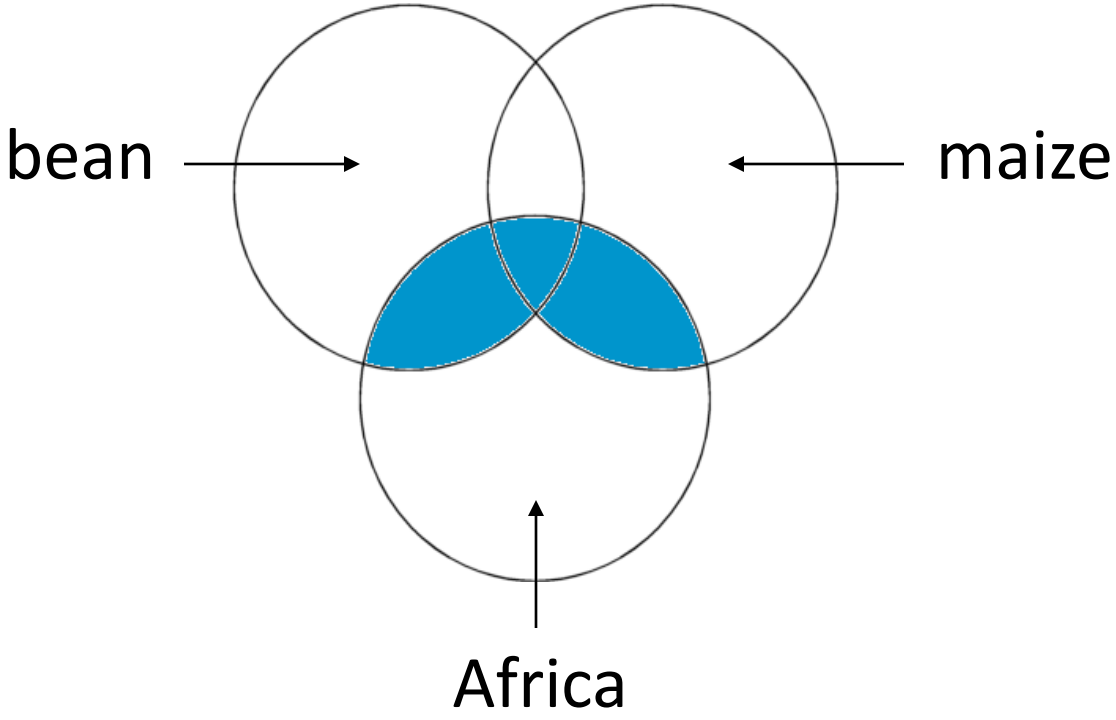


A OR B



A NOT B

Africa AND (bean OR maize)



Africa AND (bean or maize) – in the shaded area
The **(OR)** operator retains items in each term and the **AND** operator is used to combine two concepts

Other search engine functions

- Phrase or proximity searching: **"…"** or **(…)**
  - allows you to search for an exact phrase, e.g. pests and **(**bean cultivation**)**
- Truncation/wildcards: *****
  - allow you to search alternative spellings and plurals

  river***** for river OR rivers

  pesticide***** for pesticide OR pesticides

  program***** for programme or program
- Alternate spellings: **?**
  - can be used to substitute for characters anywhere in a word

    wom?n for woman or women

Other search engine functions cont…

- Quotation marks to specify a phrase or an exact match,- e.g. "**action research"**, **“human rights”.**
- Asterix **(*)** for truncation – e.g. **school*** to find **schools** or **schooling.**
- Question mark **(?)** as a ‘wildcard’ – e.g. **democrati?ation** to find **democratisation** or **democratization** (*note* – this one is not as common as other rules above)
- Brackets for grouping (determining the order in which terms will be combined).

The Information landscape

- Before you begin your search, you must:
  1. Understand & define your information need
  2. Map the information landscape
     - Plot terms associated with the domain / sub-topics
     - Identify gaps in your knowledge
  3. Use the information mind map to:
     - Define focus of attention / approach (i.e. theoretical framework)
       - Plot broad subject / subject terms
       - Link to narrow subject / subject terms

1. Understand & define the Information Need

- By reframing the ‘research brief’ you could improve your understanding of the information needed.
- What is the brief asking you to look for? Discuss (Pairs / Groups)
- Is this a broad or narrow topic?
- What tools could you use to help you plot the scope of your information need? Discuss (Pairs / Group)

Mapping the landscape

- To understand the breadth of your research you must:
  - Plot the information landscape
    - Subjects terms; concepts; ideas associated with research area
  - Identify what you know about the domain / sub-topics
    - Brainstorming; iterative; may lead to dead-ends
  - Awareness of ‘gaps’ in knowledge / information needs will define search strategy

