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PROPOSED COURSEWARE FOR INSTRUCTIONAL DELIVERY

AL-HIKMAH UNIVERSITY, ILORIN, NIGERIA

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COURSE TITLE: ICT and Education  
COURSE CODE: EDU 404 COURSE CREDIT: 2 COURSE STATUS: C

LECTURER’S NAME: Dr. Hameed Olalekan BOLAJIDEPARTMENT: Department of Science Education, Faculty of Education, Al-Hikmah University, Ilorin, Nigeria

OFFICE ROOM NUMBER: 231 FLOOR: Three

OFFICE ADDRESS: Department of Science Education, Faculty of Education, Igbaja Campus

OFFICIAL EMAIL: [hobolaji@alhikmah.edu.ng](mailto:hobolaji@alhikmah.edu.ng) ALTERNATIVE EMAIL: lalekanbolaji@gmail.com

CONTACT MOBILE NUMBER(S): 08034862624

CONSULTATION HOURS: 12pm-1:30pm

CONSULTATION DAYS: Mondays and Wednesdays

COURSE DETAILS: This course would focus the attention of learner to the design and development of instructional media to supplement teaching and learning process.

COURSE CONTENT: [Components of the AECT’s 2008 Definition](#_Toc468790496); [Instructional Media and Its Classification](#_Toc468790497); [Importance of Instructional Media](#_Toc468790498); [Communication Process in the Classroom](#_Toc468790499); [Classification and Models of Communication Process](#_Toc468790500); [Barriers to Effective Communication Process in the Classroom](#_Toc468790501); [Instructional System Design (ISD) Process](#_Toc468790502); [Quality Assurance for Multimedia Learning Materials (QAMLM)](#_Toc468790503); [Selection Versus Development of Media Presentations](#_Toc468790504); [Integration Models for Technology in Teaching](#_Toc468790505); [Technologies for Classroom Instructional Delivery](#_Toc468790506); [Evaluation Processes for Instructional Technologies](#_Toc468790507); [Definition and Types of Evaluation Process](#_Toc468790508); [Technology Evaluation Model – Kirkpatrick](#_Toc468790509); [Social Media & Learning Management System for Learners and Educators](#_Toc468790514); [Social Media Context in Educational Processes](#_Toc468790515); [Learning Management Systems for Instructional delivery](#_Toc468790516); [Strategies for LMS Successful Implementation](#_Toc468790517); [Change Process for Implementing Instructional Technologies in Higher Education](#_Toc468790518)

COURSE DESCRIPTION: The course introduces students to principles and practice of instructional design and development. The course will deal with the definitions of basic concepts and processes in information and communication technology with regard to education. Attention will also be focused on the forms of instructional technologies and other basic terminologies in technology integration.

COURSE OBJECTIVES: At the end of this course, students are expected to:

1. display high level skill in the design, production, selection, improvisation and evaluation of instructional and educational media, including those associated with the print and broadcasting (electronic) media;
2. design and package educational programmes for a wide category of target audience; in-school and non-face-to-face, and for different purposes;
3. adopt the required skills in the research, improvisation and management associated with instructional and educational media, methods and modes;
4. exhibit competency in the manipulation of instructional and educational hardware and software to achieve maximum result for a wide variety of target audience;
5. appreciate the combined use of the hand, head and heart in creativity as a mark of self-reliance and dignity of labour; and
6. develop ability to investigate through research, observations and experimentation, the various areas associated with instructional media design, production, utilization and their effects on performance and goal attainment.

COURSE REQUIREMENTS: Students are expected to be actively involved in classroom activities through participation, submission of assignments, asking and answering question in the lecture room, etc. Class attendance is mandatory and it will be taken at each lecture. Any student who does not meet 75% attendance would be disqualified from writing examination. Each student would be subjected to class work and practice. In addition, students will be subjected to the end of course examination using Computer Based Test of 100 multiple choice items where students is more than hundred.

GRADING METHOD: The grading system for this course would be:

Continuous Assessment

Attendance ----- 10marks

Assignment ----- 15marks

Test ----- 15marks

Examination ----- 60marks

Total ----- 100marks

INSTRUCTIONAL STRATEGY: combination of lecture and teaching methods with the use of relevant and appropriate instructional materials

Learning Section 1: [Components of the AECT’s 2008 Definition](#_Toc468790496)

Learning Objective(s): At the end of this class, students should be able to identify the major terminologies in the definition of Educational Technology. Also, explain the essence of facilitating learning in students

Topic Outline: Definition of Educational Technology. Identification of basic terms like facilitating learning, improving performance, creating, using, managing, appropriate technological resources and processes.

Lecture Note

Various definitions of Educational Technology have been stated as the field  
shows the quality of dynamism as an evolving field. Each of these definitions was  
based on the practices engaged on by the then educational technologist raging from  
photographic through audio to audio-visual communications. Today, educational  
technology is more than the aforementioned but incorporate the revolution of  
information and communication technology (ICT) into the field of education.  
Conceptions of educational technology have been evolving as long as the field has,  
and they continue to evolve. Therefore today’s conception is a temporary one, a  
snapshot in time. In today’s conception, Educational Technology can be defined from  
the perspective of abstract concept or as a field of practice but let’s first define from  
the perspective of concept:

*Educational Technology is the study and ethical practice of facilitating learning and  
improving performance by creating, using, and managing appropriate technological  
processes and resources. (AECT, 2008)*

Each of the components making up this definition was briefly explained in the next section. i.e. study, ethical practice, facilitating, learning, improving, performance, creating, using, managing, appropriate, technological, processes and resources.

