

Shaping the Medical Education

- **Technology Integration**
- **Continuous Professional Development & Life-long Learning**



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Technology Transforming Medical Education

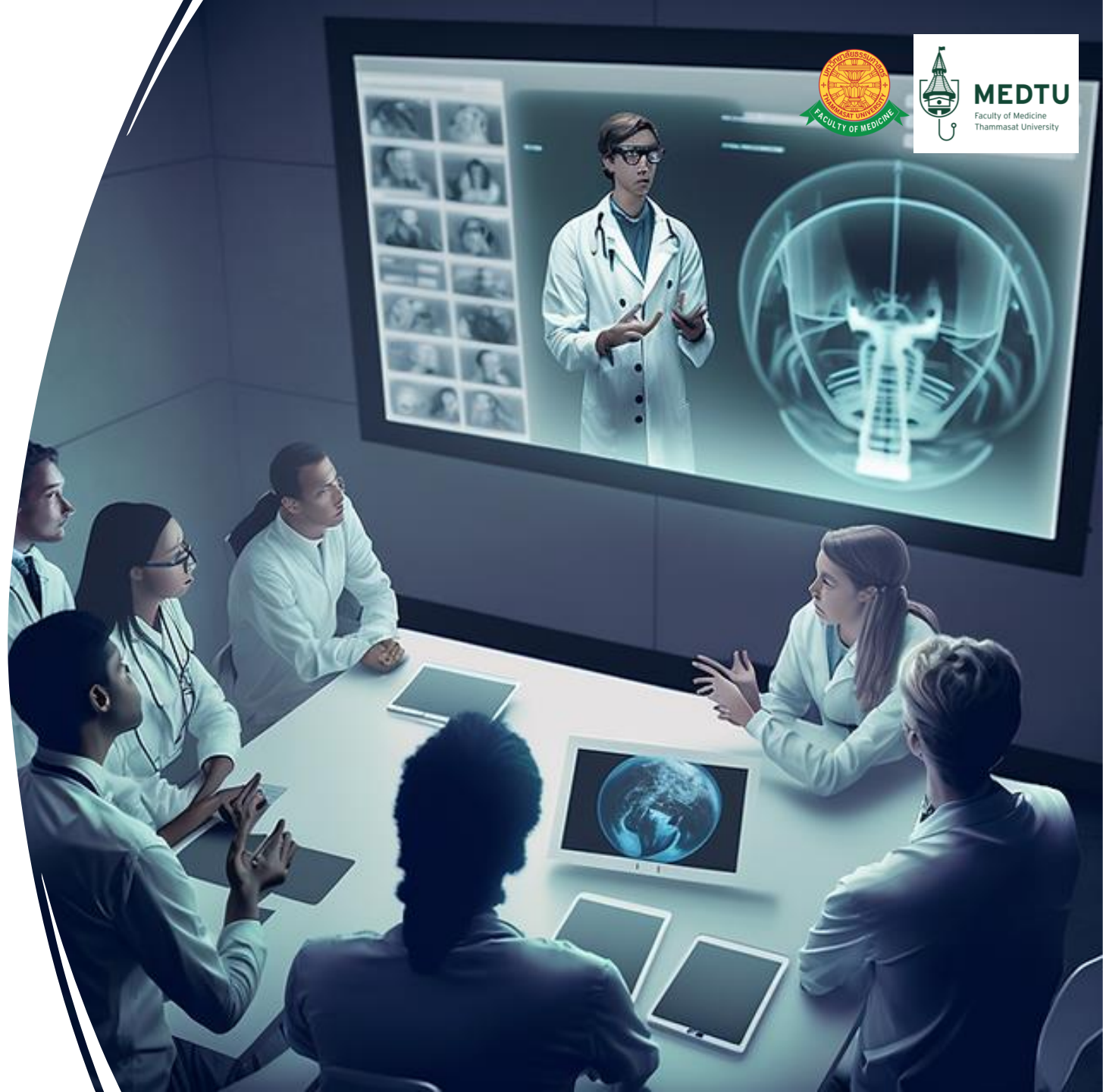


- **Technology is developing rapidly and affecting both health care and medical education.**
- **How do we cope with technology, how do we utilise it to become efficient, more productive, without losing the doctor patient relationship?**



Technology in Medical Education

- E-Learning Platforms
- Electronic Health Records
- Online Examinations
- Simulation Technology
- Augmented Reality
- Virtual Reality
- Artificial Intelligence