Mind map & Tree Structures

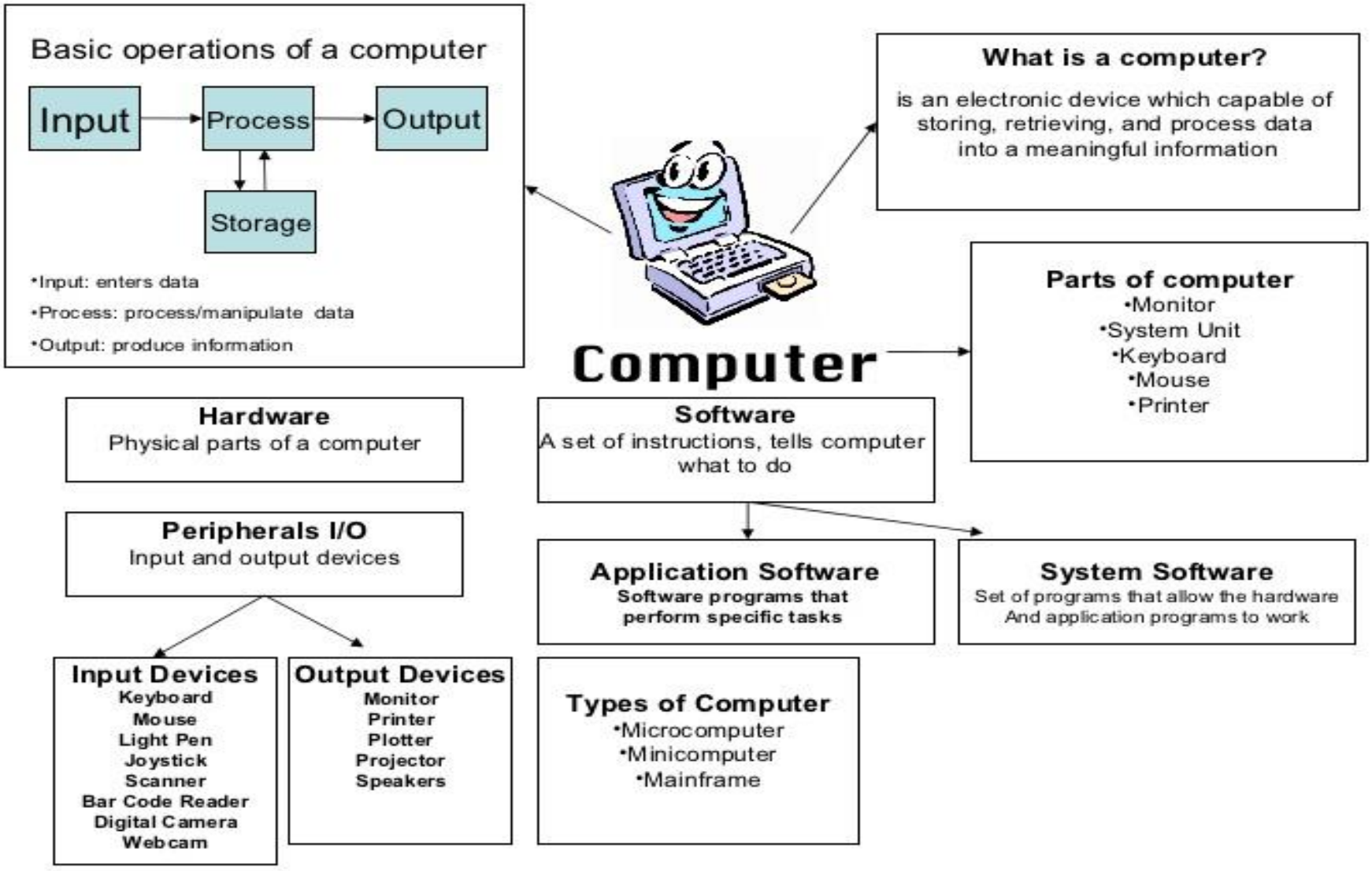
Mind map & Tree Structures are diagrams used to generate, visualize, structure and classify ideas, and as an aid in study, organization, problem solving, decision making, and writing.

Mind map is a diagram used to represent words, ideas, tasks or other items linked to and arranged radially around a central key word or idea. It is an image-centered diagram that represents semantic or other connections between portions of information. By presenting these connections in a radial, non-linear graphical manner, it encourages a brainstorming approach to any given organizational task, eliminating the hurdle of initially establishing an intrinsically appropriate or relevant conceptual framework to work within.