The ‘study’ component constitutes continual knowledge construction and refinement  
through research and reflective practice which refer to gathering information and  
analyzing beyond the traditional conceptions of research. ‘Ethical Practice’ borders on  
judicious use of media and on respect for intellectual property with guided principle  
as basis for practicing educational technology. ‘Facilitating’ is projecting learner’s  
ownership with regard to the role of technology in being facilitative rather than  
controlling learning, giving more attention to learning environment. ‘Learning’ in this  
context is view from the point of being productive, active-use and deep learning as a  
demonstration of achieving the goals and objectives of knowledge understanding and  
retention. ‘Improving’ connotes efficiency and effectiveness with accomplishment of  
goal oriented learning in consideration with time, effort and expense dissipated while  
learning. ‘Performance’ simply refers to learner’s ability to use and apply the  
capabilities or knowledge gained in the process of learning. ‘Creating’ from this  
definition is an attempt to give credence to factors that will guide in generating a  
conducive learning environment whether in formal or informal settings. ‘Using’  
connotes bringing the learners in contact with learning conditions and resources  
necessary to facilitate knowledge. ‘Managing’ refers to carrying out managerial  
activities or functions involving personnel and technological products involve in the  
process of learning. ‘Appropriate’ connotes applying to both processes and resources  
with respect to suitability and compatibility in consonant to intended purposes.  
‘Technological’ is included to justify the systematic application of scientific or other  
organized knowledge to practical task. ‘Process’ in this definition is meant to explain  
the specialized processes employed to design, develop and produce learning resources in instructional development process. ‘Resources’ is the last component of this  
definition and it attempt to identify the congruent of educational technology which  
include people, tools, technologies and materials designed to assist learner.  
The expansion of the above definition as it relates to information and communication  
technology (ICT) implies that Educational Technology is the study and ethical  
practice of facilitating e-learning process and improving performance by creating,  
using and managing appropriate technological processes and resources. The term  
educational technology is often associated with, and encompasses, instructional  
theory and learning theory. While instructional technology is "the theory and practice  
of design, development, utilization, management, and evaluation of processes and  
resources for learning". According to the Association for Educational  
Communications and Technology (AECT) Definitions and Terminology Committee,  
educational technology includes other systems used in the process of developing  
human capability. Educational Technology includes, but is not limited to, software,  
hardware, as well as internet applications, such as wikis and blogs, and activities. In  
conclusion, the study of educational technology prepare individuals by helping them  
acquire a deeper understanding and mastery of: learning resources (messages, people,  
materials, devices, techniques and setting); processes for analyzing and devising  
solutions to those problems through research, theory, design, production, evaluation,  
utilization; and processes involved in organization and personnel management. The  
focus is on effective processes to facilitate learning using technologies and  
understanding the impacts of technology on learners and organization

Study Questions:

1. Define Educational Technology.
2. Explain the importance of facilitating learning in student
3. What is the major implication of creating in the definition of Educational Technology?

Reference Materials:

1. Reading List
2. Web Directory
3. YouTube Directory

Learning Section 2: Instructional Media Classification and Its Importance

Learning Objective(s): At the end of this lecture, student is expected to classify instructional media based on sense of organ and itemize instructional resources that can be used for instructional delivery.

Topic Outline: Definition of instructional media, classification of instructional media, importance of instructional media

Lecture Note

Instructional media can be defined as whatever resources intended to help facilitate  
effective learning and simplify the art of teaching by supplementing the engagement  
of teacher’s role in the effort to deliver instructions in the classroom in the bid to  
attain the stated instructional objectives of a particular lesson delivery. Instructional  
media covers whatever the teacher uses to involve all the five senses of sight, hearing,  
touch, smell and taste while presenting lessons in the classroom. It can broadly be as  
any material, equipment or events that establish the condition of promoting student’s  
acquisition of knowledge, skills and attitudes. Instructional media are information  
carriers designed specifically to fulfill instructional objectives in a teaching-learning  
situation.

Instructional media includes all the materials and substantial resources that an  
educator might use to implement instruction and facilitate students' achievement of  
instructional objectives. This may include traditional materials such as chalkboards,  
printed materials (handouts, books, worksheets), display boards, charts, slides,  
overheads, real objects and videotape or film, as well as newer materials and methods  
such as computers, real objects or models, DVDs, CD-ROMs, interactive whiteboard,  
the Internet, and interactive video conferencing etc. It facilitates learning or increase  
understanding of material and enhances comprehension of the learners. The common  
objectives of instruction media can be grasping attention, sprouting interest, support  
learning with living examples and visual elaboration, making a learning environment  
in class interesting, and it also helps in turning learning into an enjoying experience.  
There is a wide variety of instructional media which could be profitably and effectively used in classroom learning situation. They could be broadly classified into three group namely visual media, audio-visual media, and audio media.

**Visual Media**: The medium which use sense of vision are called visual media. For example actual objects, models, pictures, charts, maps, flash cards, flannel board, bulletin board, chalkboard, overhead projector, slides etc. Out of these black board and chalk are the commonest ones.

**Audio Media:** The medium that involve the sense of hearing are called Audio media. For example radio, tape recorder, gramophone etc.

**Audio-Visual Media:** The medium which involve the sense of vision as well as hearing are called Audio-Visual media. For example television, projectors, computer, etc. A further classification of instructional media can be based on its method of production and it is significantly categorize under educational media.

**Importance of Instructional Media**

As a rule, educational experiences that involve the learner physically and that  
give concrete examples are retained longer than abstract experiences such as listening  
to a lecture. Instructional media help add elements of reality – for instance, including pictures or highly involved computer simulations in a lecture. Media can be used to support one or more of the following instructional activities:

*Gain Attention*: A picture on the screen, a question on the board, or music playing as students enter the room all serve to get the student’s attention.

*Recall Prerequisites*: Use media to help students recall what they learned in the last class, so that new material can be attached to and built upon it.

*Present Objectives to the Learners***:** Hand out or project the day’s learning objectives.

*Present New Content***:** Not only can media help make new content more memorable, media can also help deliver new content (a text, movie, or video).

*Support Learning through Examples and Visual Elaboration***:** One of the biggest advantages of media is to bring the world into the classroom when it is not possible to take the student into the world.

*Elicit Student Response***:** Present information to students and pose questions to them, getting them involved in answering the questions.

*Provide Feedback***:** Media can be used to provide feedback relating to a test or class exercise.

*Enhance Retention and Transfer***:** Pictures enhance retention. Instructional media help students visualize a lesson and transfer abstract concepts into concrete, easier to remember objects.

*Assess Performance*: Media is an excellent way to pose assessment questions for the class to answer, or students can submit mediated presentations as classroom projects

Study Questions

1. Classify instructional into categories
2. State five importance of instructional media to teaching
3. Explain the difference between print and non-print media
4. List five examples of educational media

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

Learning Section 3: [Classification and Models of Communication Process](#_Toc468790500)

Learning Objective(s): at the end of this lecture, students should be able to explain the concept of communication process in teaching, classify communication models into types and identify the forms of communication process.