Thammasat Medical Skill and Education Center

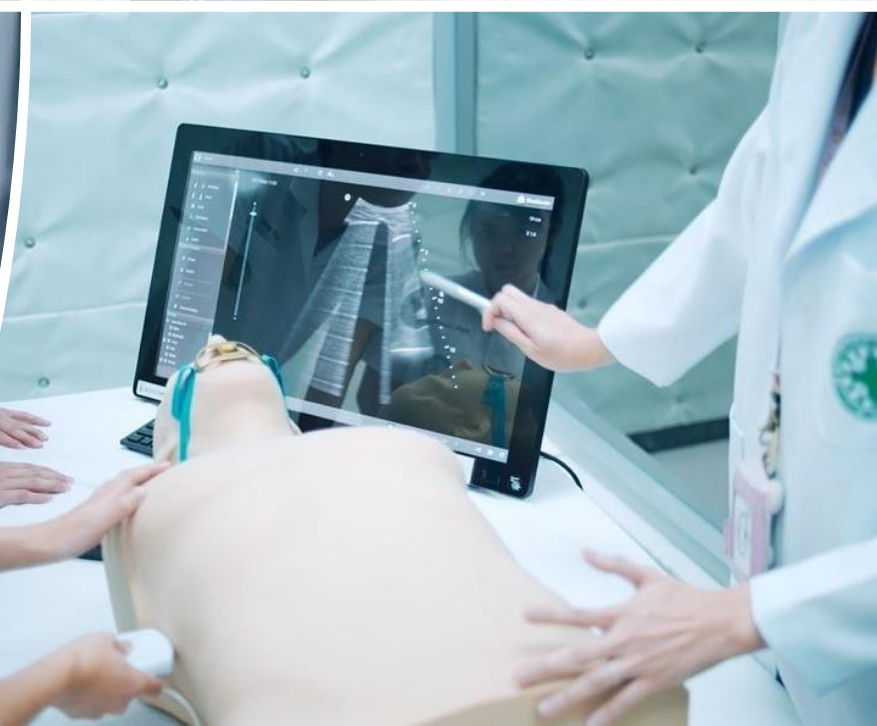


MEDTU
Faculty of Medicine
Thammasat University



Thammasat Medical Skill and Education Center

- Anatomy Laboratory Center
- Surgical Skill and Cadaveric Training Center
- Clinical skill center
- Simulation skill center



Thammasat Anatomy Laboratory Center

Computerized models which have started to combine with cadavers for learning anatomy, and **computerized images** have combined with microscopes in the classroom.





Thammasat Simulation skill center

- Simulated OR, IPD, OPD, ER,
- Basic Life Support room,
- Prehospital care/EMS

Simulator used in medical education

Computer-based



Manikin

**Part-task
trainer**

**High
fidelity
manikin**



**Standardized
patient (SP)**



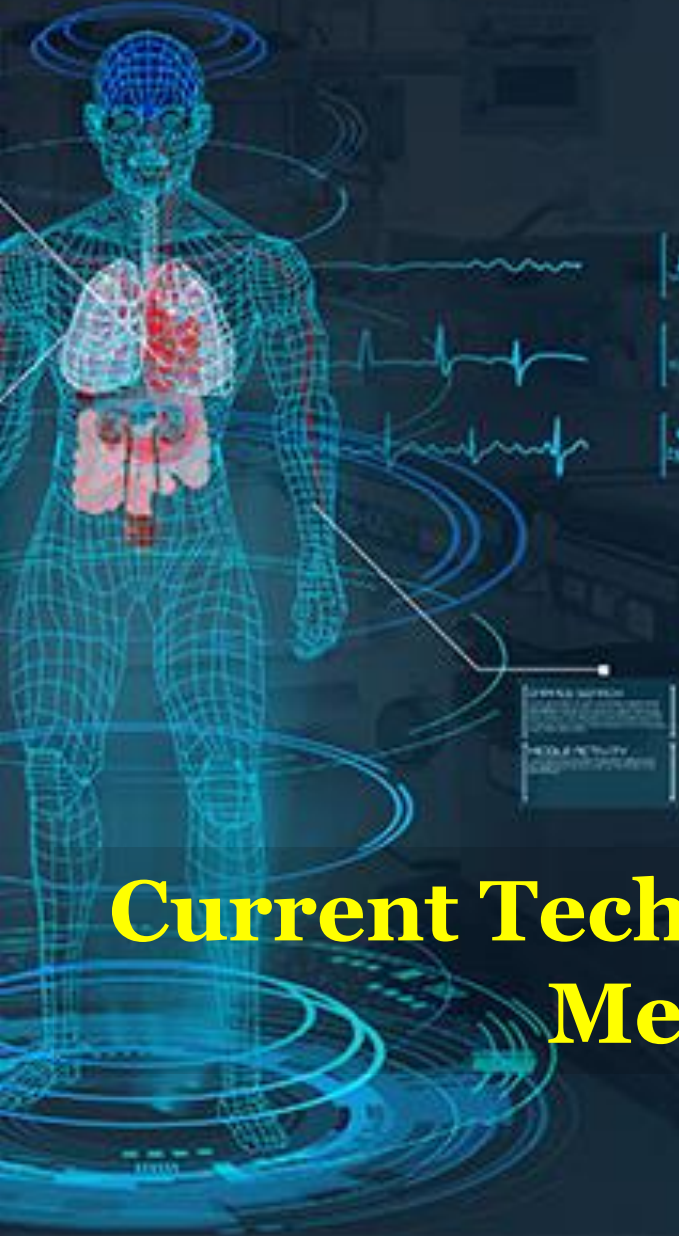
**Hybrid
(SP+ part-task trainer)**





ARTIFICIAL
INTELLIGENCE

Current Technological Trends Shaping Medical Education



IS AUGMENTED REALITY THE
FUTURE OF HEALTHCARE?

