Technology for Teaching and Learning

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Prepared by:

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INTRODUCTION

The Technology for Teaching and Learning P1 is designed to engage pre – service students in the theories and principles of designing, developing, utilizing, and evaluating teaching and learning resources to improve instructions through the various opportunities brought by different instructional media and technology. It also provides the pre – service teachers with he accumulated knowledge, skills, attitudes, and values in creating technology – enhanced instructional plans appropriate to their field of specializations. This course also encourages students to promote responsible use of technology and exhibit ethical behavior in professional practices.

Course Outcomes

It is expected that after the finishing the course, the students must:
1. Develop skills and capabilities to acquire broad knowledge on how to critically analyze and present information using varied instructional resources;
2. Determine the benefits and limitations of various instructional media utilized in the teaching – learning process;
3. Understand the nature of their learners in the future and how instructional materials and the use of technology help in the attainment of the learning goals;
4. Create, rich, learning environments that build their students' competencies and independence; and
5. Practice and advocate ethical use of technology in both their personal and professional levels.

Course Contents

The preservice students who will take this course will have to deal with only the fundamental competencies of contextualizing the relationship of technology towards the teaching and learning process, as this becomes the pre requisite to the next level of the same course. The focus of instruction are the most indispensable competencies that the learners must acquire, as they anticipate challenges in the learning delivery.

The perspectives of each module presented in this instructional material are in these formats:

1. ***Topic Framework –*** outlines the content of each module;
2. ***Learning Outcomes –*** domains of learning that can be acquired after each topic;
3. ***Activity –*** stimulating prior knowledge of preservice teachers;
4. ***Analysis –*** questions that will guide preservice teachers to explore various possibilities of learning experiences from the activity phase;
5. ***Abstraction –*** what the preservice teachers need to know deriving from the experiences in the analysis phase; and
6. ***Application / Assessment –*** follow up activity on how students can apply what they have learned at the end of each module.

Activities were designed in a flexible learning mode, taking into consideration the "digital divide" among students.

Course Requirements

The activities designed for each module will form the "pieces of the puzzle", that at the end of the term, a course portfolio will be submitted, be it in the online learning or offline learning. Portfolio must have three (3) sections namely: *Activity, Analysis, and Application / Assessment.* These sections will be gradually filled – up with specific contents that need to be accomplished for each module. Rubrics for grading the portfolio, integrated with the reflective writing activities are found at the appendices of this instructional material.

Grading System

Class Standing	=	70%

- o Activity Section / Folder
- o Reflective Writing

Portfolio Notebook or e-Portfolio	=	<u>30%</u>
Course Grade		**100%**

Consultation Hours

Time availability of the course facilitator for further discussions on the activities indicated in this instructional material can be possible for those learners who can join scheduled online classes throughout the course duration.

> **"Education is a progressive discovery of your own ignorance."**
> **Be miserable or motivate yourself.**
> **Whatever must be done, it's always your choice."**
>
> -- David M. Burns --

TABLE OF CONTENTS

MODULE 1: Introduction to Technology for Teaching and Learning

TOPIC FRAMEWORK

- Basic Concepts
- Evolution of Technology for Instruction
- Integrating ICT in Education

LEARNING OUTCOMES

After the successful completion of this module, the student must be able to*:*

- Demonstrate a clear understanding of the course as an instrument to effective teaching – learning process.
- Plan, model, and promote a safe and sound technology – supported learning environment

ACTIVITY TASK #1

Online Learning	**Offline Learning**
✓ One – minute brainstorming: Write as many words as you can associate with each term, "Technology, Teaching, Learning, Information Communication Technology, Media Literacy". Submit the output on a Word Cloud Format in the Activity Folder of your e-portfolio.	o One – minute brainstorming: Write as many words as you can associate with each term, "Technology, Teaching, Learning, Information Communication Technology, Media Literacy". Write terms and prepare a collage or a graphic organizer creatively in the Activity Section of your Portfolio notebook.

ANALYSIS

➢ Can you figure out how does technology evolved in the teaching and learning process?
➢ How important is integrating technology in education?

ABSTRACTION

BASIC CONCEPTS

Technology – refers to the advancements in the methods and tools people use to solve problems and achieve a goal. In the classroom, technology can encompass all kinds of tools from low – tech (pencil, paper, chalkboard) to high – tech (presentation software, tablets, computer, etc.).

Wainwright (2016) posits 10 reasons why technology should be implemented in the classroom.
1. Technology will help students in the future career especially those who need wireless technology.
2. Technology addresses diversity in learning styles.

3. Technology gives students the chance to interact.
4. Technology helps teachers prepare students for the real world environment.
5. Technology keeps students engaged.
6. Technology makes the classroom a happier place.
7. Technology allows students to access updated information faster than before.
8. Technology makes students more responsible.
9. Technology breaks the tradition of passive learning.
10. Technology allows students to access digital materials and databases.

Information Communication Technology – much sought breakthrough that changed many aspects of human's life most essentially the educational realm. (David Warlick: as cited by Torlakson and Pletka, 2014) ICT underpins the success of the educational domains as it adds to the processes of learning. It helps gain competencies in critical thinking, generalist competencies, decision – making, handling of difficult situations, working as a team, and communicating effectively. (UNESCO, 2002)

The use of ICT in education evolved in four phases: *emerging, applying, infusing, and transforming.*
- ✓ *Emerging* – schools were described as teacher – centered
- ✓ *Applying* – the use of ICT has begun with the adaption of some ICT products
- ✓ *Infusing* – involved the integration of ICT across the curriculum, an increased use of computer – based technologies
- ✓ *Transforming* – ICT has been taught as a separate subject and the curriculum is now student – centered.

Instructional Materials – designed for use in the teaching and learning process that will help learners acquire facts, skills, or opinions or develop cognitive processes.

They also refer to resources that organize and support instructions, such as textbooks, tasks, and supplementary resources (adapted from Remillard & Heck, 2014)

Digital – involving or relating to the use of computer technology (Oxford Dictionary, 2017); electronic technology that generates, stores, and processes data in terms of the two states: positive, expressed in 1 string and non – positive, expressed in 0 string. (Whatls, 2017)

EVOLUTION OF TECHNOLOGY FOR INSTRUCTION

1600 -- Quill Pens and Slates – Early one –room schoolhouses in the 1700s and 1800s used these materials to teach students how to write and cipher.
1700 -- Primers – The New England Primer remained the basic school text for 100 years after its publication.
1826 -- Wall Charts – to save the cost of individual books, passages were sometimes printed in large letters and hung for all to see in Lancastrian schools.
1855 -- Models – with the introduction of kindergarten in Wisconsin, models and materials were given to students to manipulate and to learn from.
1901 -- Manipulative – Maria Montessori's kinesthetic approach offered a variety of manipulative from which students could learn.
1904 -- Educational Museums – the visual – education movement resulted in educational museums with abundant visual displays.

1910 -- Films – Edison declared after inventing motion pictures that books would soon be obsolete. Public schools in New York City implemented films for instruction for the first time. Edward Thorndike - helped established education as a science.

1914 -- Behaviorism Theory – John Watson helped establish behaviorism, which became one of the theoretical foundations of learning.

1929 -- Radio – The Ohio "School of the Air" broadcast instructions to homes.

1933 -- Objectives in Education – Ralph Tyler at Ohio State University developed and refined procedures for writing objectives.

1940 – 1945 -- Instructional Technologists – with the role of technology in learning increasing, the need for expertise in both education and technology grew, and professional instructional technologists emerged.

1945 -- Multiple Media used by Military Armed Forces – training used films, sound, graphics, models, and print to help prepare recruits for war.

1953 -- ITV – The University of Houston launches KUHT, the first non-commercial education station.

1956 -- Bloom's Taxonomy – a team led by Benjamin Bloom identified and articulated levels of cognition.

1957 -- Programmed Instruction – instruction materials based on Skinner's behaviorism were used at the Mystic School in Winchester, Massachusetts.

1965 -- Instructional Design System – Robert Gagné introduced a model for a systems approach to designing instruction.

1967 -- PBS and NER – The Public Broadcasting Act established the Public Broadcasting Service and National Educational Radio.

1970 -- Cognitive Approach – cognitivists including Ausubel, Bruner, Gagné, and others dominated thinking about learning.

1977 - Personal Computers – the first microcomputer, the Apple, was created by Steve Wozniak & Steve Jobs.

1980 -- CAI – computer – assisted instruction on personal computers reached its peak of popularity.

1990 -- Constructivist Approach – the influence of Dewey, Piaget, Vygotsky, and others led to the emergence of the constructivist view of learning. Computer – based technologies – video discs, CD – ROMs, multimedia, digital presentations, interactive video, teleconferencing, compressed video, and the Internet combined to greatly increase the technologies available to enhance teaching and learning. Virtual Reality – digital representations of a given reality let teacher and student "experience" it.

1990 - Digital Assistants – intelligent agents help people interact with the equipment and cyberspace

1991 - World Wide Web – the Internet became accessible to all with the creation of the Web by Tim Berners – Lee.

2003 - Mobile Devices – smart phones, netbooks, and handheld PCs joined with wireless networking to make mobile computing commonplace everywhere, including in the classroom.

2008 and beyond -- Online Life – the Internet expands to include the Web 2.0, featuring social networking, audio and video streaming and options, for interaction leading to instruction anytime, anywhere. The Grid – using distributed computing technology, the Grid will make it possible to dynamically pool and share computer resources, making unprecedented computing power available to everyone on the Grid.
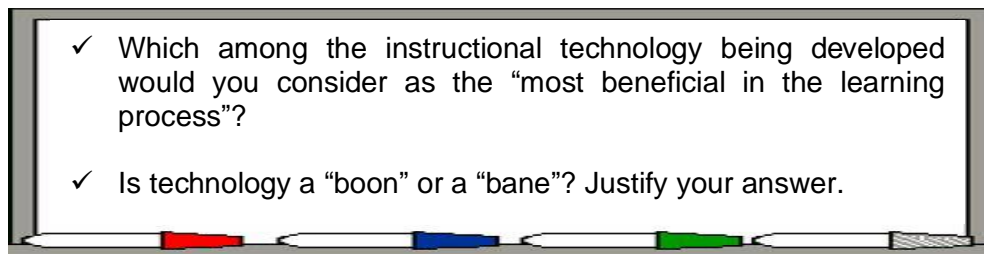
Watch the video clip about: The History of Technology in Education: https://www.youtube.com/watch?v=UFwWWsz_X9s

INTEGRATING ICT IN EDUCATION

o *Gain attention* -- technology's visual and interactive qualities can easily motivate and direct students' attention toward learning tasks.
o *Support manual operations during high – level learning* – students are more motivated to learn complex skills when technology tools help them do the low – level skills involved
o *Illustrate real world relevance through highly visual presentations* – students are more likely to learn skills that have clear real – life applications to their future work.
o *Engage through production work* – students who learn by creating their own products with technologies such as word processing, multimedia, hypermedia and other technology products report higher engagement in learning and a greater sense of pride in their achievements.
o *Collaborate students with audience for their communication* – students get to be more motivated to write and do their best production work when they publish it on the Web, since others outside the classroom will see their work.
o *Supply self – paced learning for capable students* – students who can learn on their own with software tutorials and / or distance educational materials can be directed to take topics ahead of others.
o *Allow access to learning opportunities* – students with disabilities depend on technology to compensate for vision, hearing, or manual dexterity they need to read, interact in class, and do products to show what they have learned.
o *Provide faster access to information* – integrated learning systems can help teachers quickly assess and track students' progress, also, collection of submitted data online can be gathered easily.