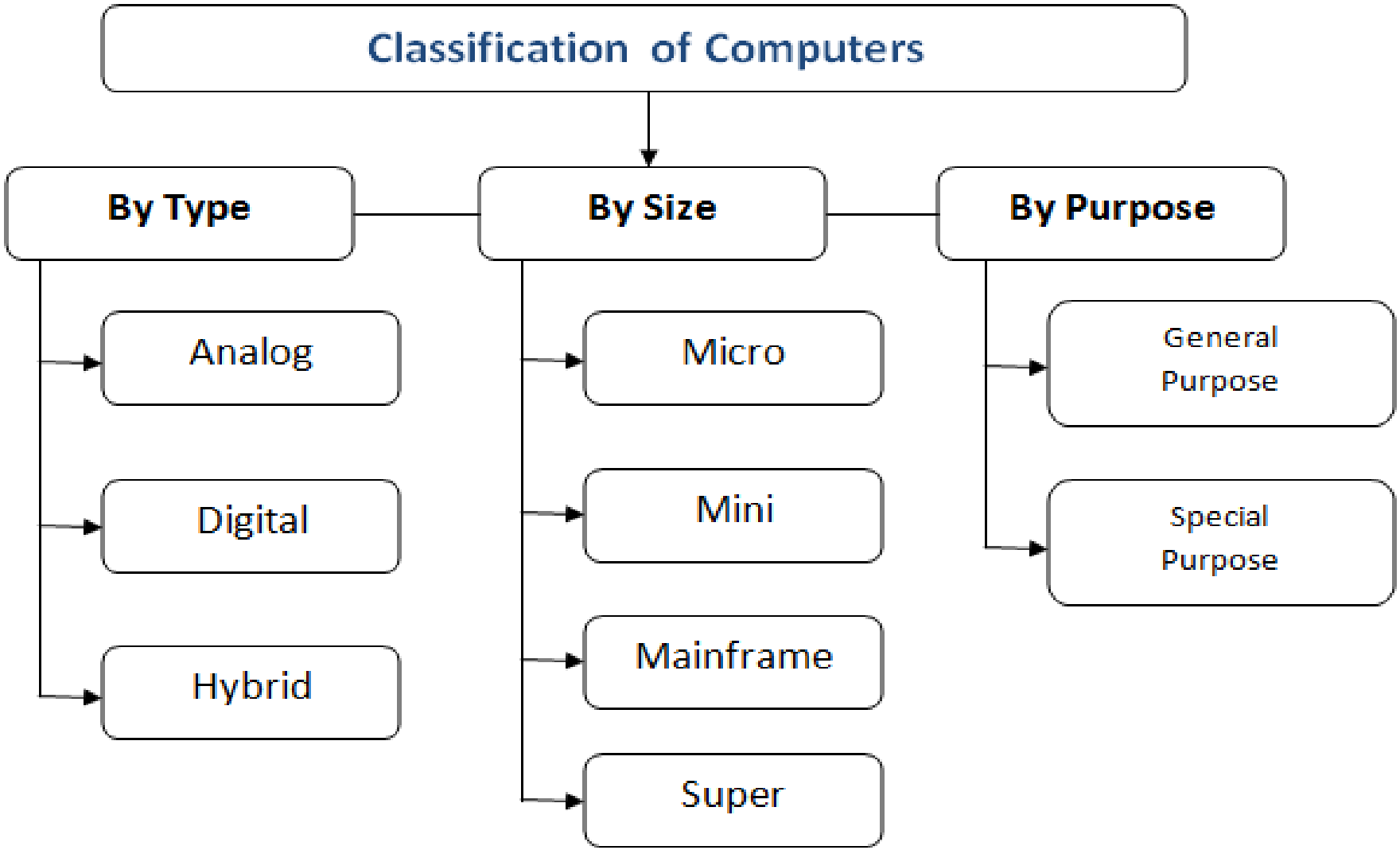
Mind Maps/Tree structure

- Using the mind-mapping / tree structure technique, you have:
  - Developed a search strategy through:
    - Understanding / defining your information need
    - Developed and refined your understanding of the topic or information need
    - Understood the bigger picture & how to narrow down to a specific focus area
    - Used visualisation tools to map the information landscape

Mind Map example: Computer



Tree Structure example: Classification of computers



Individual / Pair Activity

Topic: "Different types of a computer"

- Think of a 'real work-related scenario' where you would be looking for specific information
- Define your information needs
- Create a mind-map of the related terms
- Begin to 'cluster' your concepts / terms
- Create a search table & begin to search for the information

How to evaluate websites

Steps to evaluate websites

1) Open the site
2) Skim read
3) Look for the answer to your question
4) Consider the credibility of the author or website
   - Domain
   - Author information
   - Design
   - Sources
5) Consider the purpose of the site
6) Look for the date

- Don’t forget to **Crosscheck** information

Professional Learning Networks - PLNs

Objectives

By the end of the unit, students would be able to;

- describe PLN
- site examples of PLN
- list the stages of PLN
- state at least three ways PLNs helps teachers

After watching the video, answer the following questions.

- What Is A PLN
- Share your thoughts on “lurking”. What are the pros and cons of this approach?
- What do you think PLN stands for?
- Explain why it’s important to be a connected educator and how a PLN can help you.

Professional Learning Networks - PLNs

- A PLN is one in which participants in a professional community learn together
  - Any group of people sharing the same profession or interests that share ideas
  - Your department is an example of a PLN

- PLNs enable teachers and student teachers access to a wide range of experts and communities to support their professional learning.

Professional Learning Networks – PLNs cont…

- **P** – It is building professional relationships with teachers, university professors and experts around the world. No matter your location in the world, there is always someone else to answer questions, and share their expertise.

Professional Learning Networks – PLNs cont…

- **L –** It is about sharing ideas and resources, collaboration, and learning. We share our learning, ideas and expertise in different ways; using different media and tools.

- **N –** It is a global learning network, enabling people to tap into and share diverse, global perspectives on teaching strategies, educational issues, and technologies.

Professional Learning Networks – PLNs cont…

- The internet allows us to form PLNs with more people and much more easily
  - Why write a letter when you can email?
  - Why email when you can text/twitter?

The stages of PLN

1. Lurking/Skimming
2. Asking for help/opinions
3. Giving help/opinions
4. Starting something (group/discussion)
5. Joining every social network possible
6. Finding the right balance

PLNs & ICTs

PLNs can be facilitated through the use of a range of ICT tools

- Professional learning communities and websites
- **Social networking** sites (Facebook, Twitter, LinkedIn),
- **Social bookmarking** tools (Diigo, Delicious),
- Wikis (wetpaint, Wikispaces)
  - **NB. Pick one username, use the same email, and a consistent password for all of your PLN sites**

Social Networking - Twitter

- Twitter is a popular resource for educators who want to connect with each other professionally
- Twitter allows you to
  - ‘follow’ professional communities and networks that you are interested in
  - and to be ‘followed’ by them.
- Stimulating discussions, new resources, and an ongoing supportive network.
- You just have to know where to look.

Facebook

Social networking site that not only allows people to keep up with family and friends but also connect and engage with professionals. The Facebook for Education page provides information on how educators can best use Facebook as a resource. Other groups worth following to strengthen a PLN include Edutopia and #EdChat. Each customizable page or group provides a variety of learning opportunities and growth options for educators.

LinkedIn

- LinkedIn is currently the world's biggest professional network. They boast more than 400 million members in 200 countries and territories worldwide. They connect professionals everywhere in every field of expertise. It gives you access to people, opportunities, news, and insights to help you grow your success. Teachers adore LinkedIn because of its scope of community.

Diigo – Social Bookmarking Site

Social bookmarking is a method for storing, organizing, and sharing bookmarks online.

- Diigo is a free social bookmarking tool that allows users to share online resources like websites and web tools in a private or public group format. There are lots of different groups on Diigo, many for professional and educational use. Educators can even join groups and receive email updates when new bookmarks are added.