Interactive Simulator

Practice with Virtual Patients

Over 1000 virtual patient scenarios developed to enhance decision-making and critical thinking skills in a variety of environments





Real-time patient monitoring

Monitor the patient's vital signs. Pay attention because the values update in real time according to the patient's status



Complementary tests

Complete your diagnosis by ordering complementary tests. Choose from EKG, imaging, lab tests, and more



Interventions

Choose which actions to perform, administer oxygen, perform life support, and more

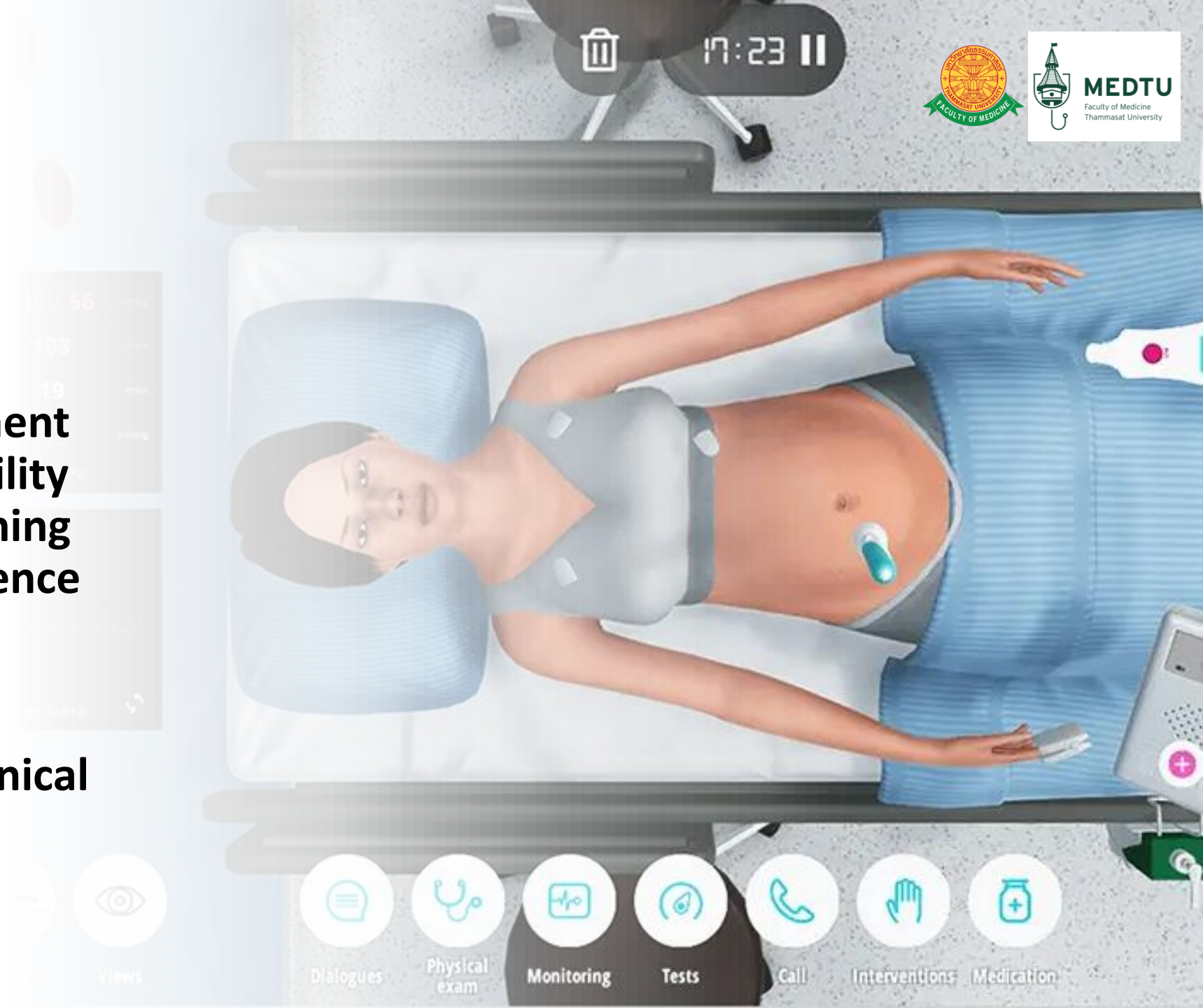


Medications & Prescriptions

Administer or prescribe medications and observe how they affect the patient's condition. Select the category, drug, route of administration and dose

