Chapter 1

Integrating Educational Technology into the Curriculum
Chapter Objectives

- Define curriculum-specific learning
- Explain the difference between computer, information, and integration literacy
- Explain the necessity of changing instructional strategies from traditional to new learning environments
- Describe the evolution of computers and digital media
- Differentiate among the various categories of computers
Chapter Objectives

- Explain why computer technology and digital media are important for education
- Describe the National Educational Technology Standards for Teachers (NETS-T) and Students (NETS-S)
- Explain why 21st century skills need to be incorporated in K-12 curriculum
- Describe the characteristics of today’s digital students
- Describe six categories of what today’s students need to know
- Provide examples of how computers are changing the way people teach and learn
Curriculum-Specific Learning

- Learning how to apply teaching principles, knowledge, and ideas to authentic and practical classroom lessons and projects that can benefit your students.
Computer, Information, and Integration Literacy

- Computer literacy
  - Knowledge and understanding of computers and their uses
- Information literacy
  - Knowing how to find, analyze, and communicate information
- Integration literacy
  - The ability to use computers, digital media, and other technologies combined with a variety of teaching and learning strategies to enhance students’ learning
Computer technology and digital media are present in every aspect of daily living — in the workplace, at home, in the classroom, and for entertainment.
What Is a Computer and What Does It Do?

- An electronic device, operating under the control of instructions stored in its memory, that can accept data, process the data according to specified rules, produce results, and store the results for future use.
- A computer is a computational device.
What Is a Computer and What Does It Do?

- **Data** - collection of unorganized facts
- **Information** - data that is organized, meaningful, and useful
- **Input** - data entered into a computer
- **Output** - processed results from a computer

![Diagram showing data processing and output]

**Processes**:
- Computes each course's grade points by multiplying the credits earned by the grade value (e.g., 4.0 * 3.0 = 12.00)
- Organizes data
- Sums all credits attempted, credits earned, and grade points (16.00, 10.00, and 30.00)
- DIVIDES total grade points by credits earned to compute term GPA (3.62)

**Grade Report**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Grade</th>
<th>Grade Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIST-360 A</td>
<td>4.0</td>
<td>A</td>
<td>16.0</td>
</tr>
<tr>
<td>CTPR-269 A</td>
<td>4.0</td>
<td>B</td>
<td>16.0</td>
</tr>
<tr>
<td>HIST-309 B</td>
<td>4.0</td>
<td>A</td>
<td>16.0</td>
</tr>
</tbody>
</table>

Total Credits: 12.00
Total Grade Points: 30.00
Term GPA: 3.62

**OASIS Online Academic System Interactive Scheduling**
What Is a Computer and What Does It Do?

- **Storage** – holding data and information for future use
- **Information processing cycle** – the cycle of input, process, output, and storage
- **Hardware** – the electronic and mechanical equipment that makes up the computer
- **Software** – a series of instructions that tells the hardware how to perform tasks
The Evolution of Computers and Digital Media

- The goal of multimedia computing and communications is to assist individuals in organizing and managing vast amounts of information in various types of media.
- Digital media – technologies that allow users to create new forms of interaction, expression, communication, and entertainment in a digital format.
The Evolution of Computers and Digital Media
Categories of Computers

- Personal computers
- Mobile computers and mobile devices
- Game consoles
- Servers, supercomputers, and embedded computers
Personal Computers

- A computer that performs all of its input, processing, output, and storage activities by itself
Mobile Computers and Mobile Devices

- Mobile Computers
  - Notebook computer
  - Tablet PC
  - Netbook
- Mobile Devices
  - Handheld Computer
  - PDA
  - Smartphones
Game Consoles

- Mobile computing device designed for single player or multiplayer video games
- Controller is the input device
- Television is the output device
- Hard Disks, CDs, DVDs, and memory cards are used for storage
Servers, Supercomputers, and Embedded Computers

- Server
  - Manages the resources on a network and provides a centralized storage area for software programs and data

- Supercomputer
  - Used for tasks such as analyzing weather patterns, tracking hurricanes, and identifying safety issues regarding the space shuttle

- Embedded computer
  - A special-purpose computer that functions as one component in a larger product
Why Use Computer Technology in Education?

- Technology and digital media are everywhere
- Technology can support learning
- Computers support communications beyond classroom walls
- Support of national and international organizations
Why Use Computer Technology in Education?

Chapter 1: Integrating Educational Technology into the Curriculum
The World Is Flat

- *The World Is Flat*
  - Lightning-swift changes in technology and communications put people all over the globe in touch with each other as never before
21st Century Skills

Chapter 1: Integrating Educational Technology into the Curriculum
Computing in the Digital Age

- Digital Students: Who are they and how do they learn?
  - Digital generations – students use different technologies to communicate and to access information from multiple resources
  - Digital students (digital kids)
    - Hypercommunicators
    - Multitaskers
    - Goal oriented
Computing in the Digital Age

Chapter 1: Integrating Educational Technology into the Curriculum
### Computing in the Digital Age

- Digital Students: What they should know
  - Creativity and innovation

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**Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:**

- a. apply existing knowledge to generate new ideas, products, or processes.
- b. create original works as a means of personal or group expression.
- c. use models and simulations to explore complex systems and issues.
- d. identify trends and forecast possibilities.