APPLICATION / ASSESSMENT

Reflective Writing

✓ Which among the instructional technology being developed would you consider as the "most beneficial in the learning process"?

✓ Is technology a "boon" or a "bane"? Justify your answer.

## MODULE 2: Understanding the 21st Century Learners

TOPIC FRAMEWORK

- Characteristics of the 21st Century Learners
- Theoretical Foundations of Learning
- Systematic Approach Towards a Holistic View of Teaching, Learning, and Technology

LEARNING OUTCOMES

After the successful completion of this module, the student must be able to:

- Examine the learners' characteristics that affect learning.
- Apply the principles of learning classroom situations to promote effective pedagogy.

ACTIVITY TASK #2
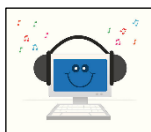
Online Learning

✓ Take any learning styles inventory test online to assess your learning profile. You may visit the links as examples: https://www.learning-styles-online.com/inventory/; https://vark-learn.com/
✓ Prepare answers in a Word document file and upload the file in the Activity Folder of your e-portfolio.
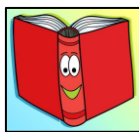
Offline Learning

- Determine your learning style by answering the Learning Style Inventory Sheet found in the Appendix part of this Module. Write answers on each question, and the result of your personal assessment in the Activity Section of your Portfolio notebook. Accomplish also the ***My Personal Learning Style Plan*** part.

ANALYSIS

➢ What are the different learning styles of students?
➢ Is there a specific literacy that needs to be further developed than the other literacies?
➢ How significant is the use of learning domains or taxonomies of objectives in designing lessons appropriate for the types of learners in this generation?

ABSTRACTION

Learning is the development of new knowledge, skills, or attitudes as an individual interacts with information and the environment. Learners in the 21st century need to be better educated to assume the challenges of continually evolving knowledge and skill requirements for the future**.**

CHARACTERISTICS OF A 21ST CENTURY LEARNER

Learners will have to acquire a set of skills and adopt certain characteristics in order to become successful in 21st century society.

- **Creativity and Innovation** -- "Creativity is as important in education as literacy and we should treat it with the same status." – Sir Ken Robinson, 2013. Creative and innovative skills are highly desired in the 21st century learners. 21st century children need to be able to think creatively, work creatively with others and also implement innovation in their everyday lives. Teachers needs to foster and support the development of creative skills in learners that allows for them to take part in creative exploration and discovery. By giving children challenging problems, they are encouraged to use more of their potential creativity, using innovation on how to overcome these challenges.

- **Collaboration and Communication** -- the world learners are growing up in today is a world where communication, collaboration and teamwork is essential. Effective collaboration requires students learn to respect each other's differences and use their different personalities. This allows children to collectively solve problems as a team, creating and innovating original ideas (Delp, 2011). Learning to collaborate effectively will greatly increase any given student's employment opportunities in the future as the collaboration of knowledge is a key factor in today's global corporate world.

- **Critical Thinking & Problem Solving** -- students need the ability to think critically and solve any problem which may occur in their lives. Constant technological advancements mean that students need to be prepared to adapt to any change and continue to perform at their potential, both in their education and future employment. To be able to adapt to change effectively, students need to have the ability to make connections between information and arguments, interpret information to draw conclusions, and reflect critically on learning experiences and processes to better prepare themselves for the global workforce.

Key Areas of Literacy

- *General literacy* **--** the ability of a student to comprehend or decode information and to use, transform, and create new information.
- *Text literacy* **–** skills to use text – based resources as a means to gather, interpret, and communicate information.
- *Computer literacy* -- encompasses the knowledge and skills to operate systems and how to recognize and find solutions to hardware and software problems.
- *Distance learning literacy* **--** comprises three main components that are applicable when teachers and students are separated by time or distance: designing and facilitating learning experiences, modelling and promoting learning and responsibility, and engaging in lifelong learning.
- *Cyber learning literacy* **–** involves the use of a variety of technology tools to connect students with people and resources beyond the boundaries of a normal classroom setting.
- *Visual literacy* – learned ability to interpret and create visual messages accurately from visual media in instructions such as textbooks, workbooks, digital media, newspapers, books, and magazines filled with visual images.

- *Audio literacy* **–** skill to understand the role of hearing and listening in learning when verbally presenting information to students.
- *Video literacy* -- understands and evaluates video messages and to create video that appropriately achieves the intended outcomes in digital formats such as DVD and downloadable files.
- *Media literacy* **–** students' abilities to interpret and produce a wide variety of media, including text, audio, visuals, and video, which are often combined to form multimedia.
- *Information literacy* **–** require a high degree of capability to locate materials from a variety of online sources and ensure the material is accurate, appropriate, easily accessible, and useable according to copyright guidelines.

Learning Styles

Learning style is another factor influencing how an individual learns. Most learning style theorists identify three primary modalities for learning: auditory, visual, and kinaesthetic. Some individuals learn best by listening, others learn best by seeing, and others learn best by doing. Although everyone can learn using each of these modalities, learning style theorists suggest that each person has a preference, a dominant sensory gateway.

Learning Style Models

Kolb's Learning Style Model
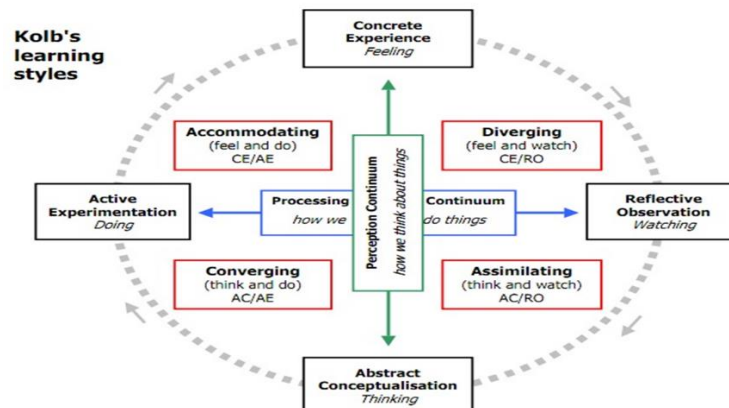
Myers – Briggs Type Indicator Model

Felder – Silverman Learning Style Model
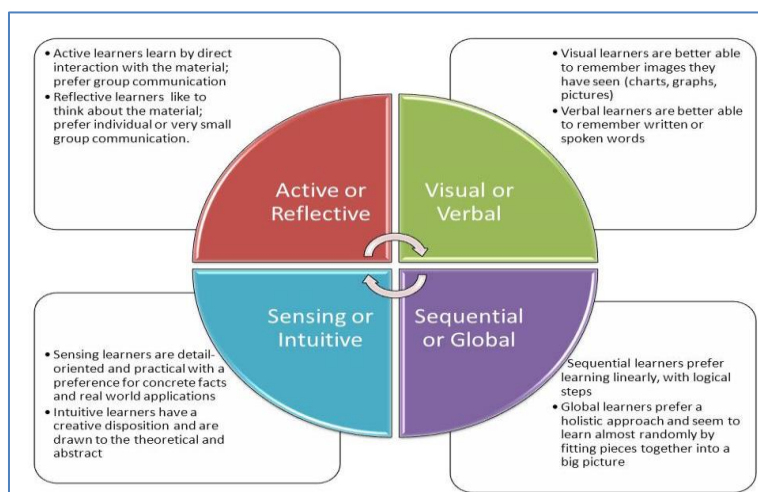
VAKT (Visual/Aural/Kinesthetic/Tactile)

Multiple Intelligences

It is important for teachers to be aware of the multiple types of student intelligences when planning lessons. The concept of Multiple Intelligence was developed by Howard Gardner, who introduced a revolutionary theory of various kinds of intelligences. A learner may exhibit more than one kind of genius. This study / theory successfully frees the limiting confines of IQ theory measured by Alfred Binet.

- ➢ Linguistic Intelligence
- ➢ Logical – Math Intelligence
- ➢ Musical Intelligence
- ➢ Visual – Spatial Intelligence
- ➢ Bodily – Kinaesthetic Intelligence
- ➢ Interpersonal Intelligence
- ➢ Intrapersonal Intelligence
- ➢ Naturalist Intelligence

THEORETICAL FOUNDATIONS OF LEARNING

How teachers view the role of technology and media in the classroom depends very much on their beliefs about how people learn. Several dominant theories of learning have implications for instruction in general and for the use of technology and media. Driscoll (2005) discusses learning theories and their impact on teaching decisions in greater detail.

1. *Behaviorist Perspective* – view all behavior as a response to external stimuli. A stimulus is the initial action directed to the organism, and a response is the organism's reaction to that action. According to behaviorists, the learner acquires behaviors, skills, and knowledge in response to the rewards, punishments, or withheld responses associated with them. Burrham Freidrich Skinner was the father of modern behaviorism. He viewed voluntary behavior, such as learning new skills, with reinforcement or reward, could shape the behavior patterns of an organism. The result was the foundation for **computer – assisted instruction** and learning.

2. *Cognitivist Perspective* – focus on learning as a mental operation that takes place when information enters through the senses, undergoes mental manipulation, is stored, and is finally used. This theory makes mental activity (cognition) the primary source of study. Cognitive theorists attempt to explain learning in terms of how one thinks. Learning and problem solving, according to cognitivists, represent mental processes that are undetectable by mere observation. Key theorists in this perspective include Jerome Bruner and David Ausubel. Early works of Jean Piaget also significantly contributed to this perspective. Cognitivists create a mental model of short – term memory and long – term memory. New information is stored in short – term memory, where it is rehearsed until ready to be stored in long – term memory.

   Cognitivists have a broader perception of learning than that held by behaviorists. Students are less dependent on the guiding hand of the teacher and **rely more on their own cognitive strategies** in using available learning resources.