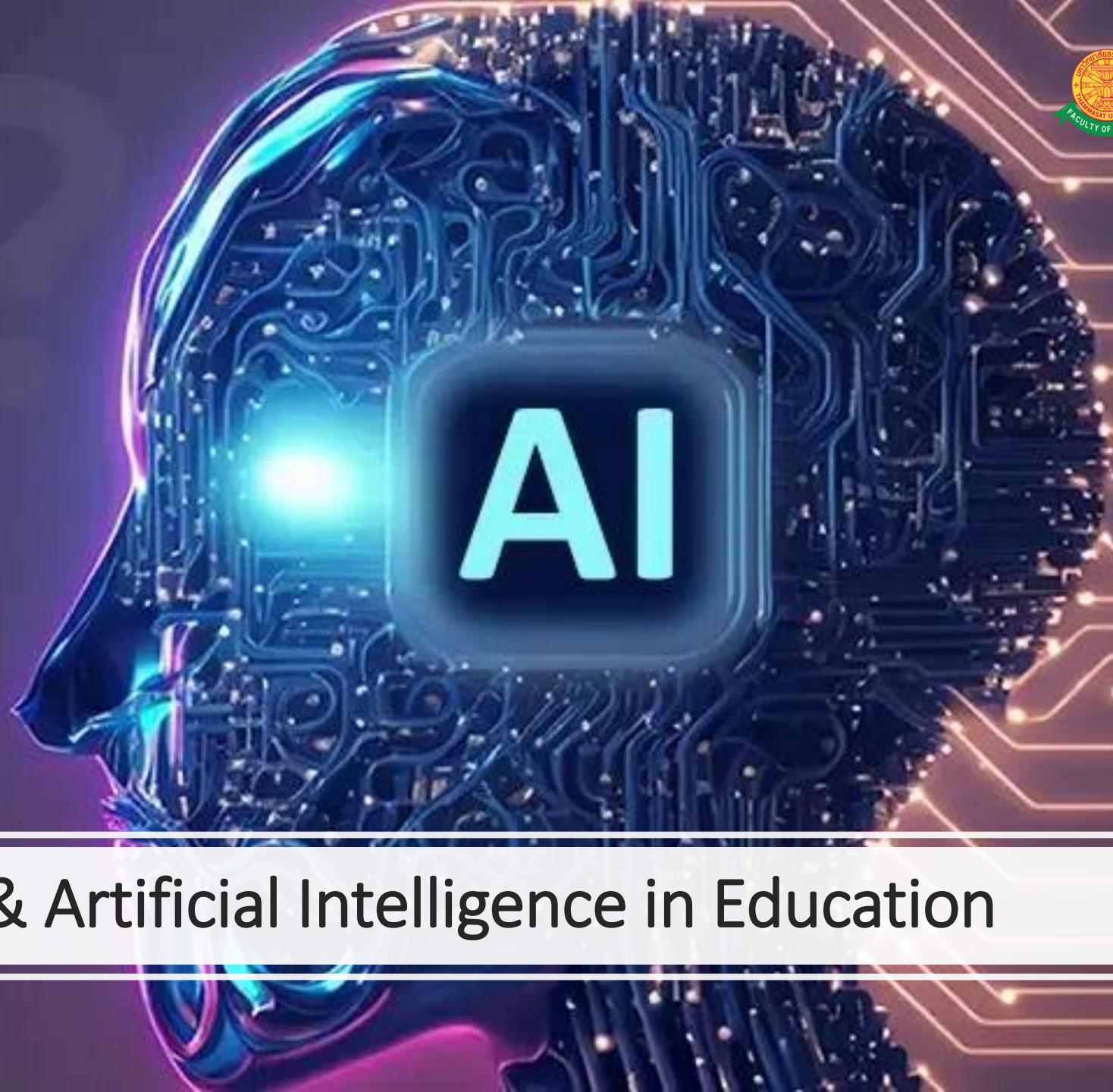
Practice with Virtual Patient simulation

- Safe Learning Environment
- Flexibility and Accessibility
- Standardization of Training
- Integration of Basic Science and Clinical Practice
- Interaction and participation
- Preparation for Real Clinical Practice



Challenges with virtual patient simulation

- Lack of Physical Examination **Skills**
- Absence of **Real-Time Feedback**
- Medical problems and their treatments vary from country to country. It is important for **each country to create clinical scenarios that meet specific local needs.**
- **High cost of implementation**