A place where you can store all your bookmarks, pictures, and notes too. Teachers use tags to classify and your school, district, department, class could set up a tag to collect all of your finds. You can install a toolbar to make it easy to maintain and share a single list of bookmarks from any computer

EdWeb.net

- EdWeb.net is a feature-rich professional learning network specifically for educators and other leaders of education innovation. Its members are teachers, faculty, administrators, and librarians at K–12 schools and post-secondary institutions. It offers some fantastic personal learning network features and noteworthy free professional learning programs. They even offer personal training and support for educators embarking on edtech adventures.

Blogs

Incredible sources of information that allow educators to reflect, share opinions, and discuss various topics. This is a common medium to discover best practices and examples of innovation as well as learn from professional experiences of both novice and veteran educators. Common blogging applications include Blogger and WordPress.

Wikis

Collaborative websites that provide registered users with the ability to create and edit any number of interlinked web pages. Wikis encourage information sharing and collaborative learning. Educators can view and join some exemplary wiki models at Educational Wikis.

Digital Discussion Forums

Consist of communities of educators interested in similar topics. One of the most popular sites is called Ning, where educators can create or join specific communities. Ning sites offer a range of learning and growth options such as discussion forums, event postings, messaging, news articles, chat features, groups, and videos. Popular educational Ning sites include The Educator's PLN, Classroom 2.0 and Ning in Education. Other fantastic digital discussion forums are ASCD Edge (you must be a member of ASCD to join) and edWeb.net.

Many Other Ways to Connect…

- Curriki
  - http://www.curriki.org
  - Share lesson plans
- Platform/Software specific discussions
  - http://www.moodle.org

Five Steps to building your PLN via Twitter

1. Join

- Sign up for twitter.com and create a username.
- Username should not be too long
- Complete your bio so people know who you are, and add an image.

2. Follow

- There are thousands of teachers around the world on Twitter.
- Once you have a few people to follow, look at who they are following and you will start to build a PLN.

Five Steps to building your PLN via Twitter cont…

3. Lurk

- You'll need to spend some time checking out the streams of tweets and getting hang of Tweeting, Retweeting, Direct messaging and Hashtags

Five Steps to building your PLN via Twitter cont…

4. Contribute

- The more you put in, the more you get out.
- Make sure you
  - Reply people
  - Retweet tweets
  - Ask questions
  - Strike up conversations

Five Steps to building your PLN via Twitter cont…

5. Stick with it!

- Check on Twitter daily for a month before you make decisions about whether it is for you
- It is about rapports with people and your professional world will be so enlightened.

Blogging

A blog is a way of sharing your knowledge with the world by writing regularly about your ideas in a particular area.

Steps

- Decide what you are going to blog about
- Choose a domain
- Decide on the blogging platform
- Start your blog
- Design your blog
- Start blogging

How can PLNs help teachers?

- Professional development – learn from content-area specialists and educators through blogs, etc.
- Locate unlimited resources for your classroom, such as free websites and software; (OER Commons Resources)
- Get lesson plan ideas from master teachers.
- Learn about new technology and how to integrate it into your teaching.
- Find collaborative solutions and share ideas, give their opinions and add their suggestions.
- Find interesting links to education news and learn latest trends in education.
- Collaborate globally on projects and make international connections.
- 24/7 learning offers the flexibility to learn and connect at a time that suits you.
- You can explore your own interests, needs, and passions.

Tips for PLNS

- Keep the spirit of collaboration as your driving force.
- Join an online community.
- Become a beacon of light.
- Don’t be afraid to ask questions. Be an active participant.
- Remember to be polite and acknowledge contributions to the rightful owner.
- Designate a professional and personal account.

Assignment

1.Investigate & explore some online Professional Learning Networks

2.Based on your experience in (1) above design and develop your own Professional learning network (Twitter, Blog, LinkedIn Academia etc) and share with professionals in your learning community.

- “It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is most adaptable to change”

Charles Darwin

Using Instructional Software in Teaching and Learning

Objectives

By the end of the unit, students should be able to;

- Discuss the following instructional software:
  - Drill-and-practice
  - Tutorials
  - Simulations
  - Educational/Instructional games
  - Problem-Solving courseware
- Describe any five qualities of instructional software

Examples

- Mathematics (http://www.aplusmath.com)
- Languages
- Typing (such as Mavis Beacon)
- Vocabulary
- Music

A create your own drill and practice website, http://www.quizlet.com, allows teachers (or students) to create their own drill and practice items, which can include math facts, vocabulary, subject-specific content,

Principles in designing a good instructional software package

Required Instructional Design and Pedagogy

- Appropriate teaching strategy, based on best-known methods
- Presentations contains nothing that misleads or confuses students
- Comments that are not abusive or insulting
- Readability at an appropriate level for students
- Graphics that are not distracting to learners.

Required for Content

- No grammar, spelling, or punctuation errors on the screen
- Accurate, up-to date content
- No racial or gender stereotypes
- Social characteristics exhibiting sensitivity to moral values

Required for User Flexibility

- User has some control of movement within the program
- User can turn off sound, if desired

Required Technical Soundness

- Program loads consistently, without error
- Program does not break, no matter what the student enters
- Program does what the screen says it should do

Optional Student Use Criteria

- Student ease of use
- Required keys
- Input devices
- Directions
- Supportive materials
- Optional assistance
- Optional directions
- Creativity
- Summary feedback

Optional Teacher Use Criteria

- Teacher's ease of use
- Management
- Teacher manuals
- Ease of integration
- Teacher assistance
- Adaptability

Optional Presentation Criteria

- Graphics features
- Screen layout
- Speech capabilities
- Required peripherals

Optional Technical Criteria

- Response Judging
- Timing
- Portability
- Compatibility
- Technical Manuals

What is a drill-and-practice?

- A drill program provides practice of materials already learned, in order to strengthen or maintain rote knowledge, such as foreign language vocabulary or arithmetic facts.