Topic Outline: forms of communication process, types of communication process, models of communication process and its examples

Learning Note

Communication is defined as the process by which people interactively create, sustain, and manage meaning out of instruction or information. Models Meanwhile, there are five forms of communication namely intrapersonal, interpersonal, group, public and mass communications.

*Intrapersonal communication* is within oneself and occurs only inside our heads (internal reflective thinking). It is in most triggered by internal or external stimulus.

*Interpersonal Communication* is between people whose lives mutually influence one another and typically occurs in pairs.

*Group Communication* occurs when three or more people communicate to achieve a shared goal.

*Public Communication* is sender focused and typically occurs when one person conveys information to an audience.

*Mass Communication* occurs when messages are sent to large audiences using print or electronic media like television, radio, podcasts, websites, blogs and social media.

Communication models can be categorized as linear, interactive or transactional. The *Linear model* view communication as a one way or linear process (e.g. Laswell), the *Interactive model* provides feedback effect from the receiver to the sender, and finally, the *Transactional model* assert that the elements in communication process are interdependent whereby the communicator can both send and receive message simultaneously. In this wise, each person in communication process act as both sender and receiver of messages.

**Communication Models**

**Shannon-Weaver Communication Model**

In 1947, Claude E. Shannon, a research mathematician working for Bell Labs, created a theory of communication designed to facilitate information transmission over telephone lines. Later, Warren Weaver added the component of feedback to Shannon’s linear model, thus making it, in effect, circular. Although, it was originally intended to be used by engineers dealing with information that was void of meaning. The Shannon-Weaver Model is one of the most popular inter-personal communication models used today.

Within the Shannon-Weaver Model, there are 8 key elements that are required for communication, or information transmission to occur. These elements are:

**Source:** The source of communication is the initiator, or origin, that puts the model into action. It is an individual or group that has a specific reason to begin the communication process. That is, there is a message that they wish another to receive.

**Encoder:** Once the purpose of the source has been decided, there must be a specified format for the message to take. This is what the communication encoder does; it takes the concept that the source wants to send out, and puts it into a suitable format for  
later interpretation.

**Message:** The information, idea, or concept that is being communicated from one end of the model to the other is the message. Most of the time, in human communication, the message contains a distinct meaning. When the model was created, Shannon and Weaver were not concerned whether the message had substance, but rather that it was being transmitted.

**Channel:** It is essential for every meaningful communication that a suitable means to transmit the message be selected. The channel is the route that the message travels on, be it verbal, written, electronic, or otherwise.

**Noise**: It is inevitable that noise may come into play during the communication process. Noise could be considered an interference or distortion that changes the initial message; anything that can misconstrue the message may be noise. Noise can be physical, like actual sound that muffles the message as it is being said, or it can be semantic, like if the vocabulary used within the message is beyond the knowledge spectrum of its recipient. In order for communication to be effective, noise must be reduced.

**Decoder**: Before the message reaches the intended recipient, it must be decoded, or interpreted, from its original form into one that the receiver understands. This is essentially the same interaction as that of source and encoder, only in a reversed sequence.

**Receiver**: In order for communication to be initiated, there must be a second party at the end of the channel the source has used. The receiver takes in the message that the source has sent out.

**Feedback**: For meaningful communication to come to fruition, it is vital that the receiver provides feedback to the source. Feedback relates to the source whether their message has been received, and most importantly, if it has been interpreted accurately. Without feedback, the source would never know if the communication was successful. Ongoing communication is made possible by the cyclical route feedback allows; if more communication between the two parties is necessary, they can follow the model indefinitely

**Lasswell Communication Mode**

Harold Dwight Lasswell, the American political scientist states that a convenient way to describe an act of communication is to answer the following questions:

* Who Says What
* In Which Channel
* To Whom
* With what effect?

This model is about process of communication and its function to society, According  
to Lasswell, there are three functions for communication: Surveillance of the environment, Correlation of components of society, Cultural transmission between generation  
Lasswell model suggests the message flow in a multicultural society with multiple audiences. The flow of message is through various channels, and also this communication model is similar to Aristotle’s communication model. In this model, the communication component who refers the research area called “Control Analysis”; Says what refers to “Content Analysis”; In which channel refers to “Media Analysis”; To Whom refers to “Audience Analysis”; and With What Effect refers to “Effect Analysis”

**Berlo Communication Model**

The Berlo’s model follows the SMCR model. This model is not specific to any particular communication. Berlo’s model lives a number of factors under each of the elements:

**Source**: The source is where the message originates, and it is discuss under the  
following components:

*Communication Skills* – It is the individual’s skill to communicate (ability to read, write, speak, listen etc.)

*Attitudes* – The attitude towards the audience, subject and towards oneself for e.g. for the student the attitude is to learn more and for teachers wants to help teach.

*Knowledge*- The knowledge about the subject one is going to communicate for e.g. whatever the teacher communicates in the class about the subject so having knowledge in what you are communicating. It is not about the general knowledge, but rather it is all about the knowledge of the subject, so it is the familiarity of what you are communicating.

*Social System* – The Social system includes the various aspects in society like values, beliefs, culture, religion and general understanding of society. It is where the communication takes place. For example, class room differs from country to country like behaviors, how we communicate etc. We can communicate only to the extent that the social system allows, so when we communicate, take social system into account.

*Culture*: Culture of the particular society also comes under social system.

**Encoder**: The sender of the message is referred as encoder, so the source is encoding the message here. This can be discussed as follows:

**Message Content** – The beginning to the end of a message comprises its content for e.g. from beginning to end whatever the class teacher speaks in the class is the content  
of the message.

*Elements* – It includes various things like language, gestures, body language etc., so these are all the elements of the particular message. Content is accompanied by some elements.

Study Questions

* 1. Describe three forms of communication process
  2. List two examples of communication models
  3. Classify communication model into types with relevant examples
  4. Explain six major elements of communication process

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

Learning Section 4: [Barriers to Effective Communication Process in the Classroom](#_Toc468790501)

Learning Objective(s): at the end this lecture, student should be able to identify barriers to effective communication in the classroom and provide explanations with relevant examples.

Topic Outline: Factors constituting barriers to communication

Lecture Note

**Barriers to Effective Communication Process in the Classroom**

The following eight barriers can interrupt communication, and problem with any one  
of the components of the communication model can become a barrier to communication.