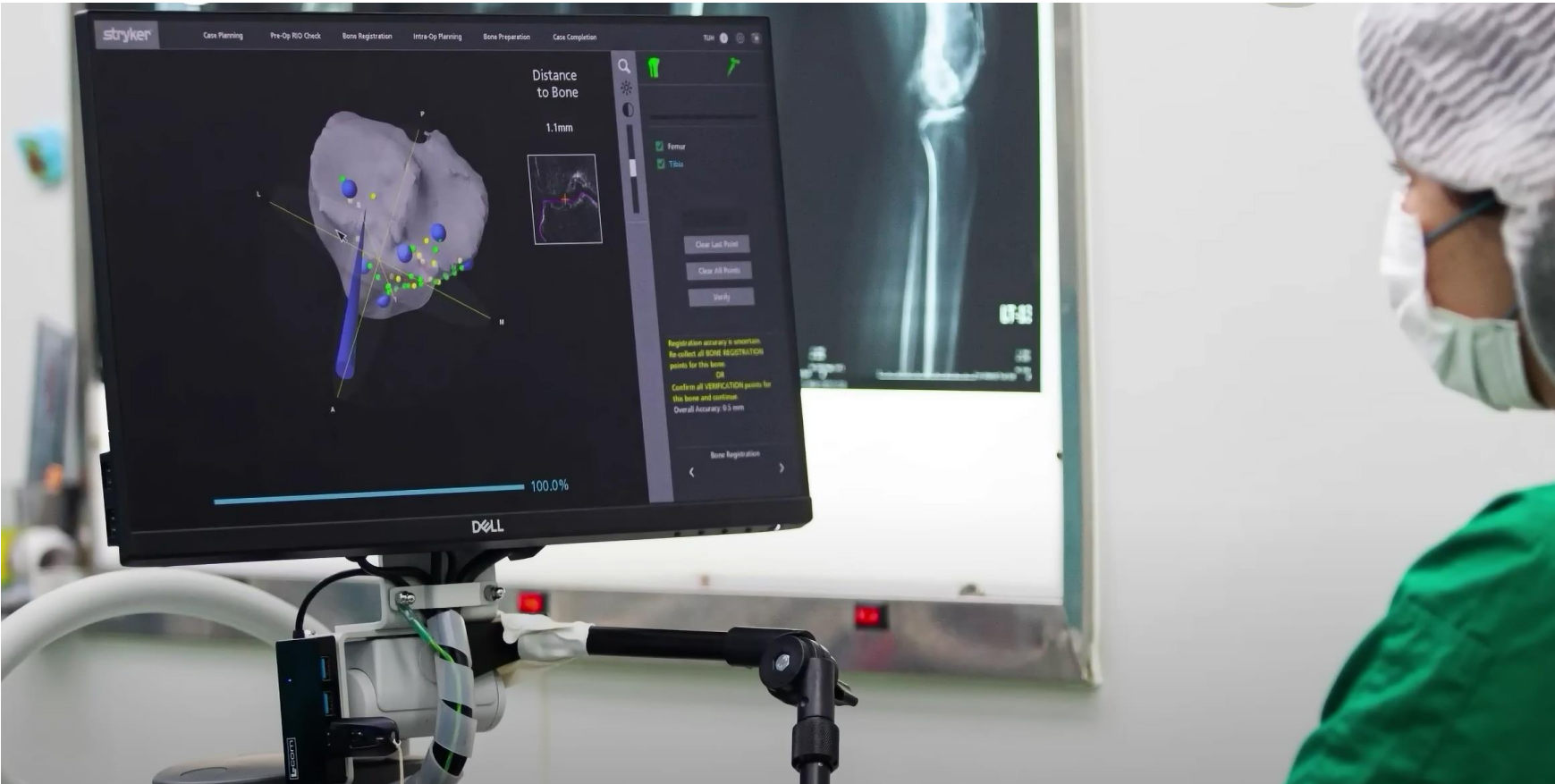


Digital & Artificial Intelligence in Education



Robotic joint surgery/replacement at Thammasat Joint Replacement Center

- Smaller incisions
- faster recovery times
- better results, 1% error with robot vs 5% error with human



เนื่องในโอกาสวันสถาปนา
มหาวิทยาลัยธรรมศาสตร์ครบรอบ **87 ปี**
โรงพยาบาลธรรมศาสตร์เฉลิมพระเกียรติ
ร่วมกับ สำนักงานหลักประกันสุขภาพแห่งชาติ
จัดโครงการจิตอาสา

**ผ่าตัดเปลี่ยน
ข้อเข่า ข้อสะโพกเทียม 200 ข้อ**

ผ่าตัดเปลี่ยนข้อเทียม : ข้อเข่า ข้อสะโพก นอกเวลาราชการ
เพื่อเพิ่มการเข้าถึงการผ่าตัดเปลี่ยนข้อเทียมของผู้ป่วยที่มีรายได้น้อย **โดยไม่เสียค่าใช้จ่าย**