3. *Constructivist Perspective* – knowledge is a constructed element resulting from the learning process. Further, knowledge is unique to the individual who constructs it. Learning is not seen as just the product of mental processes; it is an entirely unique product for each individual based on the experiences within which those mental processes occurred. Jean Piaget also theorized that children construct mental maps as they encounter information. New knowledge is either assimilated (fitted into existing maps) or accommodated (existing maps are adjusted to accommodate the new information). Seymour Papert adapted Piaget's perspective and applied to the children engaged in using technology. Robert Gagné perspective, learning is a result of an individual's cognitive efforts to construct his or her personal knowledge.

   Constructivists emphasize that learners **create their own interpretations of information within their own experience**. The role of instruction is to provide students with ways to assemble knowledge rather than to dispense facts. Proponents believed that learning occurs most effectively when students are engaged in authentic tasks that relate to meaningful contexts (i.e. learning by doing).

4. *Social Learning Perspective --* the other view that of social constructivism was well articulated by Lev Vygotsky and Albert Bandura. Their view is that learning is considered a result of the collaboration of a group of learners in an effort to construct a common core

of knowledge. Social psychologists look at how the social organization of the classroom affects learning. Robert Slavin (1990) have taken the position that cooperative learning is both more effective and more socially beneficial than competitive and individualistic learning. Slavin developed a set of **cooperative learning techniques** embodying the principles of small – group collaboration, learner – controlled instruction, and rewards based on group achievement.

Domains of Learning

Benjamin Bloom classified educational objectives into three domains such as cognitive, affective, and psychomotor. In stating these objectives, they should be expressed as specific, observable, measurable, realistic, and time – bounded terms.

Cognitive domain – composed of intellectual abilities which involve the recall of specific information and the processes of analysis and decision making.

Affective domain – includes emotions, interest, appreciation and others related to aesthetic expression. They are frequently hidden from observation since they are values which a learner places upon what is being learned including attitudes toward learning.

Psychomotor domain – embraces muscular or motor abilities – manipulation, writing vocational and technical abilities. These are behaviors that require motor skills. The first term, psycho, means mind, and the second term, motor means movement.

Benjamin Bloom, with collaborators Max Englehart, Edward Furst, Walter Hill, and David Krathwohl, published a framework for categorizing educational goals: **Taxonomy of Educational Objectives** (https://www.bloomstaxonomy.net/: Retrieved: 10 August 2020)

The Revised Taxonomy (2001)

While each category contained subcategories, all lying along a continuum from simple to complex and concrete to abstract, the taxonomy is popularly remembered according to the six main categories.

The authors of the revised taxonomy underscore this dynamism, using verbs and gerunds to label their categories and subcategories (rather than the nouns of the original taxonomy). These "action words" describe the cognitive processes by which thinkers encounter and work with knowledge.
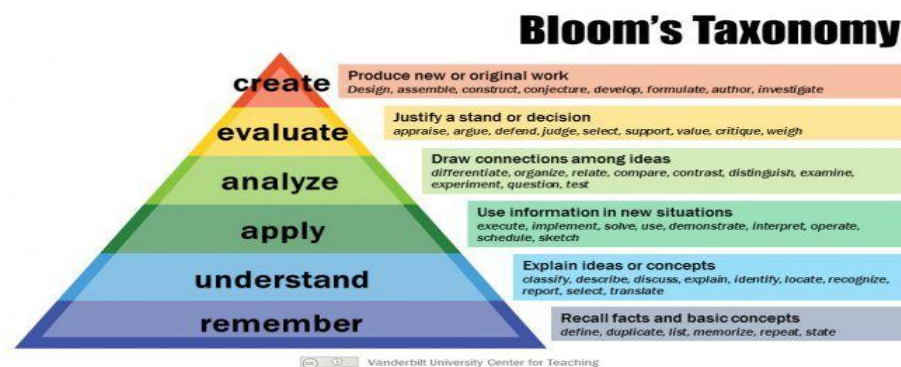
(https://www.bloomstaxonomy.net/: Retrieved: 10 August 2020)

Integrating Technology with Bloom's Taxonomy

Research indicates that "today's students, regardless of demographics, have shown an interest in digital opportunities to learn, and the range of the Web tools that make collaboration, innovation, and individual exploration possible is incredible." (Lightle, K., 2011). Practitioners in the field of education have thought of unique ways to connect digital tools with the framework of Bloom's Revised Taxonomy, which has led to the emergence of a Digital Bloom's Taxonomy.

Bloom's Digital Taxonomy

The purpose of this illustration is to inform the teachers of how to use technology and digital tools to facilitate student learning experiences and outcomes. It aims, "to expand upon the skills associated with each level as technology becomes a more ingrained essential part of learning." The digital tools can act as vehicles for transforming students' thinking at different levels. With the myriad of digital tools, teachers can navigate and make choices based on the designed learning experiences that s/he wants his / her students to engage in.

- o *Creating* – to produce new or original work; Tools – animating, blogging, filming, podcasting, publishing, simulating, wiki building, video blogging, programming, directing
- o *Evaluating* – to justify or stand a decision, to make judgments based on criteria and standards through checking and critiquing; Tools – grading, networking, rating, testing, reflecting, reviewing, blog commenting, posting, moderating
- o *Analyzing* – to draw connections among ideas, concepts, or determining how each part interrelate to an overall structure or purpose; Tools – mashing, mind mapping, surveying, linking, validating
- o *Applying* – to use information in new situations such as models, diagrams, or presentation; Tools – calculating, charting, editing, presenting, uploading, operating, sharing with a group
- o *Understanding* – to explain ideas, concepts, or construct meaning from written material or graphics; Tools – advanced searching, annotating, blog journaling, tweeting, tagging, commenting, subscribing
- o *Remembering* – to recall facts, basic concepts, or retrieval of material; Tools – bookmarking, copying, googling, bullet – pointing, highlighting, group networking, searching

Bloom's Digital Taxonomy
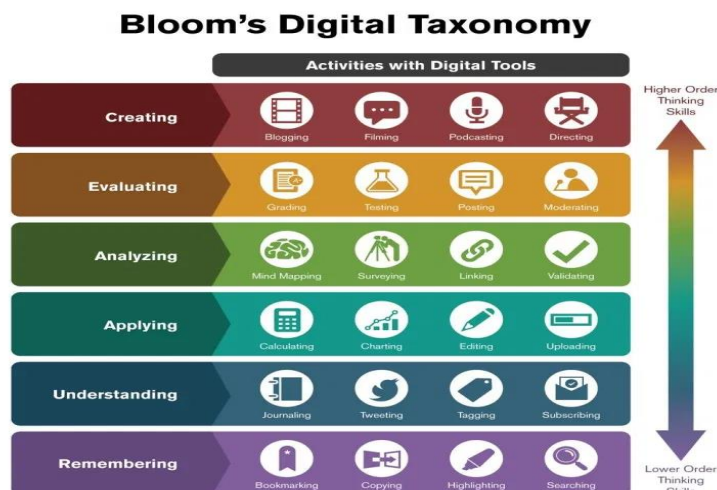
Infographic Credit: Ron Carranza (https://teachonline.asu.edu/2016/05/integrating-technology-blooms-taxonomy/ Retrieved 10 August 2020)

SYSTEMATIC APPROACH TOWARDS A HOLISTIC VIEW OF TEACHING, LEARNING, AND TECHNOLOGY

Systematic approach to teaching is a network of elements or parts different from each other but each one is special in the sense that each performs a unique function for the life and effectiveness of the instructional system. The systems approach views the entire educational program as an orchestrated learning pattern will all parts harmoniously integrated into the whole: the school, the teacher, the students, the objectives, the media, the materials, and the assessment tools and procedures. This approach integrates the older, more familiar methods and tools of instruction with the new ones such as the utilization of technology to a creation of a System Instructional Design.

Since teaching is a systematic, planned sequence of events that facilitates the communication of an idea, concept, or skill to a learner, the act of teaching requires an understanding of the learner, how s/he learns as s/he interacts in the his / her environment, and the factors that affect his / her learning process. Understanding the characteristics of the 21st century learner will help the teacher in designing instructions, making them more exciting and engaging with the support of technology in its delivery.

APPLICATION / ASSESSMENT

✓ Relate the result of your learning style to the Theoretical Foundations of Learning. What perspective will greatly affect your learning style?

✓ Cite one learning theory with which you most agree and give examples of classroom activities that supports this theory. Be able to integrate what technology can be utilized to make the learning experience more meaningful. Use the Bloom's Digital Taxonomy as your reference for a particular activity.

MODULE 3: Theories and Principles in the Use and Design of Technology – Driven Learning Process

TOPIC FRAMEWORK

- Edgar Dale's Cone of Experience
- Jerome Bruner's Three – tiered Model of Learning
- TPACK (Technology, Pedagogy, and Content Knowledge)

LEARNING OUTCOMES

After the successful completion of this module, the student must be able to:

- Distinguish the different bands of experience and how they are applied systematically in various learning areas.

- Conceptualize the complex interplay of the components of TPACK to effectively integrate technology for pedagogy around specific subject matter.

ACTIVITY TASK # 3

Online Learning	Offline Learning
✓ Illustrate on a Venn diagram the concept of the Traditional Views of Technology where learning is **through** technology to the Contemporary Views of Technology where learning is **with** technology. Use only short phrases in your illustration. Upload your file in the Activity Folder of your e-portfolio.	• Draw a Venn diagram on a bond-sized paper to illustrate the concept of the Traditional Views of Technology where learning is **through** technology to the Contemporary Views of Technology where learning is **with** technology. Use only short phrases in your illustration. • Cut out your drawing and paste it in the Activity Section of your Portfolio notebook.

ANALYSIS

➢ What is a Cone of Experience? How will this Cone of Experience help teachers in the teaching – learning process.
➢ Differentiate the Cone of Experience to a Three-tiered Model of Experience

ABSTRACTION

EDGAR DALE'S CONE OF EXPERIENCE

Graphic courtesy of Edward L. Counts, Jr.
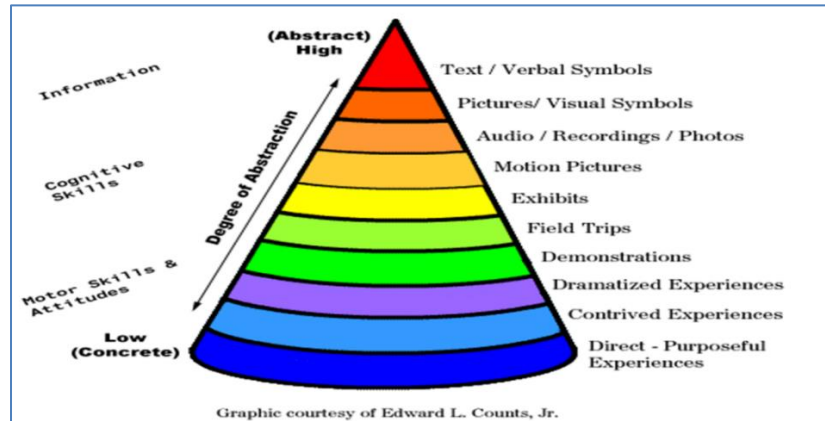
Years ago, an educator named Edgar Dale, often cited as the "Father of the Modern Media in Education", devised in his book, Audio – Visual Education in 1946, the "**Cone of Experience**". Derived from his experience in teaching and his observations of learners, the Cone is a visual analogy used as a guide by teachers in choosing what, why, and how much instructional material they should use to provoke learning with the most satisfying result.