Cont…

- The practice part of drill-and-practice programs involves using computers to provide a means of learning processes, procedures and skills, e.g. in science laboratories learners learn procedures for titration of acids.
- Much of what is taught requires practice to promote proficiency and fluency. In general, drills are most effective when the nature of the responses are brief and can be produced easily.

Cont…

- Drills provide an opportunity to:
  - establish that learners are able to perform target skills
  - provide feedback regarding their performance
  - remediate those skills that learners do not perform well.

Cont…

- Reasons for using drill-and-practice:
  - Immediately informing the learner whether each of his/her responses were correct/incorrect
  - Keeping of accurate record of missed items for later presentation
  - Presenting additional practice when needed
  - Adjusting the speed of presentation when it is regarded as important

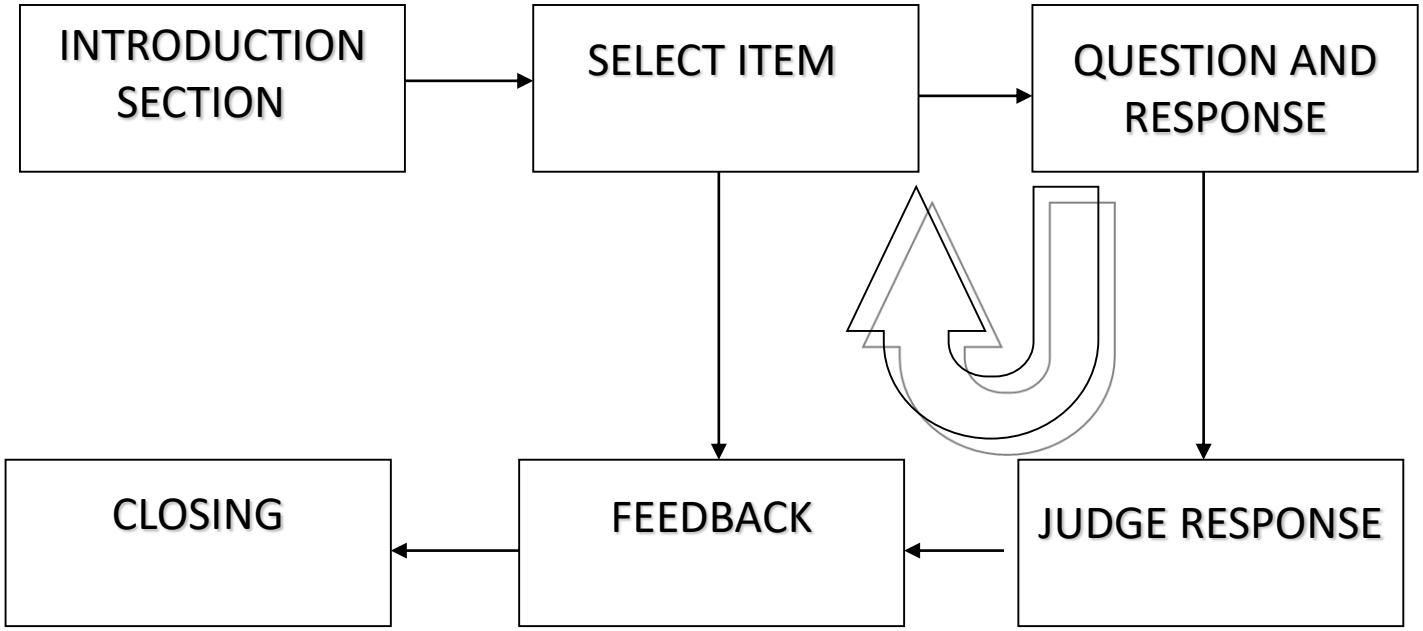
Cont…

- Presenting the information to be learned in a manner that will make it easier to remember
- Computers offer many ways for altering traditional drill formats. The sound, colour, animation and other capabilities of the computer may add value to drills
- Teaching of certain memory strategies such as mnemonic devices may be undertaken with computer-based drills

Basic drill procedures

- Drills usually start off with an introductory section, followed by a cycle which is repeated many times. Each time the cycle is repeated the following actions generally take place:
  - An item is selected
  - The item is displayed
  - The learner responds
  - The program judges the response
  - The learner receives feedback about the response

Cont…


INTRODUCTION SECTION
SELECT ITEM
QUESTION AND RESPONSE
CLOSING
FEEDBACK
JUDGE RESPONSE

Cont…

- Some drills select items randomly while others select them in a specific order. After a number of items the program terminates. Although most drills follow this basic procedure, there are many variations.
- Some drills terminate after:
  - a set number of items, e.g. hundred items
  - a set period, e.g. 15 minutes
  - a learner's performance reaches an acceptable level of quality, e.g. speed/accuracy.

Drill and Practice Activities

- The well-designed drill and practice programs should have the following elements:

1. Control over the presentation rate.
2. Appropriate feedback for correct answers.
3. Better reinforcement for correct answers.

- Most basic drill and practice functions are often described as a *flashcard* queue.

Flashcard queuing

- A queue is an ordered list of items which determines ahead the order in which items will be presented. This is determined by past performance of learners.

1. **Flashcard queuing**
   - Similar to traditional flashcards techniques (Salisbury's technique)
   - Two / three pools are created when learners respond to the items either:
     - consistently correct
     - incorrect and thereafter correct
     - consistently incorrect.

