Lecture 1

Teaching and Learning with Technology: An Introduction

A. Introduction

Image 1: Tackling Math with Technology in the Philippines (Source: Cirillo, 2014: Online)

Technology has emerged as a revolutionary educational force, transforming the teaching and learning landscape (Bilbao et al., 2019). New digital tools and platforms have opened up previously unimaginable possibilities for instructors to create engaging, interactive lessons for their pupils. Not only has technology made education more accessible, but it has also transformed the way knowledge is transmitted and acquired through tools like online resources, multimedia presentations, virtual classrooms, and adaptive learning systems. Technological advancements in the school hold great potential for improving student-teacher communication, tailoring instruction to each individual's needs, and preparing students to succeed in a globalized economy.

In this first lecture, we will analyze the significance of information and communication technology (ICT) in teacher education training, determine the competency standards for ICT in pre-service teacher education, and break down the fundamental ideas of ICT so everyone can grasp them.

B. Lesson Objectives

After this lecture, you are expected to:

1. Identify the competency standards of ICT for teaching and learning in pre-service teacher education;
2. Unpack the basic concepts of ICT to provide a common understanding of integrating technology in teaching and learning; and,
3. Determine the significance of technology for teaching and learning in the 21st century and beyond.

C. Lecture Content

1. Competency Standards of Information and Communication Technology (ICT) in Education

The latest standing general principle adopted by the Philippine Commission on Higher Education (CHED) in its policies, standards, and guidelines for the various 2017 teacher education curricula regarding ICT competency standards is the CHED-UNESCO Bangkok Standards of 2009.

Learning competence encompasses an individual's capacity to acquire, understand, utilize, and integrate knowledge, skills, and values across different learning environments. It includes a variety of mental, self-awareness, emotional, and interpersonal abilities that allow people to participate in valuable learning opportunities and adjust to different educational settings.

Educational technology, which offers personalized learning experiences, flexible feedback systems, and interactive tools, helps people become good at learning. Technology makes accessing many learning materials, like online lessons, multimedia presentations, and simulations, easy. This gets people involved and makes them think critically. Students use virtual platforms and collaborative tools to communicate and work with their teachers and peers, which helps them improve their skills. Automated tests give quick feedback, which lets students see how they are doing and change how they are learning. Educational technology offers people the tools they need to succeed in a world that is changing quickly and in many academic and work settings.

With these perspectives, teacher education programs are designed to equip pre-service teachers with the appropriate and adequate perspectives so technology can be maximized as they prepare for professional practice; hence, the ICT Competency Standards for Pre-Service Teachers in seven domains, to wit:

Domain 1: Understanding ICT in Education

Domain 2: Curriculum and Assessment

Domain 3: Pedagogy

Domain 4: Technology Tools

Domain 5: Organization and Administration

Domain 6: Teacher Professional Learning

Domain 7: Teacher Disposition

Domain 1: Understanding ICT in Education

It is intended that the pre-service teachers would show that they know the policies that impact the use of technology in education. They must adhere to these policies to facilitate learning and put technology usage in perspective with the classroom setting and the variety of students.

Teachers who are well-versed in information and communication technologies are expected to actively incorporate these tools into their lessons, adapt their teaching methods to meet the needs of their students, encourage their students to become digital citizens, create stimulating classroom environments that encourage students to work together and think critically, and much more.

Domain 2: Curriculum and Assessment

Teachers need a firm grasp of the theories, concepts, and conceptions of information and communication technology (ICT) systems in the context of education before they can design practical assessment tools. Because each student has unique requirements, they assess online and offline education tools. They study and innovate using ICT technologies and hone 21st-century skills, including effective communication, information, and media literacy.

A teacher who aims to optimize the use of ICT in curriculum and assessment design should ensure that technology is aligned with learning objectives. They should also create interactive and varied learning materials, utilize digital assessment tools, effectively monitor student progress, and ensure that technology enhances the learning experience, promoting student engagement and academic success.

Domain 3: Pedagogy

In applying ICT tools, the teacher uses appropriate technological tools for classroom activities in this area to explicitly assist students in resolving complex problems and working together in real-world and virtual settings.

In the 21st century, it is anticipated that technological pedagogy will effortlessly use digital tools and platforms to improve teaching and learning experiences. The objective is to encourage student-centered learning, cultivate critical thinking and problem-solving abilities, enhance collaboration and communication, cater to various learning styles, and promote digital literacy.

Domain 4: Technology Tools

Teachers can demonstrate their proficiency in the technical operations of technology tools and systems when they employ technology tools for teaching and learning. In addition, they generate learning opportunities to contribute to the community of learners.