The Cone of Experience is a visual model presented in its inverted form, such that the base is broader than its apex. It suggests that learning is more impressive if one proceeds from concrete to abstract, or from specific to general, because more senses are involved, and relationships are built in a more pronounced manner. The more senses that are involved in learning, the more and the better the learning will be.
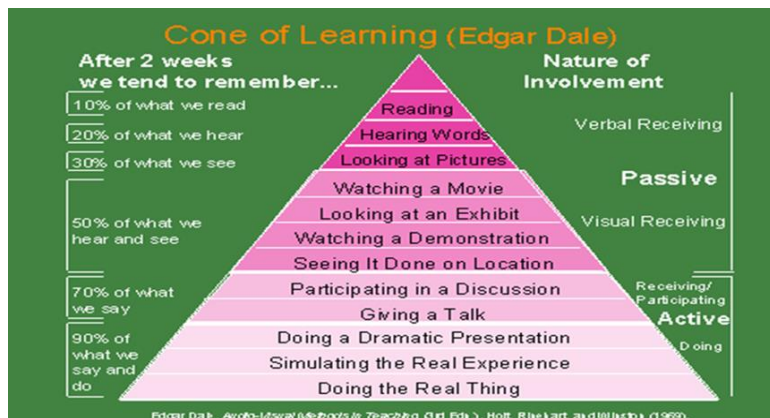
JEROME BRUNER'S THREE – TIERED MODEL OF EXPERIENCE

Jerome Bruner, a Harvard psychologist, devised his own version of the Cone of Experience, in what he called, Three – Fold Analysis of Experience, or the Three – Tiered Model of Experience where he points out that every area of knowledge can be presented and learned in three distinct steps as follows:

- Enactive – through a sequence of actions
- Iconic – through a series of illustrations
- Symbolic – through a series of symbols

TPACK (Technology, Pedagogy, and Content Knowledge)

One of the more popular technology integration models is the *Technological, Pedagogical Content Knowledge (TPACK)* espoused by Mishra and Koehler (2006), which sets directions for describing use of technology in learning and in other professional work. This framework highlights and describes the complex relationships between three forms of knowledge, namely: Pedagogical Knowledge (PK), Content Knowledge (CK), and Technological Knowledge (TK)
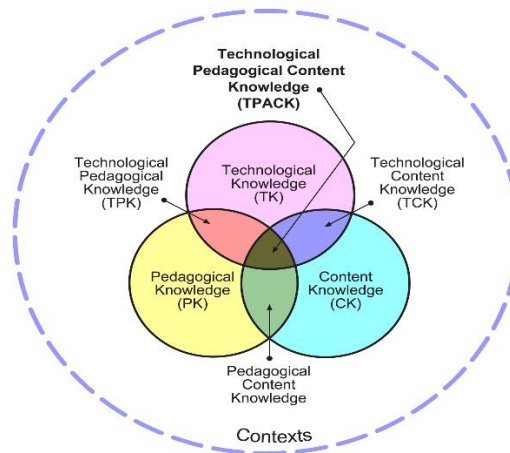
matt-koehler.com/tpack2/tpack-explained (Retrieved 10 August 2020)

Effective technology integration for pedagogy around specific subject matter requires developing sensitivity to the dynamic, transactional relationship between these components of knowledge situated in unique contexts. Individual teachers, grade-level, school-specific factors, demographics, culture, and other factors ensure that every situation is unique, and no single combination of content, technology, and pedagogy will apply for every teacher, every course, or every view of teaching (MKoehler:2012).

Benjamin Brigham: TPACK: Connecting Technology, Pedagogy and Content, https://www.youtube.com/watch?time_continue=25&v=FNf-4efmKWI&feature=emb_logo

APPLICATION / ASSESSMENT

Reflective Writing

✓ Illustrate the Cone of Experience by giving specific examples of learning activities in your field of specialization area. Be able to indicate the topic and how the learning activity will be conducted.

MODULE 4: Enhancing Learning with Various Forms of Media
(Visual and Audio)

TOPIC FRAMEWORK

- Learning with Visual Media
- Learning with Audio Media

LEARNING OUTCOMES

After the successful completion of this module, the student must be able to:

- Design and use visual media in instruction for accurate interpretation of learning information.

- Illustrate possible use of audio media in the teaching field and how they are used effectively.

ACTIVITY TASK # 4

Online Learning	**Offline Learning**
✓ Create a photo gallery showing variety of visual media used in the teaching and learning particularly in your field of specialization area. Upload your file in the Activity Folder of your e-portfolio. ✓ Playback and listen to a song that will best describe what is the world's present situation. Prepare a podcast or audio recording of about the song by including in the recording content the title, the singer/songwriter and your justification of why you have chosen the song. Include also one-minute audio clip on your most favorite part of the song. Upload your file in the Activity Folder of your e-portfolio	• Create an interesting photo collage using cut out pictures from magazines or newspapers and paste them in the Activity Section of your Portfolio notebook. • Playback and listen to a song that will best describe what is the world's present situation. Write about the song by indicating the title, the singer/songwriter and your justification of why you have chosen the song. Include the lyrics on your most favorite part of the song. Do this in the Activity Section of your Portfolio notebook.

ANALYSIS

➢ What are the different forms of visual media?
➢ What is the role of audio media in learning?
➢ How important are the visual and audio materials in teaching concepts of a lesson?

ABSTRACTION

The term "media" was first used to describe the newspaper more than two centuries ago. Media can be also referred to as "instructional materials". Media are generally defined as the means by which information is conveyed from one place to another. These help the teachers to create engaging, effective, and efficient ways of learning for the students. The media allows the teacher to facilitate the transfer of knowledge to the students.

LEARNING WITH VISUAL MEDIA

Visual == the conveyance of ideas and information in forms that can be read or looked upon.

Forms of Visual Media

1. **Non projected visuals** == are those media which are used without any projection, so they translate abstract ideas into a more realistic format. They allow instruction to move from verbal representation to a more concrete level.
    a. *two – dimensional objects* – materials viewed in flat surface, in width and length, which are lacking in depth or volume
    b. *three – dimensional objects* – refers to realistic visuals because either they show the actual object under study or they are objects that can be viewed and handled in a learning setting. They represent solid objects that can be measured in length, width, and height, giving the illusion of depth or varying distances. These materials come in the form of contrived experiences, which are edited versions of what is real.

2. **Projected visuals ==** when teachers provide visuals such as photographs, drawings, charts, graphs, or posters, she needs a way to show them. Visuals may be displayed in the classroom in a variety of ways, ranging from simply holding up a single visual at hand to constructing elaborate exhibits for permanent display. Classroom surfaces commonly used for display of visuals include whiteboards, bulletin boards, cloth boards, magnetic boards, and flip chart.

Types of Non-projected (Two – dimensional) Visual Media

o **Textual Presentation** -- refers to data presented in written, paragraph form. The style of lettering serves its purpose when making attractive textual presentations for visual media.

o **Photographs / Pictures** == photographic representations of people, places, and things. They are readily available on the Internet and in books, magazines, and newspapers.

o **Flash cards** -- are small cards with picture or symbol on them used in teaching. Drills are very important means of fixing the skills and memorizing the responses of students.

o **Graph** == a diagram (such as a series of one or more points, lines, line segments, curves, or areas) that represents the variation of a variable in comparison with that of one or more other variables.

- o **Chart** == a diagram, picture, or graph which is intended to make information easier to understand.

- o **Diagram** == a graphic design that explains rather than represents; a drawing that shows arrangement and relations (as of parts).

- o **Graphic organizers** == are visual displays of key content information designed to benefit learners who have difficulty organizing information (Fisher & Schumaker, 1995). They demonstrate the relationship between facts, ideas and concepts.

- o **Drawings** == employ the graphic arrangement of lines to represent persons, places, things, and concepts.

- o **Sketch** == a rough drawing representing the chief features of an object or scene and often made as a preliminary study.

- o **Cartoon** == a humorous drawing or series of drawings in a newspaper or magazine.

- o **Comic strip** == a series of drawings that tell a story, especially in a newspaper or magazine.

- o **Poster** -- any piece of printed paper design to be attached to a wall or vertical service. Posters are design to be both eye-catching and convey information.

- o **Wall Chart** == a type of large poster often displaying information for educational use or entertainment. They can be found on a variety of different topics from geography to grammar or to science.

- o **Map** == a visual representation of an area—a symbolic depiction highlighting relationships between elements of that space such as objects, regions, and themes. It is usually shown on flat surface.

- o **Infographic** == according to the Oxford English Dictionary, an infographic (or information graphic) is "a visual representation of information or data". It represents a collection of imagery, charts, and minimal text that gives an easy-to-understand overview of a topic, or quickly and clearly present an information. They can improve cognition by utilizing graphics to enhance the human visual system's ability to see patterns and trends on data visualization, statistical graphics, information design, or information architecture.

Types of Non-projected (Two – dimensional) Visual Media

- o **Models** == a recognizable 3-D representation of a real thing or object. It is a scaled representation which may be equal to, smaller or bigger than the actual size of the original object.

Classification of Models

1. *Solid models* -- are usually used for recognizing external features as in the case of gloves and puppets
2. *Cross – section models* == show the internal structure such as that of a tree that shows the pith and other external parts
3. *Construction models* == can be assembled and disassembled and show the relationships of parts to the whole
4. *Working models* == such as machines which indicate how an object represented operates

o **Globe** == the most widely used model; very useful in developing concepts relating to the earth's shape, the earth's relationships with other bodies in space, the comparative sizes of nations and continents, of longitudes and latitudes, of time relation and distance.

o **Diorama** == a miniature 3D foreground and a flat background intended to represent a real-life scene

o **Realia / Real Objects** == actual or real objects from their normal setting are taken to the classroom for study and analysis

o **Specimen / Sample** == fragments of the original objects

o **Popups** == books that contains one or more pages such that a three-dimensional structure rises when a page is opened.

o **Mockup** == intended to show the essential parts which are made detachable to focus on a specific part of the whole object.