*Mixed-up Messages* -Effective communication starts with a clear message. Mixed-up messages are a barrier to communication because the sender leaves the receiver unclear about the intent of the sender. Muddled messages have many causes. The sender may be confused in his or her thinking or the message may be little more than a vague

*Stereotyping* - Stereotyping causes us to typify a person, a group, an event or a thing  
on oversimplified conceptions, beliefs, or opinions. Thus, basketball players can be  
stereotyped as tall, green equipment as better than red equipment, football linemen as  
dumb. Stereotyping is a barrier to communication when it causes people to act as if  
they already know the message that is coming from the sender or worse, as if no  
message is necessary because "everybody already knows." Both senders and listeners  
should continuously look for and address thinking, conclusions and actions based on  
stereotypes.

*Wrong Channel*- "Good morning." An oral channel for this message is highly  
appropriate. Writing "GOOD MORNING!" on a chalkboard in the machine shed is less effective than a warm oral greeting. On the other hand, a detailed request to a contractor for construction of a furrowing house should be in writing, i.e., non-oral. A long conversation between a pork producer and a contractor about the furrowing house construction, with neither taking notes, surely will result in confusion and misunderstanding. These simple examples illustrate how the wrong channel can be a barrier to communication.

*Language*- Words are not reality. Words as the sender understands them are combined with the perceptions of those words by the receiver. Language represents only part of the whole. We fill in the rest with perceptions. Trying to understand a foreign language easily demonstrates words not being reality. Each new employee needs to be taught the language of the technicality, and until the language of technicality is learned, it can be as much a barrier to communication as a foreign language.

*Lack of Feedback*- Feedback is the mirror of communication. Feedback mirrors what the sender has sent. Feedback is the receiver sending back to the sender the message as perceived. Without feedback, communication is one-way. Feedback happens in a variety of ways. Asking a person to repeat what has been said, e.g. repeat instruction is a very direct way of getting feedback. Both sender and receiver can play an active role in using feedback to make communication truly two-way.

*Poor Listening Skills*- Listening is difficult. A typical speaker says about 125 words per minute. The typical listener can receive 400-600 words per minute. Thus, about 75 percent of listening time is free time. The free time often sidetracks the listener. The solution is to be an active rather than passive listener. An angry person will not start listening until they have "cooled" down. Telling an angry person to "cool" down often has the opposite effect. Getting angry with an angry person only assures that there are now two people not listening to what the other is saying.

*Interruptions* - The interruptions may be due to something more pressing, rudeness, lack of privacy for discussion, a drop-in visitor, an emergency, or even the curiosity of someone else wanting to know what two other people are saying.

*Physical Distractions*- Physical distractions are the physical things that get in the way of communication. Examples of such things include the telephone, a pick-up truck door, a desk, an uncomfortable meeting place, and noise.

Study Questions

* 1. What is the implication of mixed-up messages in communication process?
  2. List three examples that constitute barriers to classroom communication process
  3. Explain the how physical distraction can impede communication process

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

Learning Section 5: [**Instructional System Design (ISD) Process**](#_Toc468790502)

Learning Objective(s): at the end of this lecture, students should be able to define instructional system design, explain the stages of the generic ISD- ADDIE, and identify the sample task and output

Topic Outline: The concept of design in instruction, types of design, definition of instructional system design, ADDIE in focus

**Lecture Note**

Design process is a problem-solving approach through which problems is been  
identified with analysis carried out on the problem or need. Consequently, designers  
proceed to structure a sequential solution from research and ideas to explore &  
evaluate for optimum result in the application of the solution so devised. Instructional  
Design as a process 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 is the systematic approach to the Analysis, Design,  
Development, Implementation, and Evaluation (ADDIE) of learning materials and  
activities. Instructional design aims for a learner-centered rather than the traditional  
teacher-centered approach to instruction, so that effective learning can take place.

This means that every components of the instruction is governed by the learning outcomes, which have been determined after a thorough analysis of the learners’ needs. These phases sometimes overlap and can be interrelated; however, theyprovide a dynamic, flexible guideline for developing effective and efficient instruction. The ADDIE Model is an iterative instructional design process, where the results of the formative evaluation of each phase may lead the instructional designer back to any previous phase. The end product of one phase is the starting product of the next phase.

*Analysis*: the Analysis phase is the foundation for all other phases of instructional  
design. During this phase, you must define the problem, identify the source of the  
problem and determine possible solutions. The phase may include specific research  
techniques such as needs analysis, job analysis and task analysis. The outputs of this  
phase often include the instructional goals, and a list of tasks to be instructed. These  
outputs will be the inputs for the Design phase.

*Design*: The Design phase involves using the outputs from the Analyze phase to plan a strategy for developing the instruction. During this phase, you must outline how to reach the instructional goals determined during the Analyze phase and expand the instructional foundation. Some of the elements of the Design Phase may include writing a target population description, conducting a learning analysis, writing objectives and test items, selecting a delivery system, and sequencing the instruction. The outputs of the Design phase will be the inputs for the Develop phase.

*Development*: The Develop phase builds on both the Analyze and Design phases. The purpose of this phase is to generate the lesson plans and lesson materials. During this phase you will develop the instruction, all media that will be used in the instruction, and any supporting documentation. This may include hardware (e.g., simulation equipment) and software (e.g., computer-based instruction).

*Implementation*: The Implementation phase refers to the actual delivery of the instruction, whether it's classroom-based, lab-based, or computer-based. The purpose of this phase is the effective and efficient delivery of instruction. This phase must promote the students' understanding of material, support the students' mastery of objectives, and ensure the students' transfer of knowledge from the instructional setting to the job.

*Evaluation*: This phase measures the effectiveness and efficiency of the instruction. Evaluation should actually occur throughout the entire instructional design process - within phases, between phases, and after implementation. Evaluation may be Formative or Summative. Formative Evaluation is ongoing during and between phases. The purpose of this type of evaluation is to improve the instruction before the final version is implemented. Summative Evaluation usually occurs after the final version of instruction is implemented. This type of evaluation assesses the overall effectiveness of the instruction. Data from the Summative Evaluation is often used to make a decision about the instruction (such as whether to purchase an instructional package or continue/discontinue instruction).

Study Questions

* 1. Explain the importance of ISD to the production of instructional material
  2. What does ADDIE stands for and the activities involve in each of the alphabet
  3. Outline the sample task and output in ADDIE

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

Learning Section 6: [Quality Assurance for Multimedia Learning Materials (QAMLM)](#_Toc468790503) (duration)

Learning Objective(s): at the end of this lecture, students are expected to explain the concept QAMLM, describe the phases involve in QAMLM and state the similarities and differences between QAMLM and ADDIE models of instructional delivery.