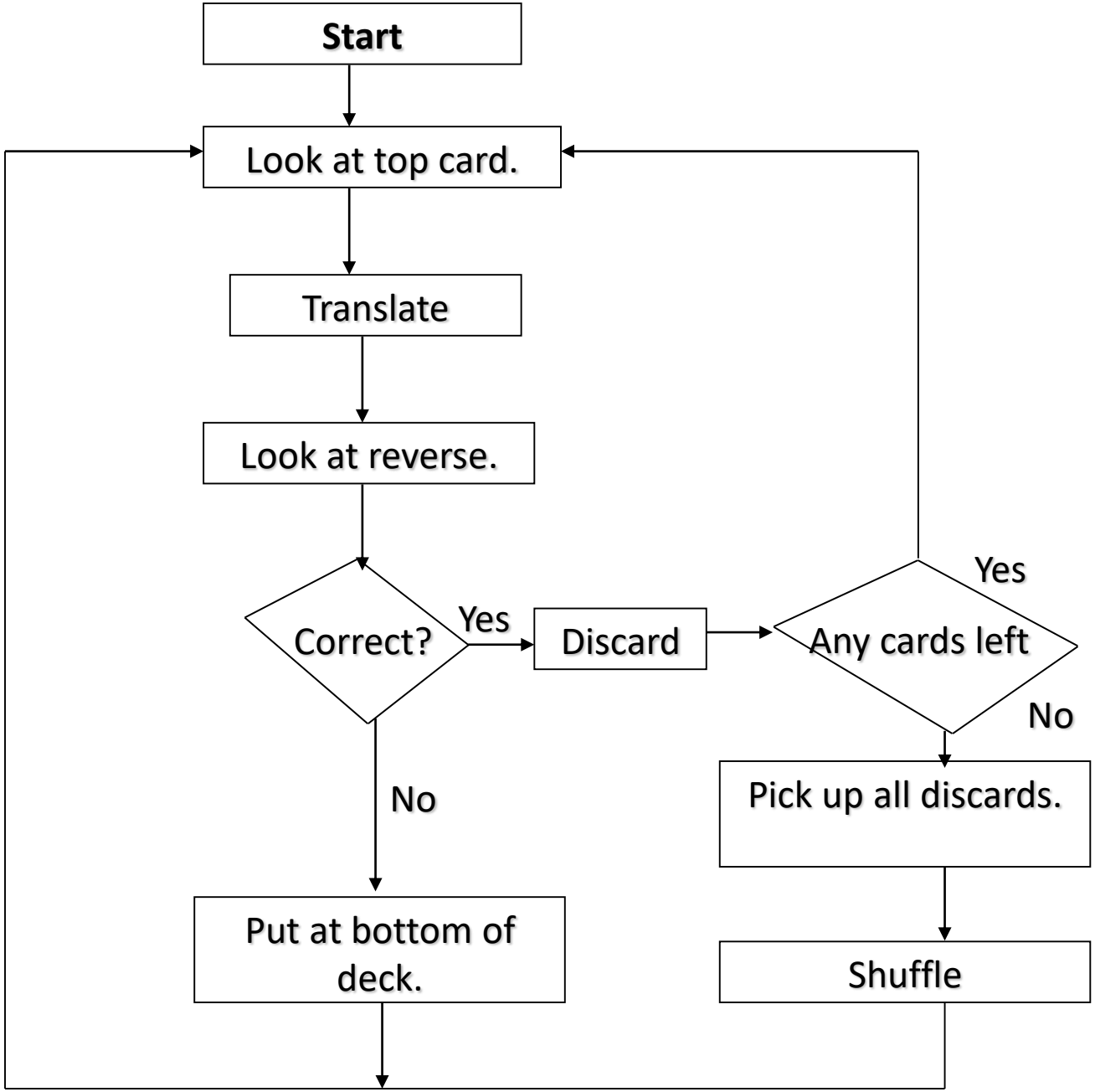
Cont…

Example of Flash card queuing,

- If you have a deck of flashcards with Spanish words on one side and English translations on the other.
- First, you look at the top card and translate it. You then look at the other side and, if correct, discard it from the deck. If you are wrong, you put it at the bottom of the deck so it shows up again.

Cont…

- When all cards are discarded, you shuffle them and begin again.
- You continue doing this until you feel comfortable with all the words. Perhaps you will continue until you get through the entire deck of cards without error.


Start
Look at top card.
Translate
Look at reverse.
Correct?
Yes
Discard
Any cards left
Yes
No
No
Pick up all discards.
Put at bottom of deck.
Shuffle

Tutorial Activities

- Tutorials give instruction without the teacher. Good tutorials include a practice section with immediate feedback to check comprehension, provide user-control, cover content adequately, and allow students to answer appropriately (Roblyer & Doering, 2013). For example,