The non-projected visuals, whether in two-dimensional or three-dimensional formats can be collectively viewed in a/n:
o **Exhibit** == are collections of various objects and visuals designed to form an integrated whole for instructional purposes.
o **Museum** == a building or institution which cares for a collection of artefacts and other objects of scientific, artistic, or historical importance, and makes them available for public viewing.

Advantage of Seeing Museum

➢ Students can see the actual objects and artefacts.
➢ A field trip experience for the students.

Disadvantage of Seeing Museum

➢ Entrance fee of some museums are quite expensive.
➢ Some places inside are forbidden.
➢ Some objects are not allowed to be touched.
➢ A big responsibility for the teachers to keep his/her eyes on students during the trip.

Advantages of Visual Aids

- Add impact and interest to a presentation.
- Serves as key tools in learning and development.
- Tends to be more interactive.
- Helps emphasize a point.
- Visual aids can quickly and efficiently demonstrate ideas that are difficult to explain verbally.
- A picture is worth a thousand words.

Disadvantages of Visual Aids

- Presenters may depend on them to teach a subject.
- Too many ideas in the image will confuse and distract the main idea.
- Using same form of visual aid will decrease its effectiveness.
- It runs the risk of making passive learners.
- Time consuming in preparation.
- Technological concerns.

LEARNING WITH AUDIO MEDIA

Audio aids stimulate the listening skills of the learner when presenting a lesson. Learning using audio or sounds to deliver and express information, emotions, makes it more effective and suitable for specific situations.

Forms of Audio Media

- **Radio Program --** The Philippine Educational Broadcasting started when the Japanese used radio to teach Filipinos the Japanese language during World War II. It began with university experiments in the use of radio in "distance learning" projects. It was designed to reach provincial farmers who could not afford regular school attendance due to lack of funds or the distance of their homes from schools.

Educational Radio Broadcasting in the Philippines

Two Categories of Learning Enhancement: Instructional and Educational

1. *Instructional Broadcasting* -- usually targets adults who wish to learn more about a certain craft or trade. It also aims to give information to rurally situated families which would help improve their lives.

2. *Educational Broadcasting* -- targets children and serves to enrich classroom learning. It features programs which aim to reinforce lessons learned in school and are usually entertaining as well as educational.

- **Audio Tapes, Compact Discs and Audio Recordings / Clips**

1. *Audio Tape* == audio tape recorder, tape deck or tape machine is an analog audio storage device that records and plays back sounds, including articulated voices, usually using magnetic tape, either wound on a reel or in a cassette, for storage. The use of magnetic tape for sound recording originated around 1930.

    Recorder – any electronic device used to make a permanent record of audio information such as tape recorder, optical disc, or phonograph.

2. *Recording* ══ the process of converting the acoustic energy sounds into some form that can be permanently stored and reproduce any time. Types can be in the form of cassette tapes, open reel tape, gramophone record, and compact disc.

3. *Compact Disc* ══ an optical disc used to store digital data, originally developed for storing digital audio; other digital information is stored and from which the information can be read using reflected laser light.

- **Audio Clips, Record Dubbing**

  1. *Audio Clip* ══ stores the audio file either compressed or uncompressed. Short audio clips can help illustrate a key point in a lecture or support an argument in a presentation or media assignment.
  2. *Dubbing* ══ is the transfer or copying of previously recorded audio material from one medium to another of the same or different type. The purpose of dubbing may be simply to make multiple copies of audio programs or may be done to preserve programs on old media which are deteriorating.

- **Audio Equipment** -- any device designed principally to reproduce, record or process sound.

  1. *Radio* – the transmission of signals, by modulation of electromagnetic waves with frequencies below those of visible light.
  2. *Record player* -- a device used to play recorded sounds. They are suited for both musical and spoken recordings.
  3. *Cassette tape* -- is a French word meaning "little box"; a small device for playing back or recording magnetic tapes. An important use of tape player is the recording of a certain produced sounds.
  4. *Radio Receiver* -- an electronic circuit that receives its input from an antenna uses electronic filters to separate a wanted radio signal from all other signals picked up by this antenna.
  5. *Microphone* ══ an instrument for converting sound waves into electrical energy variations, for the purpose of transmitting or recording sound (such as speech or music)
  6. *Loudspeaker, or speaker* -- is an electromechanical transducer that converts an electrical signal to sound.
  7. *Compact Disc player* -- (often written as compact disc player), or CD player, is an electronic device that plays audio compact discs.
  8. *Amplifier* ══ an electronic device (as in a stereo system) for increasing the amplitude of electrical signals, such as voltage, current, or power used chiefly in sound reproduction
  9. *iPod* ══ was meant as a multimedia device for the masses. However, it did not take long for tech - savvy teachers to find ways to use the iPod in the classroom. It is portable, interactive, and might not cost as much.

Advantages of Audio Learning Devices

➢ Means of motivation and vitalizing teaching and learning.
➢ Storing, retention, and retrieval of information can be made possible.
➢ The students may easily, clearly understand, appreciate, and apply what they have heard.

Disadvantages of Audio Learning Devices

➢ The students must broaden their imagination.
➢ They must give their full attention while the material is playing.
➢ More expensive materials compared to ordinary or traditional materials.

APPLICATION / ASSESSMENT

✓ Pretend that you will be conducting a lesson in your field of specialization. Select any type of visual media that you will utilize to best explain the concept of your lesson. After preparing your visual media, take a picture of it and paste/upload it together with your **Reflective Writing** journal.

✓ Why is it significant to incorporate audio media in instruction?

MODULE 5: Enhancing Learning with Various Forms of Media
(Audio – Visual and Manipulative)

TOPIC FRAMEWORK

- Projected Media and Display Technologies
- Learning with Audio Visual Media
- Using Manipulative in the Classroom

LEARNING OUTCOMES

After the successful completion of this module, the students must be able to:

- Utilize appropriate display technologies as tools to impart concepts on specific subject matter.

- Explain how learning is enhanced with the application of audio-visual media in each instructional domain.

ACTIVITY #5

Online Learning	**Offline Learning**
✓ Search for any video maker software and create a 3 – minute video for a particular topic in your field of specialization. Upload your file in the Activity Folder of your e-portfolio.	• Watch any educational television program that features a particular topic in your field of specialization. Prepare a written report about the television program you have watched. Provide details such as the title of the program, host, channel station, timeslot of airing, and the featured story. Relate the featured story to your field of specialization topic. Write your report in the Activity Section of your Portfolio notebook.

ANALYSIS

- ✓ When two or more senses are being utilized when presenting lessons, what will be the implication of these media to the instructional materials?
- ✓ How significant is the role of manipulatives in the learning of a toddler?

PROJECTED MEDIA AND DISPLAY TECHNOLOGIES

There are many ways to view visuals in the classroom. Display surfaces can be used for viewing visuals or still images may be enlarged and displayed on a screen by sending images from a computer or other projected devices.

Types of Display Surfaces

- **Chalkboard** ==a hard or rigid surface made of a smooth usually dark substance, used for writing or drawing on with chalk, especially in teaching.

- **Flannel board / Felt board** == a display board covered with flannel or felt to which suitably backed matter (as for the illustration of a lesson or lecture) adheres when pressed firmly in contact).

- **Cork board** == a heat-insulating material made of compressed granulated cork

- **Whiteboard** == a board with a smooth, white surface, often attached to a wall, on which you can write and draw using special pens.

- **Magnetic boards** == surface made of ferromagnetic material with specially - painted light surfaces on which material can be written or drawn using suitable markers or pens.

- **Flip chart** == consists of a series of large pieces of paper which are attached at the top and which are used to present information to an audience by turning over one piece of paper at a time.

- **Bulletin board** == which is usually attached to a wall in order to display notices giving information about something.

Contemporary Projected Devices or Equipment

- **Digital Video Disc Player** == is a device that plays discs produced under both the DVD-Video and DVD-Audio technical standards, two different and incompatible standards. Software DVD players are programs that allow users to view DVD videos on a computer with a DVD-ROM drive.

- **Portable DVD Player ==** since most hardware DVD players have to be connected to a television, there also exist portable devices which have attached LCD screen and stereo speakers. Portable DVD players are often used for long road trips and other travels.

- **Television ==** a telecommunication medium for transmitting visual images and sound that are reproduced on screens, chiefly used to broadcast programs for entertainment, information, and education.   It telecasts important programs having educative value for mass people and pupils in general.

- **Digital Camera ==** a camera that takes pictures without using film; a camera that records images as digital data instead of film that can be connected to a computer for larger viewing screen.

- **Document Cameras ==** also known as visual presenters, visualisers (in the United Kingdom), are real-time image capture devices for displaying an object to a large audience.

- **Digital Projector ==** an electronic device that can connect to a computer or other device and projecting the video output onto a screen or wall. Commonly known as LCD projector is a type of projector based on liquid crystal displays which can display images, data or video. An LCD projector works on transmissive technology. LCD projectors are more popular than many alternatives because they are cheaper to produce and have excellent color reproduction.

LEARNING WITH AUDIO – VISUAL MEDIA

This refers to any electronic media format that employs "motion pictures" to present a message can be referred to as video that incorporates the element of sound which is the audio.

- **Audio/Video ==** is frequently used as a generic term for the audio and video components and capabilities in home entertainment system and related product descriptions and reviews involving the use of recorded pictures and sound, or the equipment that produces them.

- **Educational Televisions ==** the use of television programs in the field of distance education may be in the form of individual television programs or a dedicated television channel.

- **Cablecast Network Programs ==** a "cable channel" (sometimes known as a "cable network") is a television network available via cable television that transmits directly to receivers by means of coaxial cable, a cablecast program.

- **Film ==** also called a movie, motion picture, theatrical film, or photo play, is a series of still images that when shown on a screen create an illusion of motion images.

Benefits of Using Educational Video in the Classroom

➢ generates a much greater amount of interest and enjoyment more than the traditional printed material
➢ much easier to understand the diverse cultures of people who live in other areas of the world
➢ challenge students to predict the outcome of a video presentation

➢ Educational video can extend the learning beyond the textbook.

Limitations of Using Educational Video in the Classroom
➢ can cause students to lose focus

➢ movies may sometimes take too much time
➢ the educational part may only be a small portion of the overall movie

Multimedia == content that uses a combination of different forms such as text, audio, images, animations, video and interactive content.