Topic Outline: concept of QAMLM and its phases

Lecture Note

**Quality Assurance for Multimedia Learning Materials (QAMLM)**

**Analysis Phase (**captures requirements, sets expectations)**:** Prior to developing any  
multimedia materials, several questions relating to the target audience or learners, the  
nature of MLM, the learning styles, the conditions under which utilized, the purpose  
for the MLM and the nature of the content need to be answered. Unless there is clarity  
on these and several related issues the compatibility between the MLM and the  
learner may not be achieved. Analysis hence should capture the requirements and set  
expectations of the MLM. A study of analysis may be carried under five heads: needs, context, learner, task and content. These analyses would provide important inputs into  
design, development, implementation and assessment considerations.

**Design phase (**sets the blueprint, defines the framework**):** The design phase considers  
three sub-processes, instructional design strategy, visual design and technical design.  
The quality indicators re ect key points for each sub-process. Though the focus of  
this explanation is Multimedia Learning Materials (MLMs), the technical design  
provides indicators with respect to compatibility for online delivery requirements and  
use of latest developments in technology. Considerations for online delivery  
requirements is an optional requirement, but is defined as a quality indicator to  
suggest scalability of a product. An important consideration for the various sub  
processes in the design phase is that various strategies are contextually relevant,  
gender and racially sensitive. Prototype testing is included in the design phase to  
enable and allow necessary changes before development.

**Development phase (**creation, assembly and integration of media elements**):** One of  
the important considerations for the development phase would be that the media  
elements are strictly based on instructional programme requirement (IPR) with due  
credit given to the MLMs. This would be a pre-requisite for any quality certification.  
The second point is that the development is based on design decisions.

**Deployment (putting the product into action):** Even though, very often, MLM  
developers may not be solution implementers, there are some aspects of  
deployment that will impact on the learning situation and need to be considered at the  
time of developing a MLM. This part of the framework looks at some basic and  
preliminary considerations that can be taken into account to enhance the learning  
experience for the MLM user like a basic deployment strategy indicating how a  
product is to be used, its durability, re-usability etc.

**Feedback (**to measure effectiveness, recommendations for product improvement**):**Any MLM that provides an opportunity for feedback to be collected, outlining a  
strategy for it and providing valid tools for collecting feedback, can make a significant  
contribution to both understanding how the MLM is used and how it can be further  
improved upon. A MLM that outlines these automatically moves up on the quality  
scale.

Study Questions

* 1. What is the meaning of QAMLM?
  2. How many phase is involve in QAMLM
  3. What is the major difference and similarities between QAMLM and ADDIE models

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

**Learning Section 7:** [Selection Versus Development of Media Presentations](#_Toc468790504)(duration)

Learning Objective(s): At the end of the lecture, students should be able to

Topic Outline: Guidelines for selection of instructional media, presentation strategies for instructional media

Lecture Note

When instructional design is developed from the very beginning, one expects that  
media presentations will be part of the design. The term media, however, is employed  
here in a very broad sense. Instructional delivery may be accomplished by means of  
the verbal speech of a teacher or by a printed text as well as by way of vehicles of  
more complex technical materials, such as sound and video recordings. Often,  
however, existing media presentations are selected as part of a larger instructional plan rather than being separately designed and developed. Teachers, as well as teams  
of instructional designers, may earn' out a comprehensive design of instruction that  
depends upon the selection of media. Instruction is provided in a learning situation.  
The features of this situation impose constraints upon what media may be most  
effective. The kinds of media to be employed in a first-grade class, for example, are  
quite limited in variety in comparison with those appropriate for a class of high school  
students or a class of adults refreshing their technical skills. The following are  
features of the intended learning situations that need to be taken into account in  
selecting media:

* Communications to the learner delivered by the teacher (instructor) versus communications delivered via media for self- instruction
* Learners possessing sufficient verbal comprehension ability to comprehend printed communications versus learners who have insufficient verbal comprehension ability
* Communications delivered directly to the learner or learners versus communications broadcast from a central station
* The performance to be learned is such that errors are serious (that is, dangerous, as in the case of explosive chemical reaction) versus performance whose potential errors are not serious

Each of these features imposes some limitations on the kinds of media appropriate.  
Considering them in reverse order, the fourth feature would eliminate from  
consideration of all media except those on which the desired performances can be  
directly practiced, such as the actual equipment or a simulator device. Media such as a  
lecture or a TV program might set the stage, but would surely be inadequate for the  
learning of a skill. The third feature also limits media selection severely; to be  
considered for this kind of learning situation, media must be those that involve the  
transmission of messages composed of sound, pictures, or both, and which do not  
provide for interactive responding by the learner.

Study Questions

1. State the five features to be considered in selecting instructional media
2. Identify the types of media that can be selected for instructional delivery

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

**Learning Section 8:** [Integration Models for Technology in Teaching](#_Toc468790505)(duration)

Learning Objective(s): At the end of the lecture, students should be able define technology integration, describe the LoTi model, Identify the levels in LoTi model.

Topic Outline: Concept of technology integration, Levels of technology implementation (LoTi)

Lecture Note

The concept of technology integration is an attempt to provide measures in  
encouraging the implementation of technology for instructional delivery in order to  
assist in the restructuring of curriculum to include concept/ process-based instruction,  
authentic uses of technology, and qualitative assessment. One of such model that  
measures technology integration is *Levels of Technology Implementation* (LoTi). In  
the LoTi framework model, seven discrete implementation levels were proposed  
ranging from Nonuse (Level 0) to Refinement (Level 6). As a teacher progresses from  
one level to the next, a series of changes to the instructional curriculum is observed.  
The instructional focus shifts from being teacher-centered to being learner-centered.  
Computer technology is employed as a tool that supports and extends students’  
understanding of the pertinent concepts, processes, and themes involved when using  
databases, telecommunications, multimedia, spreadsheets, and graphics applications.  
Traditional verbal activities are gradually replaced by authentic hands-on inquiry  
related to a problem, issue, or theme. Heavy reliance on textbook and sequential instructional materials is replaced by use of extensive and diversified resources  
determined by the problem areas under study. Traditional evaluation practices are  
supplemented by multiple assessment strategies that utilize portfolios, open-ended  
questions, self-analysis, and peer review.