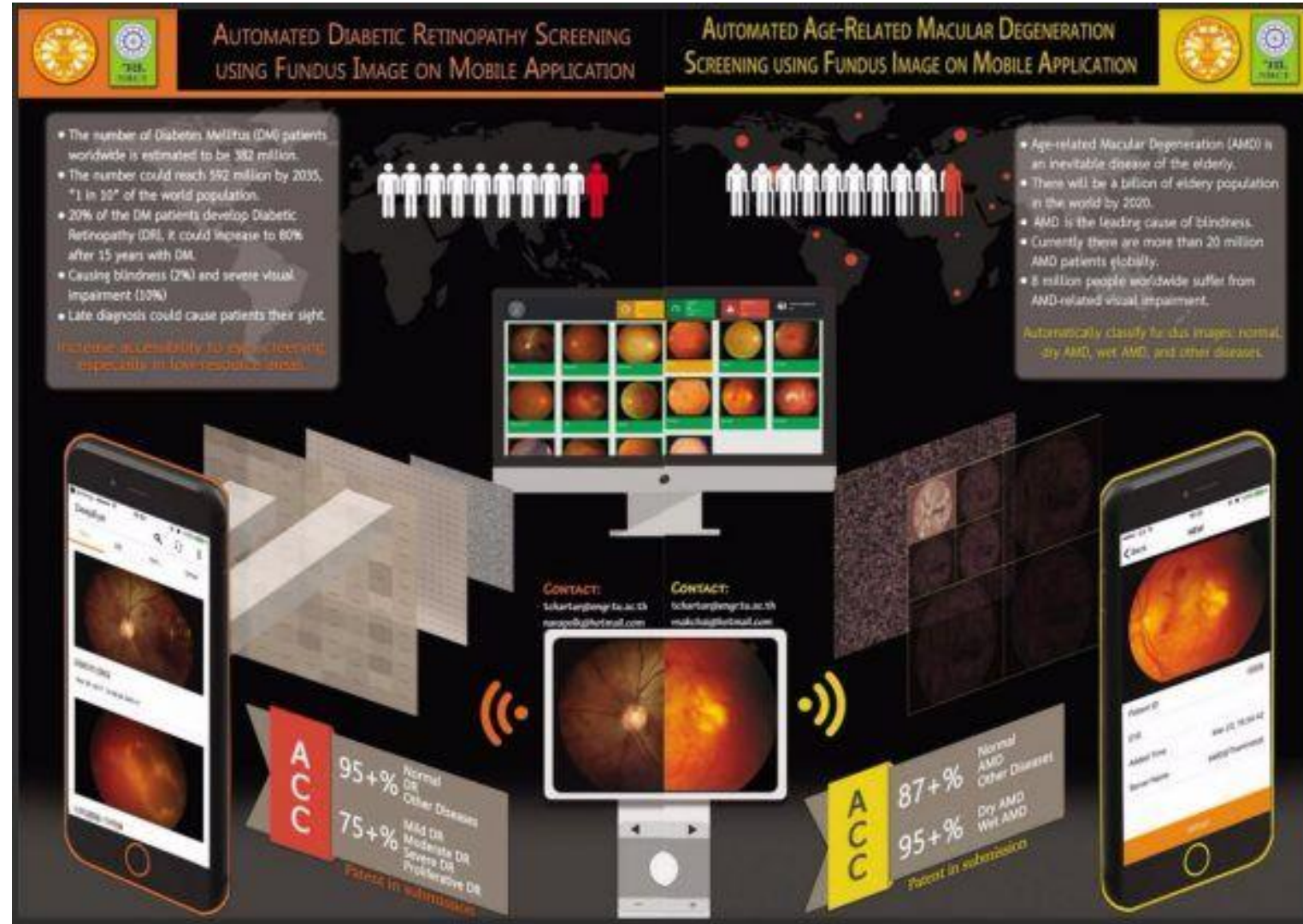
รับสมัครตั้งแต่ วันที่ 1 ธันวาคม 2564 - 31 มีนาคม 2565
หรือมากกว่าครบจำนวน

DeepEye Application

World's first Application
age-related macular degeneration



In collaboration
Department of ophthalmology
faculty of engineering
Thammasat University

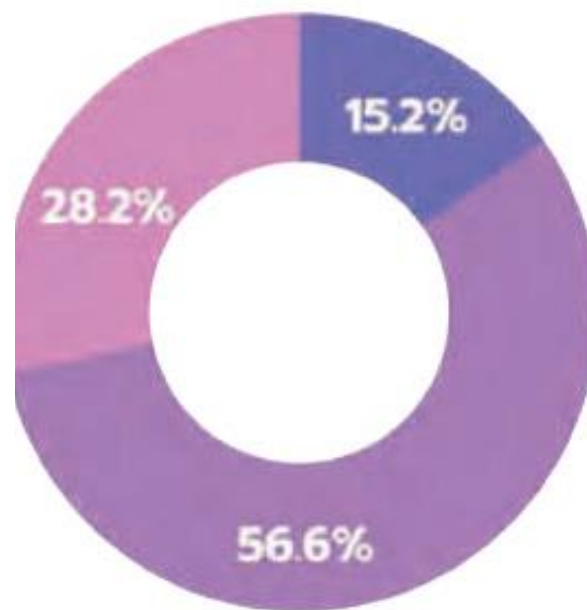


Using AI to detect and learn the abnormality of macular
Patient with macular diseases

Increasing of AI use in many of Thailand organizations

71.8 %

AI used and under
consideration in
Government segments
& organisations



15.2%
Already Adoption
ใช้แล้ว 86 หน่วยงาน



56.6%
Under Consideration
มีแผนที่จะใช้ 320 หน่วยงาน



28.2%
No Need Now
ยังไม่มีความต้องการ
และต้องการการสนับสนุนเพิ่มเติม
159 หน่วยงาน



Thailand National AI Strategy and Action Plan (2022 – 2027)



Thailand National AI Strategy and Action Plan (2022 – 2027)

Vision

“Thailand has an effective ecosystem to promote AI development and application to enhance the economy and quality of life within 2027”

3

Target objectives

Human capacity and Technology

- ▶ AI Reskill/ Upskill/ New skill for academic sector
- ▶ AI skill is used to enhance all work sectors
- ▶ New professional based on AI and digital skill

Economic growth

- ▶ Increase productivity with high value-added products and services using AI
- ▶ AI as a driver for Thailand national agenda
- ▶ AI innovation for Tech startups / SME / Digital Business

Social and environmental impact

- ▶ Enhance public access to government services using AI
- ▶ Bridging income, education, and healthcare gaps
- ▶ Better environment and efficient use of natural resources
- ▶ Enhance national security and safety