An adept educator in technology integration displays flexibility and ingenuity in utilizing digital technologies to enrich teaching. They have a high level of proficiency in digital literacy, consistently seeking out and experimenting with new technologies and approaches. They adapt lessons to cater to various learning styles and abilities, creating an inclusive learning environment. Proficient communication and cooperation abilities empower individuals to include students and colleagues in significant educational encounters actively. Their primary focus is student-centered learning, where technology enhances critical thinking, problem-solving, and creativity. They also use digital tools to provide timely feedback and evaluation, successfully tracking student development.

Domain 5: Organization and Administration

In this domain, teachers are enjoined to manage technology-assisted instruction in an inclusive classroom environment and to exhibit leadership in shared decision-making using technology tools.

Teachers must skillfully oversee technology-integrated teachings in inclusive classrooms, considering their students' varied needs and learning styles. They act as leaders in collaborative decision-making processes, employing digital tools to enhance communication and collaboration among colleagues and stakeholders. Through inclusive strategies and technology, educators cultivate a setting where students are esteemed and assisted in their educational progression. Moreover, they exemplify digital citizenship and ethical use of technology, enabling students to appropriately traverse the digital realm while advocating for fairness and inclusivity for all learners.

Domain 6: Teacher Professional Learning

Teachers' professional development is crucial for investigating established and upcoming technologies to get further expertise in subject and pedagogical knowledge. They enhance their proficiency in employing technological tools to develop communities of practice and cooperate with peers, colleagues, and stakeholders to obtain information to promote professional learning.

By participating in professional development opportunities, teachers may hone their abilities to integrate technology into their lessons in meaningful ways that inspire students to think critically and gain a deeper understanding of course material. Teachers may empower students to become active participants in their own learning, critical thinkers, and creators of significant connections between concepts by becoming proficient in novel teaching strategies and digital technologies. Teachers may better equip their students to thrive in today's globally interdependent and dynamically changing world by acquiring the knowledge and skills necessary to use technology in meaningful ways that enhance student learning.

Domain 7: Teacher Disposition

Teachers who are proficient in technology exhibit social, ethical, and legal responsibilities in the use of technology tools and resources, and they also have a favorable attitude toward the utilization of technology tools.

Student confidentiality, internet security, and ethical resource management are their priorities. This requires teaching and modeling digital citizenship. Additionally, they follow IP legislation and copyright protection changes. They encourage classroom creativity and active learning with their optimistic outlook on technology. Professional educators employ technology to enhance student learning and prevent interruptions from unethical use.

2. Essential Concepts and Terms in Technology for Teaching and Learning

In the 21st century, educational technology has become a powerful force that is changing how teaching and learning are done. The fundamental principles of this ever-changing discipline comprise a wide range of advancements and approaches designed to improve educational experiences and results. Educational technology includes using digital tools, platforms, and pedagogical techniques to address the changing requirements of learners in a more connected world. This includes customized learning, blended instruction, digital literacy, and adaptive technologies. Concepts such as gamification, augmented reality, and data analytics are crucial in promoting creativity and enhancing student engagement, cooperation, and critical thinking. These concepts also allow educators to construct dynamic and inclusive learning environments.

The discipline of educational technology covers a multitude of concepts and terms that play a crucial role in developing contemporary teaching and learning methodologies. Here are ten of the most essential concepts, which we will also be dedicating full lectures for some of them in the future:

1. Blended Learning. In the context of post-pandemic education, blended learning refers to combining traditional in-person instruction with online learning activities to maximize student engagement and academic performance via the utilization of both approaches.

2. Digital Literacy. The capacity to locate, assess, use, and efficiently produce digital information is called digital literacy. This ability encompasses internet navigation, media literacy, and information literacy.

3. Personalized Learning. Using technology-enabled adaptive learning platforms and differentiated instruction methodologies, personalized learning refers to tailoring learning experiences and instruction to match each student's specific requirements, interests, and learning styles.

4. Flipped Classroom. The term "flipped classroom" refers to inverting the conventional classroom paradigm by presenting educational information online outside of class hours. This allows students to interact with the material at their own pace and uses class time for active learning, debate, and participation.

5. Learning Management System (LMS). This digital platform organizes, delivers, and manages educational material, resources, assessments, and communication inside a centralized online environment. This platform also offers the capability to facilitate blended and distant learning experiences.

6. Assistive Technology. Individuals with impairments can benefit from using assistive technology, which includes devices, software, and applications that are meant to assist them in gaining access to educational resources, participating in learning activities, and accomplishing their academic objectives.