Study Questions

* 1. What does LoTi stands for?
  2. State the six levels of LoTi
  3. Explain any three levels of LoTi

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

**Learning Section 9:** [Technologies for Classroom Instructional Delivery](#_Toc468790506)

Learning Objective(s): At the end of the lecture, students should be to state technologies that can be used for instructional delivery and its application for teaching

Topic Outline: Technologies for classroom use

Lecture Note

There are various types of technologies currently used in traditional classrooms. Among these are:

*Computer in the Classroom:* Having a computer in the classroom is an asset to any teacher. With a computer in the classroom, teachers are able to demonstrate a new lesson, present new material, illustrate how to use new programs, and show new websites.

*Class Website:* An easy way to display your student's work is to create a web page designed for your class. Once a web page is designed, teachers can post homework assignments, student work, famous quotes, trivia games, and so much more. In today's society, children know how to use the computer and navigate their way through a website, so why not give them one where they can be a published author. Just be careful as most districts maintain strong policies to manage official websites for a school or classroom. Also, most school districts provide teacher webpages that can easily be viewed through the school district's website.

*Class Blogs and Wikis:* There are a variety of Web 2.0 tools that are currently being implemented in the classroom. Blogs allow for students to maintain a running dialogue, such as a journal, thoughts, ideas, and assignments that also provide for student comment and reflection. Wikis are more group focused to allow multiple members of the group to edit a single document and create a truly collaborative and carefully edited finished product. Blogs allow the student to express their knowledge of the information learned in a way that they like. Blogging is something that students do for fun sometimes, so when they are assigned an assignment to do a blog they are eager to do it! If you are a teacher and need to find a way to get your students eager to learn, create, and inspire assign them a blog. They will love it.

*Wireless Classroom Microphones:* Noisy classrooms are a daily occurrence, and with the help of microphones, students are able to hear their teachers more clearly. Children learn better when they hear the teacher clearly. The benefit for teachers is that they no longer lose their voices at the end of the day.

*Mobile Devices:* Mobile devices such as clickers or smartphone can be used to enhance the experience in the classroom by providing the possibility for professors to get feedback. See also M-Learning.

*Interactive Whiteboards:* An interactive whiteboard that provides touch control of  
computer applications. These enhance the experience in the classroom by showing anything that can be on a computer screen. This not only aids in visual learning, but it  
is interactive so the students can draw, write, or manipulate images on the interactive  
whiteboard.

*Digital Video-on-Demand:* Replacement of hard copy videos (DVD, VHS) with digital video accessed from a central server (e.g. SAFARI Montage). Digital video eliminates the need for in-classroom hardware (players) and allows teachers and students to access video clips immediately by not utilizing the public Internet.

*Online Media:* Streamed video websites can be used to enhance a classroom lesson (e.g. United Streaming, Teacher Tube, etc.)

*Online Study Tools:* Tools that motivate studying by making studying more fun or individualized for the student (e.g. Study Cocoa) *Digital Games:* The field of educational games and serious games has been growing significantly over the last few years. The digital games are being provided as tools for the classroom and have a lot of positive feedback including higher motivation for students. There are many other tools being used depending on the local school board and funds available. These may include: digital cameras, video cameras, interactive whiteboard tools, document cameras, or LCD projectors.

*Podcasts:* Podcasting is a relatively new invention that allows anybody to publish files to the internet where individuals can subscribe and receive new files from people  
by a subscription. The primary benefit of podcasting for educators is quite simple. It  
enables teachers to reach students through a medium that is both "cool" and a part of  
their daily lives. For a technology that only requires a computer, microphone and  
internet connection, podcasting has the capacity of advancing a student’s education  
beyond the classroom. When students listen to the podcasts of other students as well  
as their own, they can quickly demonstrate their capacities to identify and define  
"quality." This can be a great tool for learning and developing literacy inside and  
outside the classroom. Podcasting can help sharpen students’ vocabulary, writing,  
editing, public speaking, and presentation skills. Students will also learn skills that  
will be valuable in the working world, such as communication, time management, and  
problem-solving. Although podcasts are a new phenomenon in classrooms, especially  
on college campuses, studies have shown the differences in effectiveness between live  
lectures versus podcast are minor in terms of the education of the student.

Study Questions

* 1. State any five technologies that can be used for instructional delivery
  2. What is Podcast?
  3. Explain how you can use interactive whiteboard for classroom delivery

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

**Learning Section 10:** [Definition and Types of Evaluation Process](#_Toc468790508)

Learning Objective(s): At the end of this lecture, students should be able to differentiate the different types of evaluation process

Topic Outline: The concept of evaluation in educational technology, types of evaluation processes

Lecture Note

**Definition and Types of Evaluation Process**

Evaluation can be regarded as the process by which judgment about object or  
instructional content quality, value and worth is determined. In educational  
technology, there are basically four types of evaluation models namely diagnostic,  
formative, summative and prognostic evaluation.

Diagnostic Evaluation: A distinct form of measurement. Its purpose is to ascertain,  
prior to instruction, each student’s strengths, weaknesses, knowledge, and skills.  
Establishing these permits the instructor to remediate students and adjust the  
curriculum to meet each learner’s unique needs.

Prognostic Evaluation: it is the evaluation process employed to measure the attitude or  
behaviour of learners to the implementation of technology for instructional delivery.  
How far the development of personality and cultural awareness can be predicted in  
the integration of technologies for instructional delivery within the context of learning

Formative Evaluation: Formative evaluation is also useful in analyzing learning  
materials, student learning and achievements, and teacher effectiveness. Formative  
evaluation is primarily a building process which accumulates a series of components  
of new materials, skills, and problems into an ultimate meaningful whole. Formative  
evaluation is used to help improve performance of a leaner; identifying areas  
improvement and offering specific suggestions for improvement. Formative  
evaluations are basically done on the fly. They permit the designers, learners,  
instructors, and managers to monitor how well the instructional goals and objectives  
are being met. Its main purpose is to catch deficiencies ASAP so that the proper  
learning interventions can take place and allows the learners to master the required  
skills and knowledge.

Summative Evaluation: Evaluation of an individual learner used for judgments or  
decisions about the verification of achievement to serve as motivation and as well  
maintain or improve performance through certification of grades or promotion. A  
*summative evaluation* (sometimes referred to as external) is a method of judging the  
worth of a program at the end of the program activities (summation). The focus is on  
the outcome.