Advantages of Using Multimedia

➢ ability to bring in images, sounds and videos without leaving the room
➢ use of images, along with words, diminishes the overwhelming nature of text and helps the student to manage the cognitive load, which increases retention
➢ creates a professional look and feel to the presentation

Disadvantages of Using Multimedia

➢ students who are not as proficient with technology may have to spend more time learning computer skills to access information than focusing on course materials
➢ requires the significant aid of the following: appropriate software to playback the multimedia, and projecting tools such as projector, laptop, screen and audio equipment

USING MANIPULATIVES IN THE CLASSROOM

Manipulatives are physical tools of teaching, engaging students visually and physically with objects such as coins, blocks, puzzles, markers, etc. These physical tools are used as teaching aids to engage students in the hands – on learning.

Forms of manipulatives vary from models, real objects, or interactive multimedia software.

Principles for Maximizing the Effectiveness of Manipulatives

1. *Use a manipulative consistently over a long period of time.* Consistent, prolonged use of the same or similar manipulatives promotes deeper insights into how the material relates tot eh concept.

2. *Begin with highly, transparent concrete representatives and move to a more abstract representations over time.* Instruction should progress to the use of more abstract representations over time. This idea makes the mapping between materials and the concepts they represent to better understand the relation between them.

3. *Avoid manipulatives that resemble every object or have distracting, irrelevant features.* Manipulatives that represent real objects may impede learning.

4. *Explicitly explain the relation between the manipulatives and the concept.* Statements about how the material represents the concept helps direct attention of the learner to the relevant features of the materials. Although kinesthetic experiences can enhance perception and

thinking, understanding of concepts can only be developed independently, thus, manipulatives can enhance perception and thinking.

APPLICATION / ASSESSMENT

Reflective Writing

✓ Cite examples to justify how important are multimedia or the use of audio – video technologies in the delivery of instructions.

✓ Do you think it is proper to utilize the videos captured without permission and upload them online to make them as "viral features"?
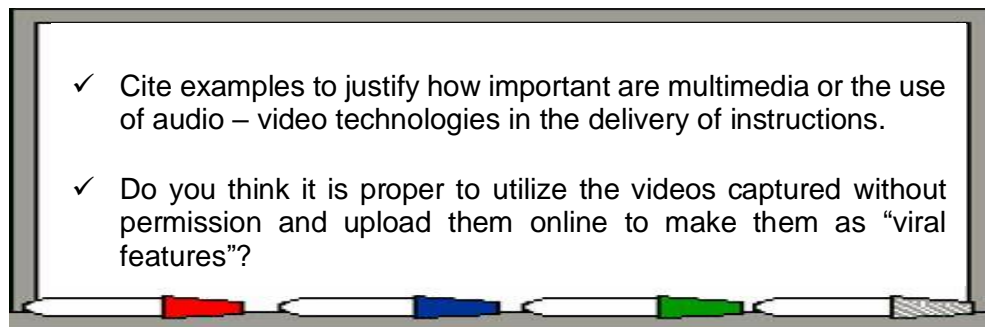
MODULE 6: Engaging Learners with Computers

TOPIC FRAMEWORK

- Teacher and Student-Centered Strategies
- Computer – Aided Instructions
- Productivity Suite and Academic Software
- Digital Technologies in the Classroom

LEARNING OUTCOMES

After the successful completion of this module, students must be able to:

- Select and integrate computer resources into instruction to promote student learning.
- Discuss the benefits and limitations of using digital technologies in the classroom.

ACTIVITY #6:

Online Learning	Offline Learning
✓ Create a photo gallery showing variety of digital tools and emerging technologies associated in the use of ICT. Upload your file in the Activity Folder of your e-portfolio.	• Create an interesting photo collage of the digital tools and emerging technologies associated in the use of ICT by providing cut out pictures from magazines or newspapers and paste them in the Activity Section of your Portfolio notebook.

ANALYSIS

- ✓ How significant is the use of computer to greatly improve the delivery of instructions?
- ✓ What software applications are necessary to be learned by the preservice teachers?

ABSTRACTION

TEACHER AND STUDENT – CENTERED STRATEGIES

The explosion of information available in the 21st century requires teachers to create learning environments that engage this new generation of students in authentic experiences that promote increased knowledge and skills and a better understanding of the world around them. The advent of computers in educational technology has greatly revolutionized teaching methodologies and strategies. Teachers are no longer viewed as the prime source of information. Because of the advent of computer technology, there has been a vast change in educational setting.

Computers have become one of the key instructional technologies in education. It plays multiple roles within the curriculum, ranging from tutor to student creativity resource. Teachers

can use the compute as an aid to collect student performance data as well as to manage classroom activities.

Using Computers in the Classroom

- **Computer** == is an electronic device that can execute instructions or commands to accept data (input) and process them to produce and store useful information (output).

- **Computer literacy** – can be explained as the ability to use computers and technology efficiently. (Wikipedia:2009). It has also been described as skill in applying computer software to achieve desired outcomes, such as using word processing program to write, edit, and complete a document.

     Computer literacy also includes knowing the components of the computer and how they operate. It also entails the ability to recognize a problem and even troubleshoot the computer system if necessary.

- **Computer-based Instruction** -- in education refers to using computers as a central part of the educational experience. Teachers use educational websites and software to enhance daily classroom curriculum.

- **Computer System** == a collective reference to all interconnected computing hardware, including processors, storage devices, input and output devices, and communications equipment.

  Components of the Computer System

  - *Hardware* – composed of the physical devices of the computer system including digital circuitry (input, processing, output, storage devices)
  - *Software* – consists of programs, languages, and instructions which direct the functions of the hardware and provide solutions to problems based on the tasks performed by the user.
  - *People ware* -- individuals who keep the computer system working. They are the persons who create and operate the system as well as the users who benefit from the system.
  - *Data ware* – collection of raw facts or figures when processed would result to information.
  - *Procedure* – knowledge, processes, methods, and steps used by people to perform designated computer tasks.

Advantages of the Computer in Teaching and Learning

- There is a positive climate for learning especially for slow learners.
- Computer encourages students to use cognitive learning strategies and critical – thinking skills. Students control how and when the computer provides them with the information they need.
- Color, music, and animated graphics add realism and appeal to drill exercises, laboratory activities, simulations, and others.
- Progress in learning is easily monitored with the records keeping ability of computers. Teachers can prepare lessons for all students and monitor their progress accessibly.

- Computer resources allow students to manage the rate and sequence of their learning, giving them more control over outcomes. High – speed personalized responses to learner actions yield immediate feedback and reinforcement.

Disadvantages of the Computer in Teaching and Learning

- Computerized instruction is relatively expensive. The cost and benefits must be assessed to ensure optimal gains.
- High quality direct instructional materials are not readily available and may require compatibility due to exclusiveness of some educational programs or software.
- The novelty effect associated with Computer Assisted Instructions may decrease as computers are made more easily available at home and in the workplace. Also, development of such software is in a fast – paced mode that they become outdated in a short period of time, requiring new software applications to be installed.
- Copyright issue is a vital concern with which software and other digital information can be duplicated without permission.
- Users, both learners and teachers, may have high, unrealistic expectations for computers. Many view computers as magical and expect learning to happen at an instant, making little or no effort at all anymore.
- More advanced and complex programs may be difficult to use, specially for student production, because they require the ability to use perform them. Teacher – training is also needed to be able to acquire the necessary computer literacy and skills in order to pass them to their students.
- Lack of structure. Students whose learning style requires more structured guidance may become frustrated. Students may also make poor decisions about how much information to explore.

Teacher – Centered Strategies

1. Presentation
2. Demonstration
3. Drill – and – Practice
4. Tutorials

Student – Centered Strategies
1. Discussion
2. Cooperative Learning
3. Games
4. Simulations
5. Discovery Learning
6. Problem Solving

COMPUTER-AIDED INSTRUCTIONS

It is the use of computers and software applications to teach concepts or skills. The computer serves as an easy – to – use device to reinforce classroom instruction.

1. **Drill and Practice --** exercises designed to increase fluency in a new skill or body of knowledge or to refresh an existing skill or body of knowledge.

➢ Good programs provide user control, give feedback and reinforcement, and help learner's master skills.
➢ Good for basic skills/knowledge where rapid student response is desired.
➢ Usually best to use in a series of brief sessions.
➢ Mainly intended for use by individuals.
➢ Should be geared to a level appropriate for the students.

2. **Tutorial --** computer assumes the role of a tutor -- introducing content, providing practice, and assessing learning.
   ➢ Tutorials are used to introduce new content to learners in much the same manner that a human teacher might.
   ➢ Because tutorials present content to students, they can be used in any area of the curriculum for:
     o Remediation when learners lack necessary background knowledge.
     o Enrichment when learners wish to go beyond the basics.
     o Introduction of content to all learners (freeing the instructor to do other things).
   ➢ Good for verbal and conceptual learning.
   ➢ May require significant investment of students' time.
   ➢ Can be effectively used by individuals or groups of 2-3 students.
   ➢ Should be followed by opportunities for student application of knowledge.

3. **Simulation –** provides a controlled learning environment that replicates key elements of real – world experience, a real situation, phenomenon, or process.
   ➢ Provides the opportunity for students to apply knowledge in a realistic format but without the time, expense, or risk associated with the real thing.
   ➢ Simulations can mimic physical objects or phenomena, processes, procedures, and situations.
   ➢ Best used for application of knowledge, problem solving, and thinking skills.
   ➢ Time involvement may be brief or extended depending on the simulation.
   ➢ Good for small groups of students, although can be used by individuals.
   ➢ Often requires guidance and follow-up for effective use.

4. **Instructional Games --** usually another type of CAI (e.g., drill and practice or simulation) modified to include gaming elements.
   ➢ Generally, they feature end goals and rules of play, sensory appeal, and motivational elements (e.g., competition, cooperation, challenge, fantasy).
   ➢ Usually, they are aimed at younger learners such as those in the elementary grades.
   ➢ Games can substitute for worksheets and exercises, as a reward, or, in some cases, to foster cooperation.

5. **Problem Solving --** designed to foster thinking or problem solving skills, but does not fit into one of the other categories.
   ➢ Usually focuses on a specific type of problem solving and provides practice on a number or variety of problems.
   ➢ Problem solving applications sometimes focus on specific topics areas (e.g., mathematics, science) and sometimes they are designed to promote general problem-solving abilities (e.g., pattern recognition, prediction).