5

Strategies



Strategy 1

Preparing Thailand's readiness in social, ethics, law, and regulation for AI application



Strategy 2

Developing national infrastructure for sustainable AI development



Strategy 3

Increasing human capability and improving AI education



Strategy 4

Driving AI technology and innovation development



Strategy 5

Promoting the use of AI in public and private sectors

10

Target sectors

Food & agriculture

Healthcare & medical

Education

Security & safety

Energy & environment

Government service

Logistics & transportation

Creative economy & tourism

Manufacturing

Trade & finance

Focus on phase 1 (2022 - 2023)

Additional focus on phase 2 (2024 – 2027)

10 Target Sectors



Strategy 3

Increase human resource potential and develop education in artificial intelligence



Human resource in AI

- 01 – AI Profession
- 02 – AI Engineer
- 03 – AI Beginner



Related organization and operation

- 01 Increasing human resource in AI using AI sandbox by university
- 02 Increasing human resource in AI by university
- 03 Increasing human resource in AI for general population
- 04 Increasing human resource in AI for government sectors
- 05 Setting up national credit bank

Related organization

Ministry



Government sectors



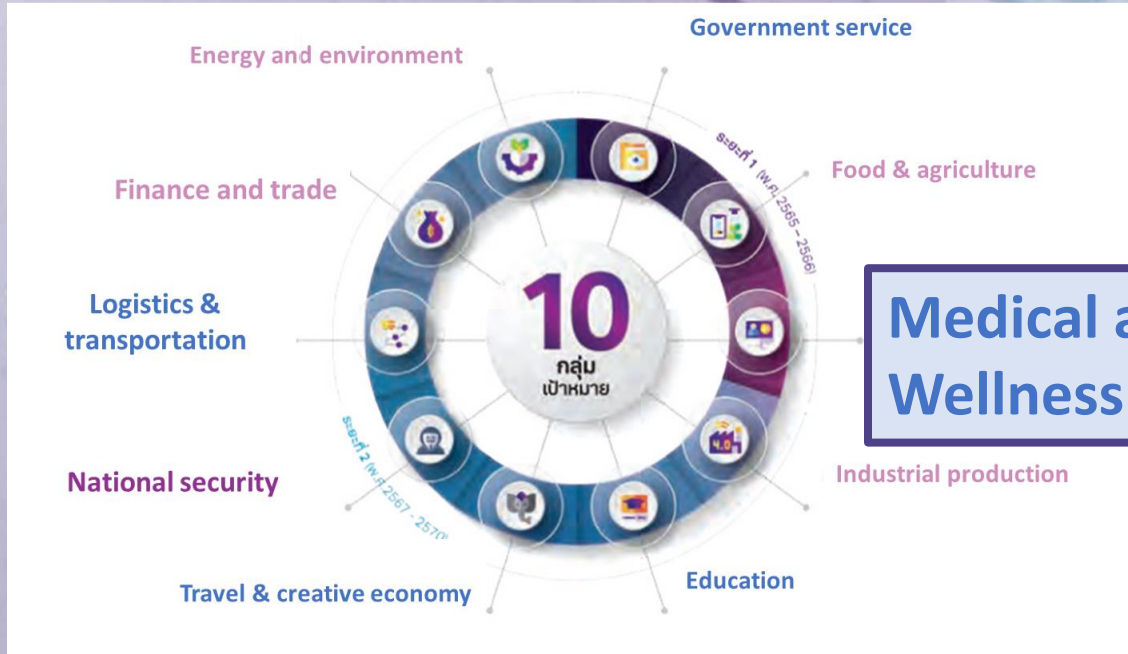
Educational sectors



Societies/organizations



Strategy



Strategy 3

Increasing human resource potential and developing education in artificial intelligence



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strategy to develop personnel with knowledge and skills in medical AI to support Thai society in the future

Collaboration to provide doctors with great knowledge in AI and digital health, deliver research, digital technology to serve the needs of Thailand