https://www.khanacademy.org/

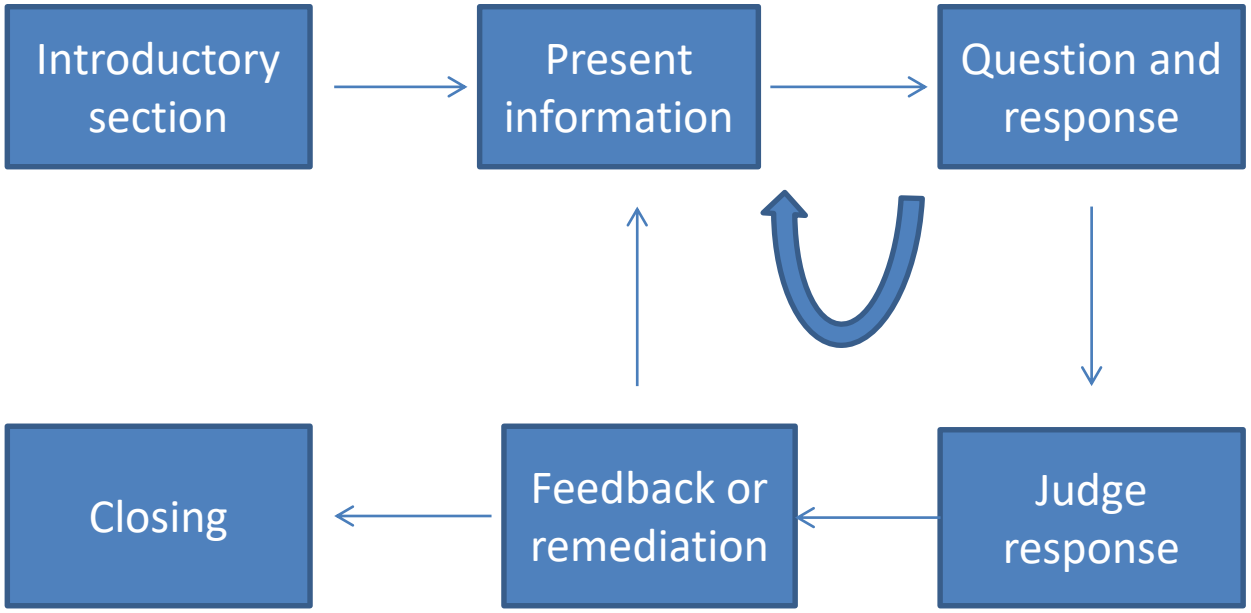
Cont…

- Tutorials (teacher-directed methods) deliver traditional instruction in skills rather than letting students create learning experiences through generative exercises and project development.
- *Tutorials in Teaching:*

  1. Self-paced reviews of instruction
  2. An alternative learning strategy.
  3. Permit instruction when teachers are unavailable.

Structure and sequence of a tutorial programme

- All tutorial programmes aim to satisfy two key things:
  - i. Information is presented or skills are modelled
  - ii. The learner is guided through initial use of the information or skills.



Introduction of a tutorial

- Apart from the title pages and directions, the introduction of Tutorial programmes must have 3 important areas to look at:

1. Presentation of objectives
2. Stimulating prior objectives
3. pretesting

Questions and responses

- A tutorial that presents information without interaction with the learner cannot be successful. Here, the most common method of interaction is to pose questions that the learner must answer.
- They keep the learner attentive to the programme, provide practice, encourage deeper processing and assess how well the learner remembers and understands information.
- Questions provide a basis for programme sequencing, i.e. a programme can change what is presented next based on a learner's response.

Frequency of questions and the four-part cycle

- Questions (or other interactions requiring thoughtful response) should occur frequently.
- Sequences of information presentation should be kept short.
- The learner reads or inspects small amounts of information and then answers questions thus enhancing comprehension and recall.
- **The four-part cycle** (*present information*, *question and response, judge response, feedback or remediation*) **should occur frequently.**

Judgement of responses

- Judging is the process of evaluating a response to give feedback, to make programme sequence decisions and to store performance data.
- Types of judgement
  - The response is correct
  - The response contains an expected error
  - The response contains an unexpected error
  - The response is partially correct i.e. it contains some but not all of the correct information
  - The response is neither right nor wrong.eg. names

Feedback about responses

- Feedback is the reaction of a program to a learner’s response and may take many forms.
- This includes text messages and graphic illustrations.
- The ultimate aim is to inform the learner about the correctness of a response.
- Providing reinforcement for the learner should follow correct responses.
- Providing correction with the purpose of improving future performance , should follow incorrect responses.

The Elements of Well-Designed Tutorial Programs

- Tutorials are geared toward learners who can read fairly well and usually older students or adults.
  - Extensive interactivity.
  - Thorough user control.
  - Appropriate and comprehensive teaching sequences.
  - Adequate answer-judging and feedback capabilities.

Simulation Activities

- A simulation is a computerized model of some phenomenon or activity designed to teach how a certain task or situation works.
- By duplication real world situations, learners are not only motivated, but learn by interacting with simulations in a manner similar to the way they would react to the real world.

Types of Simulations

There are two types of simulation:

1. Those that teach about something:

- Physical simulations allow users to manipulate things or a process on the screen;
- Iterative simulations where processes can be sped up or slowed down so the user can watch the events unfold.

2. Those that teach how to do something.

- Procedural simulation which teach a sequence of steps to perform certain procedures;
- Situational simulations provide users with hypothetical problems or situations that they can react to.

Characteristics of simulations

- A simulation usually consists of three sections, namely,
  - the introduction
  - the presentations and interactions
  - the completion of the simulation
- After the introduction, a cycle usually follows, consisting of:
  - the presenting of a scene
  - the request to the learner to react
  - the learner reaction
  - the changing of the computer's response according to the learner's action.

Using Simulations in Teaching

- Enhances safety
- Experiences not readily available in reality
- Modifies instructional time frames
- Controls level of complexity
- Introduction of new topics
- Motivation
- Simulates instruction
- Saves money
- Simulates the not possible

Educational Games

- An educational game, one designed for learning, is a subset of both play and fun. It is a melding of educational content, learning principles, and computer games (Prensky, 2001).

Teaching with Games:

  - Replacement for worksheets and exercises
  - Foster cooperation and group work
  - As a reward

Types of Games

- Adventure
- Business
- Combat
- Logic
- Word

General Factors in Games

- Seven important factors are considered in games. The more these general factors are present, the more game-like an activity is considered to be.
- The factors include:

i. Goals
ii. Rules
iii. Competition
iv. Challenge
v. Fantasy
vi. Safety
vii. entertainment

Pitfalls Associated with Creating and Using Games

- Some of the pitfalls associated with educational games are:
  - Difficulty of making games that are fun
  - Conflict between educational goals and the characteristics of games
  - Efficiency of learning in games
  - Disagreement about whether games are intrinsic or extrinsic motivators
  - Educators' negative beliefs about games

Problem-Solving Courseware

- Synonyms term for *problem-solving* include: critical thinking, thinking skills, higher level thinking, higher-order cognitive outcomes, reasoning, use of logic, decision making, and inference skills.
- Mayes(1992)- “ teaching-sequenced planning to solve problems to high ability learners could interfere with their own effective processing”

Six Steps Help Teachers Integrate P-S Courseware

1. Identify problem-solving skills or general capabilities to build.
2. Decide on a series of activities that would help teach the desired skills.
3. Examine courseware to locate materials that closely match the desired abilities.