Advantages of CAI

- Interactive
- Provides immediate feedback.
- Infinitely patient
- Motivates learners
- Provides consistency in presentation.
- Can adjust difficulty to level of learner.
- Able to branch to provide appropriate content presentation to the learner.
- Can present concepts or processes dynamically and using multiple forms of representation.
- Can maintain records of student performance.
- Frees the instructor to do other things.
- It can store the performance of the learner for future use or further fine-tuning.
- It can be adjusted depending on the level of the learner.
- It involves dynamic processes and can use multiple forms of presentation.
- It generally requires less time than traditional methods

Limitations of CAI

- Equipment and software can be costly.
- Development takes time and money.
- Not all learning outcomes are well addressed by CBI.
- Unsophisticated applications may not make good use of the computer.
- Overly simplified applications might not be as effective and may not make good use of the computer.
- Their development is time-consuming and can be quite costly.
- Not all subjects or fields can be assisted or supported by CAI.
- It might have limited modalities, unless developed by experts and with the use of multimedia

PRODUCTIVITY SUITE AND ACADEMIC SOFTWARE

1. **Productivity *software* –** is typically generic business application software that educators can use and adapt for the administrative and professional tasks. Word processing, spread sheet, and database management software are all examples of productivity software.

- Word Processors
- Electronic Spread sheets
- Database Management Software
- Presentation Software
- Integrated Productivity Packages / Suite **–** packaged application suites of programs that share a similar look and feel. An integrated package contains the most popular and widely used components of each major type of productivity tool.

2. **Academic Software --** enriches the teaching and learning process. It includes the wide variety of software packages that can be used to enrich the teaching and learning environment for both teachers and students.   It may include packages that help the teacher teach and those designed to help the learner acquire targeted competencies.

- *Desktop Publishing*
- *Graphics Software*
- *Clip Art*
- *Illustration Software*
- *Paint programs*
- *Draw programs*
- *Imaging/Editing*
- *Reference Software*
- *Authoring Systems*

3. **Interactive Software** == refers to software which accepts input from humans as it runs. Interactive software includes most popular programs, such as word processors or spreadsheet applications.

Advantages of Interactive Software

- students' control on their own learning experience
- help students to use all of their senses to extract information and develop a positive attitude towards technology
- teach self-confidence and self-esteem of students when being connected online to join collaborative learning

Disadvantages of Interactive Software

- software needs to be carefully chosen to ensure that what is holding student's attention
- not enough computers for every student for everybody's participation
- muscular-skeletal injuries and vision problems can arise whenever students spend too much time using the computer

DIGITAL TECHNOLOGIES IN THE CLASSROOM

Input Devices for Teaching and Learning

- Scanners
- Digital cameras, digital video cameras, web cameras
- Graphics tablets, stylus, digitizers
- Microphones
- Pen Input devices such as personal digital assistant (PDA) or a tablet PC
- Touch Screens, Laptops, Tablets
- Clickers
- Smartphones
- Electronic Whiteboards
- Bluetooth technology
- Wireless devices
- E – book readers
- Voice – activated, face recognition devices

Output Devices for Teaching and Learning

- Data Projectors
- Scan converters
- Speakers and Headphones
- WiFi and Hotspot routers

APPLICATION / ASSESSMENT

Reflective Writing

✓ What will happen to a world without computers? Describe your learning situation right now, taking into consideration if you are aided by a computer or not.
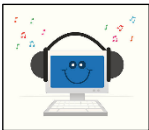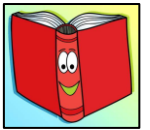
MODULE 7: Educational Media Center

TOPIC FRAMEWORK

- Roles and Functions
- Human, Technological, and Material Resources
- Characteristics of a functional Educational Media Center

LEARNING OUTCOMES

After the successful completion of this module, the students should be able to:

- Value the significance of a self – contained environment designed to promote student learning.

ACTIVITY #7

Online Learning	**Offline Learning**
✓ Create a Slide Show presentation of different designs or layouts of an engaging and interesting Educational Media Center. Upload your file in the Activity Folder of your e-portfolio.	• Recall a time in your student's life when you have personally visited an Educational Media Center. How was the experience being in that place back then? Write your reflections in the Activity Section of your Portfolio notebook.

ANALYSIS
- ✓ What is the role of Educational Media Center in the teaching and learning process?
- ✓ What specific material resources can be found in an EMC?

ABSTRACTION

EDUCATIONAL MEDIA CENTER -- serves as a location for an adequate pool of available technology resources or educational materials in the institution and follows a systematic way of arranging them for easy borrowing and retrieval. Acquisition and distribution of the different forms of educational media used in the teaching – learning process is not only a vital instrument of quality education but also a requirement of quality education.

https://www1.pgcps.org/ernesteverettjust/index.aspx?id=32318

HUMAN, TECHNOLOGICAL, AND MATERIAL RESOURCES

- o **Human Resources** – includes a director who is in-charge of maintaining and delivering the services offered by the center; the technician, who is adept in manipulating, using and, who can trouble shoot simple problems that may arise in using different equipment; the librarian, who is in charge of filing or arranging systematically the different instructional

media for easier identification' and the artist, who assist the teachers and students in producing unavailable instructional materials. They are also expected to give consultation services to improve instruction, the use of appropriate educational media, and to give new information on the most recent trends of educational technology.

- o **Technological Resources** - *refers* to the scientific and specialized knowledge on the use and application of educational media to teaching and learning. These would mean the brochures, flyers, information sheets, bulletins and other to guide and inform teachers, students and the community of the services the EMC can offer. These may also include upgraded research, investigation and exploration on the use of media materials not only to education but to other facets of life for the benefit of the community as well.

- o **Material Resources** – the different instructional materials which are arranged systematically for easy access.

http://douron.com/wp-content/uploads/2017/10/Douron_15-1.jpg

ROLES AND FUNCTIONS OF EDUCATIONAL MEDIA CENTER

1. Consultant services to improve instruction, learning and the use of educational media resources and facilities
2. Creation, production of instructional materials and upgrade of instructional standards to suit the special needs of teachers and students
3. Information on new educational developments based on research through media support to individual investigation and exploration
4. Multi-media facilities with working areas made available to student, teachers and media staff
5. Educational media equipment made available for classroom use to students and teachers
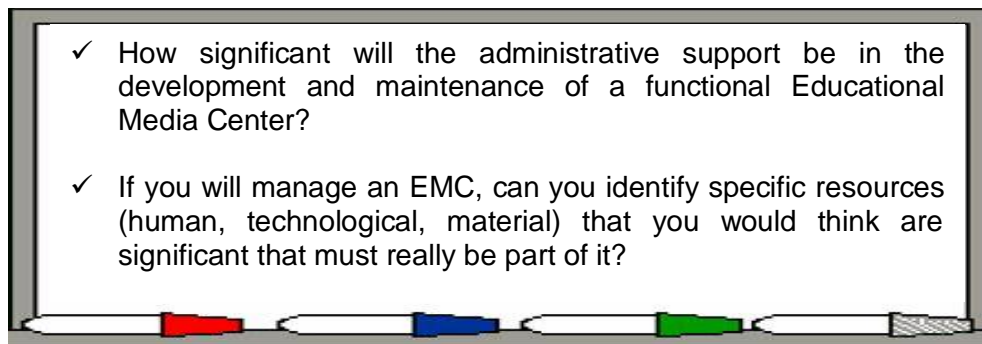
CHARACTERISTICS OF A FUNCTIONAL EDUCATIONAL MEDIA CENTER

- ▪ The EMC has an institutional media program supported by the administration. There is an existing policy on the use of the center.

- ▪ There is a regular budget for the procurement of additional units and for the maintenance of the existing ones.

- The center is manned by qualified staff that can assist teachers and students avail the maximum benefits derived from using the media materials

- Teachers and students are encouraged to use the educational media.

- There is an adequate pool of educational materials an adequate space for storing, filing and producing them.

- There is a systematic way of arranging specific materials for easy borrowing and retrieving system.

- The EMC is well lighted and well ventilated with pro visions for darkening the room when needed as in the case of viewing multi-media presentations or motion pictures.

APPLICATION / ASSESSMENT

Reflective Writing

✓ How significant will the administrative support be in the development and maintenance of a functional Educational Media Center?

✓ If you will manage an EMC, can you identify specific resources (human, technological, material) that you would think are significant that must really be part of it?

MODULE 8: Social, Ethical, and Legal Responsibilities in the Use of Technology Tools and Resources

TOPIC FRAMEWORK

- Digital Citizenship
- Social, Ethical, Legal Issues in the Digital Age
- Netiquette (Social Conventions Online)

LEARNING OUTCOMES

After the successful completion of this module, the student must be able to:

- Promote appropriate and responsible use of technology and exhibit ethical behavior in professional practices.

ACTIVITY #8

	Online Learning		**Offline Learning**
✓ Gather short video clips about the unethical practices of using technologies in the Philippines. Upload these video clips in the Activity Folder of your e-portfolio. Be able to label them properly for identification purposes.		• Gather news article about the unethical practices of using technologies in the Philippines. Identify its author / writer, date of publication in the Activity Section of your Portfolio notebook.	

ANALYSIS
- ✓ How can you be a digital citizen person/?
- ✓ What best practices do you think are necessary for a future educator like you?

ABSTRACTION

DIGITAL CITIZENSHIP

A digital citizen refers to a person utilizing information technology in order to engage in society, politics, and government. K. Mossberger, et.al, (2011) define digital citizen as "those who use the Internet regularly and effectively."

People characterizing themselves as digital citizens often use IT extensively, creating blogs, using social networks, and participating in online journalism. Although digital citizenship potentially begins when any child, teen, and / or adult sign up for an email address, posts pictures online, uses e-commerce to buy merchandise online, and / or participates in any electronic function that is B2C or B2B, the process of becoming a digital citizen goes beyond simple Internet activity.

Three Principles of Digital Citizenship

Digital Citizenship is a term used to define the appropriate and responsible use of technology among users. Three principles were developed by Mike Ribble to teach digital users how to responsibly use technology to become a digital citizen. The three principles include: respect, educate, and protect. He points out nine essential elements of being a good digital citizen including digital access, digital commerce, digital communication, digital literacy, digital etiquette, digital law, digital rights and responsibilities, digital health and wellness, and lastly digital security (Ribble, 2017).

- o *Respect:* elements of etiquette, access, and law are used to respect other digital users
- o *Educate:* elements of literacy, communication, and commerce are used to learn about the appropriate use of the digital world
- o *Protect:* elements of rights and responsibilities, security, and health and wellness are used to remain safe in the digital and non – digital world.

SOCIAL, ETHICAL, AND LEGAL ISSUES IN THE DIGITAL AGE

Once technology is planned for and implementation has begun, many issues and concerns beyond those that are technical arise. A variety of legal, social, and ethical issues result from the use of technologies in schools. Teachers must be aware of these issues to ensure that they create a climate in their classroom that fosters respect for ethics, fairness, and the law as they related to the implementation of technology.