Computing in the Digital Age

- Gamemake is an example of a software program that allows students to create video games while fostering opportunities for creativity and innovation.
Computing in the Digital Age

- Digital Students: What they should know
  - Communications and collaboration

<table>
<thead>
<tr>
<th>Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. interact, collaborate, and publish with peers, experts or others employing a variety of digital environments and media.</td>
</tr>
<tr>
<td>b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.</td>
</tr>
<tr>
<td>c. develop cultural understanding and global awareness by engaging with learners of other cultures.</td>
</tr>
<tr>
<td>d. contribute to project teams to produce original works or solve problems.</td>
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</tbody>
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Computing in the Digital Age

- Digital Students: What they should know
  - Research and Information Fluency
    - Information fluency is when a person has mastered the ability to analyze and evaluate information

<table>
<thead>
<tr>
<th>Students apply digital tools to gather, evaluate, and use information. Students:</th>
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<tbody>
<tr>
<td>a. plan strategies to guide inquiry.</td>
</tr>
<tr>
<td>b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.</td>
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<tr>
<td>c. evaluate and select information sources and digital tools based on the appropriateness to specific tasks.</td>
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<tr>
<td>d. process data and report results.</td>
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Computing in the Digital Age

- Digital Students: What they should know
  - Critical thinking, problem solving, & decision making

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students:

- a. identify and define authentic problems and significant questions for investigation.
- b. plan and manage activities to develop a solution or complete a project.
- c. collect and analyze data to identify solutions and/or make informed decisions.
- d. use multiple processes and diverse perspectives to explore alternative solutions.

Computing in the Digital Age

- Digital Students: What they should know
  - Digital Citizenship

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**Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students:**

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<tbody>
<tr>
<td>a.</td>
<td>advocate and practice safe, legal, and responsible use of information and technology.</td>
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<tr>
<td>b.</td>
<td>exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.</td>
</tr>
<tr>
<td>c.</td>
<td>demonstrate personal responsibility for lifelong learning.</td>
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<tr>
<td>d.</td>
<td>exhibit leadership for digital citizenship.</td>
</tr>
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Computing in the Digital Age

- Digital Students: What they should know
  - Technology operations and concepts

Students demonstrate a sound understanding of technology concepts, systems, and operations.

Students:

a. understand and use technology systems.

b. select and use applications effectively and productively.

c. troubleshoot systems and applications.

d. transfer current knowledge to learning of new technologies.

Computing in the Digital Age

- ARCS motivational model
  - Developed in 1983 and applicable to learning in the digital age
    - Attention
    - Relevance
    - Challenge/Confidence
    - Satisfaction/Success
## The ARCS Motivational Model and Digital Students

<table>
<thead>
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<tr>
<td><strong>Attention</strong></td>
<td>Lessons are designed to gain students’ attention using alternative techniques, such as a story, sensory stimuli, thought-provoking questions, and variability in exercises, and using digital media.</td>
</tr>
<tr>
<td><strong>Relevance</strong></td>
<td>Students see relevance in the lesson, which, in turn, leads to increased learning. The lesson must be relevant not only to the learner, but also to previously taught lessons.</td>
</tr>
<tr>
<td><strong>Challenge/Confidence</strong></td>
<td>Students are challenged to achieve, and they gain confidence as they meet the challenge. Students need to feel that if they put in a good faith effort, they are capable of achieving the objectives. The challenge should properly match the students’ abilities.</td>
</tr>
<tr>
<td><strong>Satisfaction/Success</strong></td>
<td>Students gain success in achieving their objective, which promotes self-satisfaction from the learning experience. The most powerful reward is that the students find that the learning experience is relevant and useful to their own world or the one they aspire to live and work in.</td>
</tr>
</tbody>
</table>
An Example of How One School Uses Computers

- Ridgedale High School
  - All computers on a local area network
  - Three labs of 30 computers each
    - PCs and Macs
  - High-speed Internet connection in each classroom
An Example of How One School Uses Computers

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An Example of How One School Uses Computers

- Superintendent
  - Technology plan
  - Committee members can access the plan remotely
An Example of How One School Uses Computers

- Principal
  - Sending several text and e-mail messages to teachers and staff
  - Research on digital storytelling
An Example of How One School Uses Computers

- School secretary
  - Computerized telephone system
  - E-mail and voice mail
  - Teacher database
  - School inventory database
- Desktop publishing
An Example of How One School Uses Computers

- Technology coordinator
  - Installing and testing new software
  - Supporting systems
  - Problem solving
An Example of How One School Uses Computers

- Teachers
  - Community digital storytelling
  - Transmedia story
  - Research assignments
  - Wireless mobile lab
  - Network stores student data

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An Example of How One School Uses Computers

- Media specialist
  - Maintains online catalog
  - Creates classroom activities
  - Runs media center
  - Assists with research projects
An Example of How One School Uses Computers

- Students
  - Live broadcast of *Ridgedale News Show*
  - Talking, texting, and instant messaging about digital storytelling projects
An Example of How One School Uses Computers

- Parent
  - Web site links parents and school
  - Keep track of events
  - School information

Chapter 1: Integrating Educational Technology into the Curriculum
An Example of How One School Uses Computers

- Community
  - Links school and community
  - Students teach senior citizens how to use a computer
Chapter Summary

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Chapter 1 Complete

Integrating Educational Technology into the Curriculum