7. Gamification. Gamification is applying the ideas and mechanics of game design to educational settings to improve aspects such as motivation, engagement, and learning outcomes. Badges, points, levels, and reward systems often accomplish this.

8. Adaptive Learning. A technology-driven educational strategy that modifies material, speed, and assessment depending on individual learner requirements and performance data, therefore offering tailored learning experiences and targeted assistance.

9. Augmented Reality (AR) and Virtual Reality (VR). Digital material projected into the real world (augmented reality) or a simulated environment (virtual reality) are examples of immersive technologies. These technologies provide opportunities for learning that are both interactive and experiential across a wide range of subjects and fields of study.

10. Data Analytics and Learning Analytics. The act of gathering, analyzing, and interpreting data created via educational technology and digital learning environments to provide information that may be used to influence decision-making, optimize teaching and learning techniques, and improve student outcomes.

3. The Significance of Technology in the Teaching-Learning Process

Incorporating technology in education is essential, as it provides valuable opportunities to improve student involvement, enable customized learning experiences, and equip learners for success in an ever more digital and interconnected society. Technology acts as a catalyst for creativity, pushing the limits of traditional educational methods and enabling educators to address the varied requirements of learners in the 21st century.

Firstly, technology empowers educators to establish dynamic and interactive learning environments accommodating various learning styles and preferences. By utilizing multimedia presentations, instructional games, simulations, and virtual reality experiences, students may actively participate in the learning process and develop a deep understanding of the topic. This approach promotes curiosity, creativity, and critical thinking abilities.

Furthermore, technology enables customized learning experiences to meet each student's unique requirements and capabilities. Educators may utilize adaptive learning platforms, intelligent tutoring systems, and data analytics tools to monitor student progress, pinpoint areas of learning deficiency, and offer focused assistance and interventions. Through real-time feedback and performance data, instructors may enhance learning outcomes and empower students to assume responsibility for their educational journey by adjusting to material, pace, and instructional tactics.

Moreover, technology promotes cooperation and interaction between students and instructors, surpassing geographical limitations and enabling worldwide connectedness. Online collaboration tools, discussion forums, and virtual classrooms facilitate students' participation in cooperative learning activities, allowing them to exchange ideas and work together on projects. This promotes the

development of cooperation, communication, and interpersonal skills crucial for success in the digital era.

Essentially, technology provides pupils with vital digital literacy abilities needed for effectively navigating the intricacies of the digital realm. By instructing students in critical evaluation, digital resource navigation, and responsible and ethical technology use, educators equip them to become knowledgeable and empowered digital citizens who can effectively employ technology for lifelong learning and professional achievement.

To summarize, the use of technology in education signifies a fundamental change in how teaching and learning occur. This change has significant prospects for improving student involvement, tailoring learning experiences, promoting cooperation, and cultivating crucial digital literacy abilities. By using technology to foster innovation and empowerment, educators may establish dynamic and inclusive learning environments that stimulate curiosity, creativity, and a lifelong pursuit of knowledge among students.

Roles of Technology for Teaching and Learning

There is no doubt that in the modern era, technological advancement across all industries is inevitable. Therefore, schools should not stop improving curricula, pedagogy, learning practice, and other educational tasks integrated with information and communication technology.

This part of the lecture augments the significance of technology for teaching and learning by discussing the three (3) domains of educational technology, according to Bilbao et al. (2019).

1. Technology as a tutor. Technology acts as a tutor by providing individualized learning experiences catered to each student's needs. The technology analyzes student performance data, pinpoints areas for growth, and offers focused teaching and assistance through adaptive learning systems and intelligent tutoring software. This helps students navigate their learning path by providing tools and feedback specifically tailored to them.

2. Technology as a teaching tool. Technology improves instruction by giving teachers access to a wealth of educational resources, enabling tailored instruction, fostering collaboration, and developing digital literacy skills. It offers various instructional approaches, simplifies administrative work, and equips students with the skills they need to succeed in a quickly changing digital environment.

3. Technology as a learning tool. Technology enhances instructional opportunities by providing access to educational resources, interactive platforms, and tailored learning experiences. Learners are given the ability to study a wide range of topics, acquire vital skills, and achieve academic achievement in novel ways because it encourages engagement, makes collaboration easier, promotes critical thinking, and offers rapid feedback.

D. Conclusion

Technology opens up new ways to be creative, get students involved, and give them power. What makes it important is that it can customize learning, encourage teamwork, and teach critical digital skills needed to succeed in the 21st century.

E. References

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