How Technology is Changing Surgical Technology Education

A look at the importance of technology in teaching and learning
Agenda

KEY TOPICS DISCUSSED IN THIS PRESENTATION

• Explain the different teaching methods and how to effectively utilize each method
• Comparison of traditional and modern teaching methodology
• The role of interactive technology in education
• The benefits of interactive technology
• New trends implemented in our program that have proven effective
NEW INSTRUCTOR
SPRING 2020 Jennings Louisiana
The diagram illustrates the percentages of information retained through different modes of learning:

- **Passive Learning Process**
  - Auditory: 5% (Lecture)
  - Visual: 10% (Reading)
  - Kinesthetic: 20% (Audio-visual)
  - Virtual reality: 30% (Demonstration)
  - Average Retention Rates: 50% (Discussion)
  - Teaching: 75% (Practice doing)
  - Learning: 90% (Teach others)

- **Active Learning Process**

This diagram highlights the importance of active participation in learning compared to passive methods.
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<th>Learning Domains</th>
<th>Teaching Methods</th>
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<td>Cognitive</td>
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<td>Affective</td>
<td>Group Discussion</td>
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<td>Self-Instruction</td>
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Traditional Teaching and Learning

- Physical learning materials and equipment like paper, pens and chalkboard
- Limited access to education materials and information
- Teaching and learning typically occurs in an in-person classroom setting

Teaching and Learning with Technology

- Wider access to education materials and information
- More available channels and tools for communication as well as collaboration
- Enables a more personalized kind of learning for students
# Traditional Teaching Method

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<td><strong>Lecture</strong></td>
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<td><strong>Self-Instruction</strong></td>
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- **Write down what I say.**
  - Write every word with little time to think about what you are writing.
  - Complete recall for exam method.
- **Do what I do.**
  - Video or instructor led demonstration of a particular skill with little reference on how it would be utilized later.
- **Repeat what I do.**
  - Practical testing on compartmentalized skills in any given unit that students were not fully able to comprehend.
- **Did you do your homework?**
  - Read your chapter. Outline the chapter. Complete the workbook assignments.
- **See one-do one- teach one.**
  - Clinical Preceptors would help students implement skills in the OR, during surgery on a real patient.
LECTURE

- Highly structured verbal transmission of information
- Good for foundational material
- Only minimal exchange between the instructor and the learner (passive learning)
- The lecture should not be someone reading the information that could be read independently

Demonstration and Return Demonstration

- Especially effective for psychomotor domain
- Actively engages learner
- Keep audience small.
- Extra space and equipment is expensive.
- Competency requires 1:1 teacher-to-learner ratio.

Self-Instruction

- Allows for self pacing
- Requires high level of motivation
  - May induce boredom.
  - Not good for students who procrastinate.

One-to-One Instruction

- Pace and content to meet individual needs
- Learner may feel isolated and overwhelmed.
- Inconsistent instruction

Scaffolding and Practice
<table>
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<tr>
<td>1</td>
<td>Foundational theories and knowledge presented in this way- but only to base future learning on.</td>
<td>Actively engages learner simultaneously visual, auditory, and tactile sensations. Repetition increases confidence</td>
<td>Instructor facilitates and guides peer driven discussion which allows for both subject and learner centered learning</td>
<td>Retention of information is promoted by stimulating the learner's enthusiasm and increasing the learner’s involvement</td>
<td>Higher level problem solving and interactive abilities. Provides a safe learning environment where the consequences are determined by variables</td>
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# Teaching Active Learning Strategies

- Team-based learning
- Cooperative learning
- Case studies
- Seminars

# Group Discussion

- Learners get together to exchange information.
- Can use with cognitive and affective material
- Average size of 10
- Instructor acts as facilitator.
- Instructor has to be able to tolerate less structure and organization.
- Group must have some knowledge of content.