**Technology Evaluation Model – Kirkpatrick**

*The Four Levels of Evaluation,* also referred to as the *Kirkpatrick Evaluation  
Model,* was created by Donald Kirkpatrick, Ph.D. to define the four levels of training  
evaluation. The four levels of evaluation are: (1) the reaction of the student and their  
thoughts about the training experience; (2) the student's resulting learning and  
increase in knowledge from the training experience; (3) the student's behavioral  
change and improvement after applying the skills on the job; and (4) the results or  
effects that the student's performance has on the learning.

**Level 1: Reaction**

This level measures how your students (the people being trained), reacted to the  
technology integrated into instructional delivery. Obviously, as a lecturer or teacher, it  
is expected that you will want the student to feel that the quality instructional content  
and technology integration approach adopted would be of valuable experience with  
regard to the stated instructional objectives. Also, you want them to feel good about  
the topic/concept, the material, the presentation skill, and the learning environment.  
It's important to measure reaction because it assist in understanding how well the  
students have received your lecture in audience. It also helps you to improve on  
technology integration for future instructional content delivery, including identifying  
important areas or topics that are missing from the initial delivery. This level also  
gathers student’s information on their attitude towards the integrated technology for  
instructional delivery.

**\**

**Level 2: Learning**

At level 2, you measure what the students have learnt. How much has their knowledge  
increased as a result of the technology integrated for instructional delivery? When you  
planned the instructional delivery session, you hopefully started with a list of specific  
learning or instructional objectives: these should be the starting point for your  
measurement. Keep in mind that you can measure learning in different ways  
depending on these objectives, and depending on whether you're interested in changes  
to knowledge, skills, or attitude. It's important to measure this, because knowing what  
your students are learning and what they aren't will help you improve future  
integration of instructional technology for classroom teaching.

**Level 3: Behavior**

At this level, you evaluate how far your students have changed in behavior based on  
their exposure to the technology integrated for instructional delivery. Specifically, this looks at how students apply the information received through the technology medium.  
It's important to realize that behavior can only change if conditions are favorable. For  
instance, imagine you've skipped measurement at the first two Kirkpatrick levels and,  
when looking at your group's behavior, you determine that no behavior change has  
taken place. Therefore, you assume that your students haven't learned anything and  
that the technology integrated was ineffective. However, just because behavior hasn't  
changed doesn't mean that students haven't learned anything. Perhaps, you haven’t  
encourage them apply new knowledge through the technology integration platform  
adopted. Or, maybe they've learned everything you taught, but they have no desire to  
apply the knowledge themselves.

**Level 4: Result**

At this level, you analyze the final results of the technology integrated. This includes  
outcomes that you or your institution has determined to provide a technology enhanced learning environment that would promote effective and productive learning  
outcome.

Study Questions

1. When do you use prognostic evaluation process?
2. Explain diagnostic evaluation process
3. Which of summative and formative evaluation is most important?

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

**Learning Section 11:** [Social Media & Learning Management System for Learners and Educators](#_Toc468790514)(duration)

Learning Objective(s): At the end of the lecture, students should be able define learning Management System and its elements

Topic Outline: Definition of LMS, Characteristics of LMS, Strategies for LMS Implementation

Lecture Note

Learning Management Systems (LMS) play a central role in the Web-based e-learning  
scenario. It connects learning contents and learners together in a standardized manner. It  
manages users, learning materials (in the form of objects in Content Management  
System) and learning events. It manages and administers learning progress and keep  
track on learning Performance. It manages and administers administrative tasks. LMS is a  
software system designed to facilitate administrative tasks as well as student participation  
in e-learning materials. LMS is the framework that handles all aspects of the learning  
process. An LMS is the infrastructure that delivers and manages instructional content,  
identifies and assesses individual and organizational learning or training goals, tracks  
the progress towards meeting those goals, and collects and presents data for  
supervising the learning process of organization as a whole). An LMS can deliver  
content but also handles registering for courses, course administration, skills gap  
analysis, tracking, and reporting.

**Characteristics of LMS**

The following are some of the general characteristics of an LMS in education:

* instructional objectives are tied to individual lessons;
* lessons are incorporated into the standardized curriculum;
* courseware extends several grade levels in a consistent manner;
* a management system collects the results of student performance; and
* lessons are provided based on the individual student’s learning progress

**Strategies for LMS Successful Implementation**

In order for an LMS to produce the expected benefits, institutions should find various  
ways to maximize LMS usage within their institutions. The following are some  
strategies that can be used to increase LMS usage:

*Improving Usability of LMS:* Usability is a measure of how users find the LMS easy  
to learn, easy to use, and user-friendly. This is an important aspect of LMS design as  
it has direct impact on how users use the system. If the LMS is easy to use and easy to  
learn, learners will use the system more often. On the other hand, the LMS which is  
perceived to be difficult to use, and is not user-friendly, learners spend  
more time learning how to use the system rather than learning the content. In  
this case, users might feel lost, confused, or frustrated with the LMS. Generally,  
institutions should conduct usability evaluations to find out any usability problems  
that might be hindering users from using these systems. Fixing such usability  
problems will increase LMS usage due to the fact that many users will find the  
systems as easy to learn, easy to use and user-friendly.

*Developing and Uploading Quality Learning Materials*: Most lecturers in higher  
institutions lack the tradition and the experience to develop quality materials for their  
students and as a result, it not uncommon to find many adopted LMS not having  
enough quality learning materials uploaded in it. Learners, in most cases, rely on  
learning materials as the major source of information during the learning process.  
Consequently, great value is place on content that is well-organized, effectively  
presented, interactive, clearly written, in the right length, useful, flexible, and provide  
appropriate degree of breath. A strong relationship exists between the quality of  
learning materials and learners’ satisfaction with the LMS. Lecturers can also make  
use of Open Educational Resources (OER) from repositories to improve the  
quality of existing learning materials or to develop new learning materials and make  
them available via LMS.