Cont…

4. Determine where the courseware fits into the teaching sequence.
5. Demonstrate the courseware and the steps to follow in solving problems.
6. Build in transfer activities and make students aware of the skills they are using in the courseware.

Seven Steps for Integrating Problem-Solving Courseware

1. Allow students sufficient time to explore and interact with the software.

2. Vary the amount of direction and assistance depending on the needs of each student.

Cont…

3. Promote a “ reflective learning environment.”
4. Stress thinking processes rather than correct answers.
5. Point out the relationship of courseware skills and activities to other kinds of problem solving.

Cont…

6. Let students work together in pairs or small group.

7. If assessments are done, use alternatives to traditional paper-and pencil tests.

MAKING AN EFFECTIVE POWERPOINT PRESENTATION

Objectives

By the end of the unit, students should be able to:

- Define effective presentation.
- Describe the stages in planning a presentation.
- List any three common mistakes in preparing a presentation.
- List any four types of visual aids.
- Define PowerPoint presentation.
- State any five strategies for making effective presentations.

What is an effective presentation?

An effective presentation makes the best use of the relationship between the presenter (teacher) and the audience (students).

Planning the Presentation

- Know your audience
- Objectives
- Content
- Resources
- Strategies

Common Presentation Mistakes

- Failing to master your topic
- Getting another person to prepare the presentation for you
- Stacking in too much information
- Choosing a poor design template or design theme
- Using unusual colour combination

CONT…

- Poor font choices
  - » Easy to read fonts are Arial or Times New Roman
- Using extraneous photos and graphs
- Using too many slides in one presentation
- Using varying animations in one presentation
- Hardware glitches (Projector or computer fail you)

Visual aids

- PowerPoint presentations can supplement the use of other visual aids in order to make it more effective.

Cont…

- **White or black board-** White or black boards can be very useful to help explain the sequence of ideas or routines.
- **Paper handouts-** Use a handout if your information is too detailed to fit on a slide or if you want your audience to have a full record of your findings.
- **Flip chart-** A flip chart is a large pad of paper on a stand. It is a very useful and flexible way of recording information during your presentation

Cont…

- **Video-** Video gives you a chance to show stimulating visual information.
- **Artefacts or props-** Sometimes it can be very useful to use artefacts or props when making a presentation

Strategies for making effective presentations

1. Include only essential information and use key phrases. Try not to have more than three bullets per slide.
2. Limit the number of slides. Use the one-minute-per-slide rule as a guide for determining how many slides to include.

Cont…

3. Follow a logical order of presenting information. Begin with a roadmap of the presentation (what you will cover).

4. Lay out each slide in such a way that it is easy to follow how ideas relate to each other. Titles should be on top.

Cont…

5. Avoid using fancy fonts as they are often difficult to read. Use no more than two font styles and use large font sizes (not less than 24 points).

6. Use a light colored background and dark colored text.

NB. Check next slide to see the background and text colours to avoid.

RED/BLUE CONFLICT

Red letters on blue background creates “flicker effect”

Blue letters on red background just as bad

LOW CONTRAST

White on yellow

Yellow on white

Black on blue

Blue on black

Cont…

7. Choose slide designs that are appropriate for the audience.

8. Use photos, charts, and graphs, and/or a video where appropriate.

9. Limit the use of punctuation and avoid using capital letters (except for the first letter of each line).

Cont…

10. Avoid excessive use of slide transitions and animations, as they can distract from the main message.

11. Make sure your presentation can run on any computer. Test it before the presentation session.

PRESENTATION SOFTWARE

- An application that lets you create, print, and deliver presentations.
- A computer tool for creating on-screen multimedia presentations.
- It is a combination of slides, handouts, notes, and outlines all in one file.
- These programs can either supplement or replace the use of older visual aid technology.
  - Pamphlets
  - Chalkboard
  - Overhead transparencies

Functions

- An editor that allows text to be inserted and formatted.
- A method for inserting and manipulating graphic images.
- Slide show system to display content.

EXAMPLES OF PRESENTATION SOFTWARE

- Microsoft PowerPoint
- Apple’s Keynote
- MagicPoint
- Kpresenter
- Lotus Freelance
- Corel Presentations

MICROSOFT POWERPOINT

- A powerful presentation software program that allows you to create slides, handouts, notes and outlines that accompany an oral delivery of the topic.
  - Slide: This is what PowerPoint calls each screen of information.

Strategies to developing an effective presentation

- Add Text
- Add Picture
- Add Graphic
- Add Transition
- Add Animation
- Create Hyperlinks
- Add Video

Text

Text on PowerPoint slides, needs to be formatted to be easily visible to all audience members.

Working with images

- Images are used in presentations for reference, emphasis, or explanation.

- Placement is also important. Place images where they will make sense.

Clip art

- Clip Art consists of ready-made illustrations, movies or sound clips that can be used to enhance a presentation.

Applying transitions

- A transition is a special effect that determines how a slide appears as it enters or leaves the screen.

- Adding transitions between slides gives your presentation a smooth and consistent look. But, use sparingly.

Animated bullet points

To increase suspense in your presentation, and to keep your audience focused on the current issue you can introduce points on a slide one at a time.

Hyperlink

- The fastest way to create a basic web hyperlink on a PowerPoint slide is to press Enter after you type the address of an existing webpage (such as http://www.ucc.edu.gh).

Video

- YouTube is the only streaming video site supported in PowerPoint (only versions 2010, 2013, 2016 and newer).
- In previous versions, YouTube videos were added with the use of a hyperlink, that linked to the video on YouTube.

Activity

- When adding a video to a presentation, is it better to embed or provide a hyperlink? Discuss.