# Gaming

- Fun with a purpose
- Excellent way to periodically review content
- Can create competitive environment that some may find threatening

# Simulation

- Can recreate learning situation numerous times and evaluate for effective simulation experiences following the INACSL standards
- Can be expensive and requires learning curve
Technology is an effective tool that can make education more meaningful and engaging for teachers and students alike.
PRINCIPLES FOR TEACHING ACROSS METHODOLOGIES

- Give positive reinforcement.
- Project an attitude of acceptance and sensitivity.
- Be organized and give direction.
- Elicit and give feedback.
- Use questions.
- Know the audience.
- Use the teach-back method.
- Use repetition and pacing.
- Summarize important points.
Increasing Effectiveness of Teaching

- Present information with enthusiasm.
- Include humor.
- Take risks.
- Choose problem-solving activities.
- Serve as a role model.
- Use anecdotes and examples.

**Use technology.**
The Impact of Technology on Teaching and Learning

Technology is a powerful tool that has changed how teachers teach and how students learn. It has provided people with access to education and access to different ways of communicating and working together.

Web 2.0 theory - the interactive, collaborative, cloud-based applications and tools that makes interactive teaching what it is today.
The Role of Interactive Technology in Learning

Interactive technology helps create opportunities for communication. It can encourage teachers and students to communicate more, share and discuss ideas, and collaborate with each other.
Benefits of Interactive Technology
Benefits to teachers

HOW TECHNOLOGY HELPS TEACHERS DO THEIR WORK

Allows teachers to be more flexible
Teachers can use different teaching methods and tools to suit their lessons or students.

Helps teachers connect more with students
Teachers are able to better communicate with their students and support them in their learning.

Allows access to more resources
Teachers are able to find additional and updated learning resources that can help them with their work.
Benefits to Students

HOW TECHNOLOGY HELPS STUDENTS LEARN

Allows for a more personalized learning experience
Students have more freedom to choose the methods and tools that help them learn best.

Improves students' communication skills
Students have access to different channels where they can communicate and collaborate with teachers and fellow students.

Helps students prepare for the future
Students become equipped to face a highly technological future and will be able to easily adapt.
Implementation - Technology in Action

Students love it!
Phone App Heads-up
Game to Review for Procedures
Comprehensive Final
Record sessions, make in session annotations, and perform immediate feedback and debriefing for the most effective learning.

Immersive simulation - allows faculty to evaluate from outside the room.
Virtual Reality

https://periopsim.com/
“SOWELA CONSTANTLY STRIVES TO IMPLEMENT THE LATEST TECHNOLOGY IN ORDER TO ENSURE OUR STUDENTS ARE WELL PREPARED WHEN THEY ENTER THE WORKFORCE. THIS NEW TRAINING SYSTEM WILL PROVIDE THE MEANS FOR THE SURGICAL TECHNOLOGY STUDENTS TO LEARN CRITICAL SKILLS THAT HELP THEM BECOME SUCCESSFUL EMPLOYEES IN THE GROWING HEALTHCARE INDUSTRY.”

-DR. NEIL ASPINWALL, CHANCELLOR, SOWELA TECHNICAL COMMUNITY COLLEGE
What technology is on the horizon
“We need technology in every classroom and in every student and teacher’s hand, because it is the pen and paper of our time, and it is the lens through which we experience much of our world.”

DAVID WARLICK
Wearable Technology

“Cut Suit realistic way to simulate the look, feel and smell effects of severe traumatic events on a live human, allowing first responders and physicians to safely perform real Hyper-Realistic® Open Surgery Simulator.

small, lightweight wearable computer with a transparent display for hands-free work. Can collaborate in real time. Access training videos, images annotated with instructions, or quality assurance checklists that help you get the job done, safely, quickly and to a higher standard.
Thank you to SOWELA Surgical Technology Class 4 for allowing us to trial these technologies, record their journey, and photography their program for this presentation.
Do you have any questions?

Send it to us! We hope you learned something new.