Legal Issues

- ✓ Copyright and Fair Use
- ✓ Digital Privacy
- ✓ Acceptable Use
- ✓ Software Piracy
- ✓ Cybercrime
- ✓ Identify Theft

Social Issues

- ✓ Cyberbullying
- ✓ Cyber defamation
- ✓ Online Social Interaction

Ethical Issues

- ✓ Freedom of Speech
- ✓ Data Privacy
- ✓ Academic Dishonesty
- ✓ Computer Addiction

NETIQUETTE (SOCIAL CONVENTIONS ONLINE)

Netiquette is short for "Internet etiquette". Just like etiquette is a code of polite behavior in society, netiquette is a code of good behavior on the Internet. This includes several aspects of the Internet such as email, social media, online chat, web forums, website comments, multiplayer gaming, and other types of online communication.

E-mail Etiquette

The effective use of e-mail is the responsibility of the sender and the recipients. Here some recommended e-mail etiquette guidelines:

- Confidential messages should contain the word "Confidential" in the subject line.
- Do not send unsolicited e-mail messages or chain mail.
- Never spam others by sending large amounts of unsolicited emails.
- Do not write e-mails using all capital letters.
- The e-mail system is not a group forum to express your personal opinions on the issue of the day. It is a means of communication for transmitting something and not expecting at once to have a response from your message.
- Use "Public Folders" for noticed such as items for sale, campaign, important announcement, want ads, surplus property, retirement notification, etc.
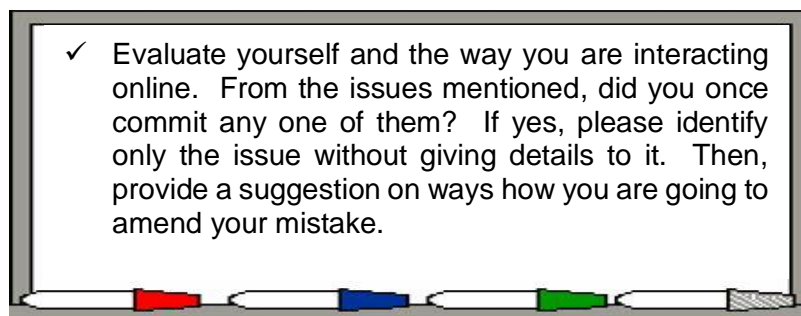
Netiquette

- ✓ Adhere to the same standards of behavior online that you follow in real life.
- ✓ Respect others' privacy by not sharing personal information, photos, or videos without permission from the owner.
- ✓ Respect other people's time and bandwidth. When appropriate, use private messages or email instead of posting to the group.
- ✓ Do not troll people in web forums or website comments by repeatedly nagging or annoying them. Avoid using offensive language as well.
- ✓ Help keep flame wars under control. Do not respond to flame-bait, or post spelling or grammar flames. Break the cycle with a positive post.
- ✓ Stick to the topic when posting in online forums or when commenting on photos or videos.
- ✓ Make yourself look good online. Even is you are not being seen, know what you are talking about and make sense.

The Internet provides a sense of anonymity since you often do not see or hear the people with whom you are communicating online. But that is not an excuse for having poor manners. While some users may feel like they can hide behind their comments, the fact is that they are still the ones publishing the content. Never forget that the person reading your mail or posts, is indeed, a person, with feelings that can be hurt.

APPLICATION / ASSESSMENT

Reflective Writing

> ✓ Evaluate yourself and the way you are interacting online. From the issues mentioned, did you once commit any one of them? If yes, please identify only the issue without giving details to it. Then, provide a suggestion on ways how you are going to amend your mistake.

REFERENCES

Books

Barili, Elomar Christina, et.al, Educational Technology; Magnum Publishing, UC, LB 1028.5.E383 2016, Copyright@2016, ISBN 978-16825-00859

Bernardo, Alejandro, S. & Gonzales, Helen T., Educational Technology I, Rex Bookstore, Inc. Copyright @ 2017, ISBN 978 – 971- 23- 8646 – 6

Eden, Bradford Lee, Enhancing Teaching and Learning in the 21st Century Academic Library; Rowman & Littlefield, Z765.U5.E54 2015, Copyright@2015, ISBN 978-14422-47031

Foreman, Nelly, Changing Face of Education in the Digital Age; Willford Press, New York, LB 1028.3.C43 2016 Copyright@2016, ISBN 978-16828-51449

Habulan, Nenita V., Pedagogical Foundations in Educational Technology, Technology for Teaching – Learning 1, Lorimar Publishing Inc, Copyright @ 2016, ISBN 978-621-8035-05-8

Hill, Jorell, Emerging Patterns of Educational Technology; Koros Press Ltd., Birmingham, UK, LB 1028.3.E44 2014 Copyright@2014, ISBN 978-17816-34219

Lever-Duffy, Judy & McDonald, Jean B.; Teaching and Learning with Technology; Allyn & Bacon – Pearson Education Inc.; Copyright @ 2011; ISBN-13: 978-0-13-800796-6

Lucido, Paz & Corpuz, Brenda B. et.al; Educational Technology Part – 1, 2nd edition; Lorimar Publishing, Inc. Copyright @ 2012; ISBN 971-685-694-1

Narang, Vipul Kumar, Modern Trends in Educational Technology; Astha Publishers and Distributors, LB 1028.3.N37 2015, Copyright@2015, ISBN 978-93821-26720

November, Alan, Empowering Students with Technology; Thunder Oaks, California, Corwin, LB 1028.3.43.N69 2010, Copyright@2010, ISBN 978-14129-74257

Robyler, Margaret, Integrating Educational Technology into Teaching; Ally & Bacon 5th ed, LB 1028.3.R63 2010, Copyright@2010

Smaldino, Sharon E.; Instructional Technology and Media for Learning; Pearson Harlow Essex; LB1028.3.S63 2014, Copyright @ 2014, ISBN 978-12920-21997

Links

https://www.iste.org/standards
https://www.learning-styles-online.com/inventory
Ribble, M. (2017). Digital citizenship: using technology appropriately. https://www.digitalcitizenship.net/nine-elements.html
http://www.readwritethink.org/files/resources/lesson_images/lesson963/Rubric.pdf
TPACK in Two Minutes (https://www.youtube.co/watch?;
http://matt-koehler.com/tpack2/using-the-tpack- image/
UNESCO ICT Competency Framework for Teachers ver. 2.0 (2011); http://www.unesco.org/
https://www.youtube.com/watch?v=UFwWWsz_X9s

RUBRICS FOR ACTIVITY, REFLECTIVE WRITING TASK

MY PERFORMANCE RATING

TASKS	EXEMPLARY 4	SUPERIOR 3	SATISFACTORY 2	UNSATISFACTORY 1
MY DEPTH OF REFLECTION	Reflection statements are profound and clear, show great depth of knowledge of personal thoughts and feelings supported by experiences.	Reflection statements are clear, show depth of knowledge and personal thoughts and feelings, but not clearly supported by experiences.	Reflection statements are shallow; limited personal thoughts were not clearly supported by experiences.	Reflection statements are unclear and shallow; and are not supported by experiences.
MY ANALYSIS	Analysis questions were answered completely; in depth answers; thoroughly grounded on theories. Exemplary grammar and spelling.	Analysis questions were answered completely. Clear connections with theories; grammar and spelling are superior.	Analysis questions were not answered completely. Vaguely related to the theories; grammar and spelling acceptable.	Analysis questions were not answered. Grammar and spelling unsatisfactory.
MY CREATIVITY	Demonstrate substantial efforts and exceeds expectations to project an impressive output with sophistication.	Demonstrate essential efforts to project an impressive output with acceptable sophistication.	Demonstrate limited efforts to project an impressive output with limited sophistication.	Demonstrate little or no efforts to project an output without sophistication.
MY LANGUAGE TECHNICAL ASPECT	Use creative language statements that are precise and engaging, with awareness of audience and purpose, and with excellent grammatically correct structures.	Use appropriate language statements with sense of voice, with some awareness of audience and purpose and with sufficient grammatically correct structures.	Use vague or imprecise language statements for the audience, with little sense of voice, and limited awareness and minimal grammatical correct structures.	Use language statements that is unsuitable for the audience and purpose, with little or no awareness and limited grammatically correct structures.
	Overall Score:		**Rating: (Based on transmutation)**	

Transmutation of score to Grade / Rating

SCORE	GRADE	SCORE	GRADE
16	1.00	10	2.50
15	1.25	9	2.75
14	1.50	8 - below	3.00
13	1.75		
12	2.00		
11	2.25		

_____

Michelle B. Sotto, MEM

PORTFOLIO RUBRIC

ASKS	EXEMPLARY 4	SUPERIOR 3	SATISFACTORY 2	UNSATISFACTORY 1
LEARNING OUTCOMES	• Expected Learning Outcomes were evident on the output submitted • Accurate, and complete information • Complete and correct citation of references	• Some Learning Outcomes were not evident, but some were still appropriate as expected on the output submitted • Somewhat accurate but complete information • Somewhat complete and some correct citation of references	• Some Learning Outcomes were not evident and were inappropriate on the expected output submitted • Somewhat accurate and incomplete information • Somewhat complete and some incorrect citation of references	• Expected Learning Outcomes were entirely not evident on the output submitted • Inaccurate and incomplete information • Incomplete and incorrect citation of references
RELEVANCY OF REFLECTIONS	• Reflection statements are profound and clear, supported by experiences • Thoughtful reflections supported by theoretical foundations provide links between examples and excellent descriptions of statements	• Reflection statements are clear, but not clearly supported by experiences • Reflections supported by theoretical foundations provide links between examples but with unclear descriptions of statements	• Reflection statements are shallow; and few were still supported by experiences • Reflections were not supported by theoretical foundations but provide links between examples and descriptions of statements	• Reflection statements are unclear, shallow and are not supported by experiences • Reflections were not supported by theoretical foundations and descriptions of statements did not provide links between examples and reflections
LOGICAL PRESENTATION OF PORTFOLIO	• Excellent examples of coursework, lessons related to the field of specialization • Portfolio is excellently organized with adequate supporting documentation	• Good examples of coursework, lessons related to field of specialization • Portfolio is well - organized with adequate supporting documentation	• Examples of coursework were presented but mostly lessons were not related to field of specialization • Portfolio is incomplete; supporting documentation is organized but inadequate.	• Examples of coursework were not presented and lessons were not related to field of specialization • Portfolio has many insufficient components; is unorganized and unclear.
	Overall Score:		**Rating: (Based on transmutation)**	

SCORE	GRADE	SCORE	GRADE
16	1.00	11	2.25
15	1.25	10	2.50
14	1.50	9	2.75
13	1.75	8 - below	3.00
12	2.00		