*Enhancing Support* Services: Majority of the users in higher institution of learning  
have not been exposed to the learning management systems which explain the low  
patronage and confidence To be able to use the LMS effectively, institutions are  
required to provide reliable, timely, and effective support services to such users. The  
support services such as training, and several on-going support services are very  
important in order for users to continue using the LMS in the institutions of learning.  
The on-going support services may include live telephone support, email, instant  
messaging, informational websites containing documentation or tutorial videos  
Therefore, in order to maximize LMS usage, institutions should establish functional  
information and communication technology (ICT) Units to provide support services to  
both students and lecturers. For institutions with already established ICT Unit, they  
should equip them with qualified staff with both technical and pedagogical skills to be  
able to provide quality support services.

*Reviewing Relevant Policies:* Policies play a significant role in creating environment  
that enable academic members to make use of various eLearning technologies at a  
given institutions. They provide guidelines and strategies on how a certain technology  
should be adopted and used. These policies will not only provide a conducive  
environment for faculty members to be able to develop and upload learning materials  
into the LMS, but also, will increase LMS usage.

*Increase Awareness of LMS*: Lack of awareness amongst users on the existence or  
value of LMS has impact on LMS usage within the institutions. If users are not aware  
of LMS existence, it is obvious that they are not going to use it. The lack of awareness  
amongst users might be attributed to the fact that many LMS initiatives are normally  
introduced from top to bottom. Such kinds of initiatives face more resistance than  
initiatives started by departments or small units within the institution.  
Institutions should find various mechanisms to increase awareness not only on the  
existence of LMS but also on the advantages of the LMS in teaching and learning.  
This can be done through conducting awareness workshops within their department,  
disseminating brochures and flyers that provide information about LMS. Moreover,  
departmental group emails and information websites can be used.

*Making Use of Mobile* Applications: While access to computers and the Internet is  
still a challenge in many institutions, the emergence of mobile devices brings a new  
hope. According to eTransform Africa Report of 2012 produced by the World Bank  
and the African Development Bank, there were almost 650 million mobile  
subscriptions in Africa, more than in the United States or the European Union making  
Africa the second fastest growing region in the world in mobile phone penetration  
(World Bank 2012). Additionally, the most recent report by Ericsson of 2013  
indicated that 70% of users in sub-Saharan Africa browse the web on mobile devices,  
compared with just 6% who use desktop computers. Given these developments,  
mobile devices have become an integral part of many users’ everyday lives. Taking  
advantages of advancement of mobile penetrations, institutions should develop mobile  
interfaces that encourage enable users to be able to access LMS via their mobile  
devices.

*Complementing with Social Media*: There is a growing adoption and use of various  
social media services by both student and lecturers in higher institution of learning.  
In order to increase LMS usage, institutions could make use of social media services  
to complement LMS features. For example, lecturers could share learning materials  
via the LMS while using social media for communication purposes. The majority of  
social media services have rich and friendly tools for communication. Integrating  
LMS with audio and video conferencing features can concretize learning and Such  
features can easily be complemented by the use of social media facilities.

Study Questions

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

**Learning Section 12:** [Change Process for Implementing Instructional Technologies in Higher Education](#_Toc468790518)

Learning Objective(s): At the end of the lecture, students should be able define change within the context of instructional technology, describe technology acceptance model

Topic Outline: Definition of change, model on behavioural change; technology acceptance model

Lecture Note

Theories and models of human behaviour emanate from all disciplines of the social  
sciences. Indeed, in many ways disciplinary boundaries simply serve to demarcate the types and contexts of human behaviour in which scholars are interested, how  
behaviour is defined, and the methods via which it might be studied. In this sense,  
attempting a comprehensive review of theories of behaviour would not be possible.  
Having said this, attempts have been made to develop theories and models of human  
behaviour which transcend specific contexts. This attempt to isolate the key  
controlling factors, processes or causes of behaviour, and most originated from within  
psychology (particularly social psychology) and sociology. Anthropology also offers  
considerable insight, especially in relation to factors such as habit and ritual, and  
politics provides a focus on power and institutional structures. Some theories of  
behaviour and behaviour change emphasize the impact of technology on behaviour  
and the role of innovation as an agent of change. In essence, established technology  
can in some instances perpetuate unsustainable behaviours and adherence to particular  
economic models and scales. Innovation can facilitate alternative behaviours, some of  
which may initially fill a particular niche requirement but subsequently spread to  
challenge or replace dominant technologies (so-called ‘disruptive’ innovation).  
Responses must promote technological innovation and its spread and challenge  
entrenched technology use which perpetuates unsustainable behaviour.

**Model on Behavioural Change for Technology Integration**

Technology Acceptance Model such as Unified Theory of Acceptance Use of  
Technology (UTAUT) try to explain the degree of acceptance of the use of  
information technology. These theories assess whether the user will be able to accept  
the new technologies and user’s ability to deal with it. The Technology Acceptance  
Model helps managers and decision makers to assess the success of the introduction  
of technology to the organization, and motivate users to accept the systems UTAUT has been used and applied by many educational institutions and research to answer one of the most critical questions: What are the user's attitudes towards accepting ICT solution? Regardless of the level of available infrastructures and support administrations, there is a concern as to whether teachers are prepared to integrate available technology into effective lessons for their students. UTAUT was formulated by Venkatesh et al (2003), which consists of four main concepts, Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and  
Facilitating Conditions (FC). These four main concepts are independent variables  
which influence dependent variables, behaviorals and usage. Gender, age, experience,  
and volunteers of system use have indirectly influenced the dependent variables via  
the four main concepts . Behavioral intention is seen as a critical predictor of  
technology use (Venkatesh et al., 2003).

**Performance expectancy:** “The degree to which an individual believes that using the  
system will help him or her to attain gains in job performance” (Venkatesh et al.,  
2003). Performance expectancy is hypothesized to moderate the influence on  
behavioral intention by gender and age.

**Effort expectancy:** “The degree of ease associated with the use of the system”  
(Venkatesh et al., 2003). Effort expectancy hypothesized to moderate the influence on  
behavioral intention by gender and age, and experience.

**Social influence:** “The degree to which an individual perceives that important others  
believe he or she should use the new system” (Venkatesh et al., 2003). Social  
influence, hypothesized to moderate the influence on behavioral intention by gender  
and age, and experience, and volunteers of system.

**Facilitating conditions:** “The degree to which an individual believes that an  
organizational and technical infrastructure exists to support use of the system”  
(Venkatesh et al., p. 2003). Hypothesized to moderate the influence on behavioral  
intention by age, and exp

Study Questions

Reference Materials:

1. Reading List
2. Web Materials
3. YouTube Directory

**Learning Section 13:** Revision