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UAB MEDICINE®

The University of Alabama at Birmingham

Collaboration



Masters of Healthcare Innovation

**Research
Healthcare personnel**

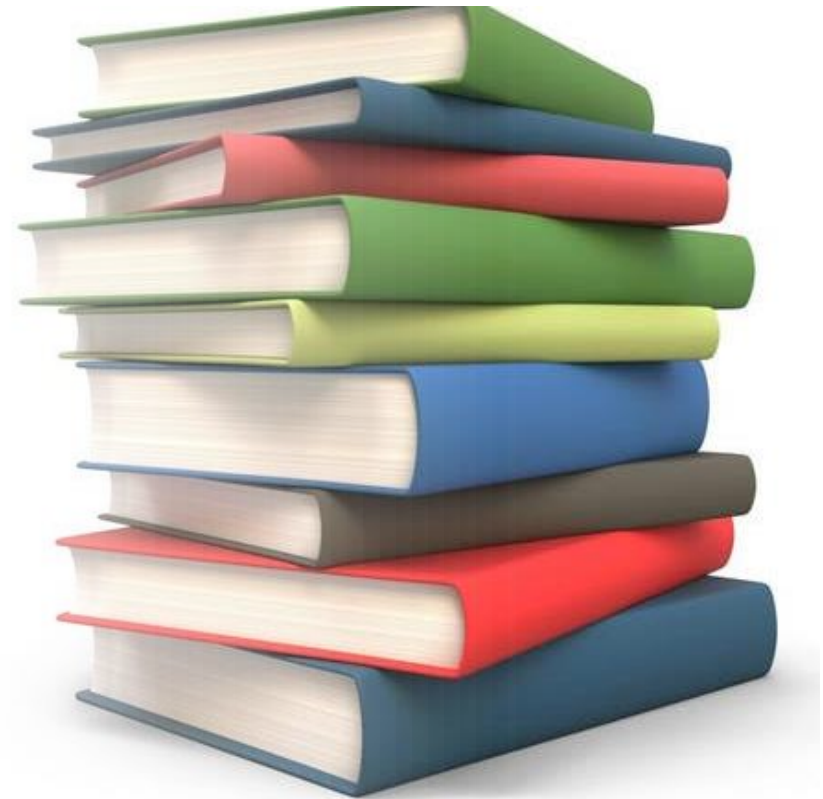
สวทช
NSTDA



KMUTNB

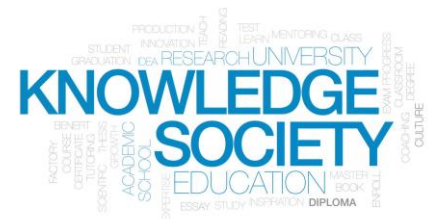
Shaping the Medical Education

**Continuous Professional
Development
&
Life-long Learning**



21st Century Learner

- Continuous learning becomes crucial in the 21st century, marked by the transition into the "Knowledge Society."
- Traditional skills like memorization are no longer enough.
- Students need lifelong learning skills, including the ability to learn how to learn, as new skills may emerge after graduating from medical school.



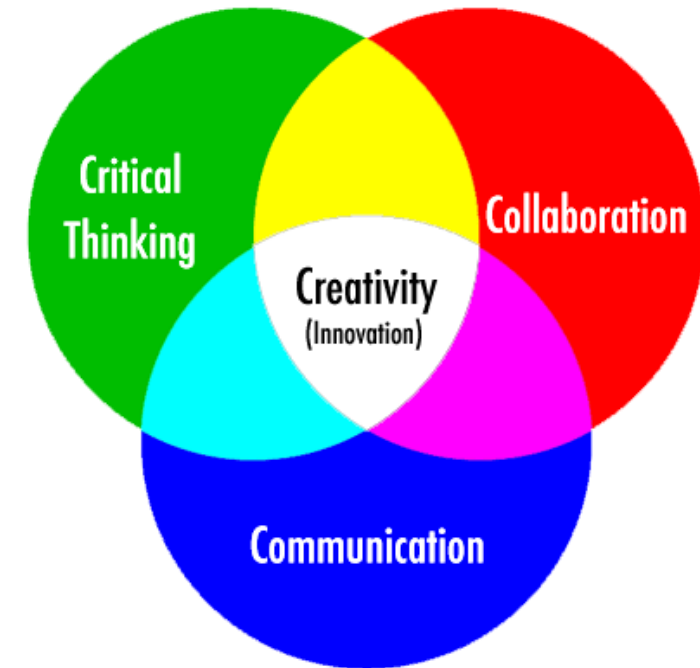
Comparison of 20th Century vs 21st Century approaches to Teaching and Learning

20th Century	21st Century
Time-Based	Outcome-Based
Time-Slotted	On-Demand
Passive Learning	Active Learning
Textbook-focus	Research Driven
Text-Based	Web-Based
Competitive Atmosphere	Collaborative Atmosphere
Fragmented curriculum	Integrated and Interdisciplinary curriculum
Learners work in isolation	Learners work collaboratively

The four C's of 21st Century skills



- The four C's of 21st-century skills are essential competencies for success in the modern world.
- These skills focus on critical thinking, collaboration, communication, and creativity.



21st Century Learner

Active learning



- Problem-based /Case based learning
- Team-based learning
- Research-based learning
- Flipped classroom



Problem-Based Learning

- Problem-based learning is student-centered.
- Focus on teaching → to a **focus on learning**
- Stimulate **collaboration** among students
- Develop **problem-solving skills** in professional practice
- Promote effective **reasoning and self-directed learning**
- Can increase **motivation for life-long learning**

Thammasat PBL Experience

- The Faculty of Medicine, TU was the 9th medical school set up in Thailand and was established in 1990
- Implemented a PBL curriculum since 1992
- All staff has been obliged to participate in PBL and play different roles, such as facilitators, resource person, block committee and scenario writing.




Thammasat PBL Experience

- Students are divided into small groups (6-8 people per group) with a teacher as a facilitator.
- Lectures are mainly focused on – complex topics or summarizing what has been learned.
- All tutors must enroll in a PBL-training course before conducting the actual PBL group.
- Tutors should be trained regularly to refresh and to update their knowledge about PBL and the group-facilitation skill.



Success in learning depends on various aspects

- 
- The faculty should provide different information sources and involve many teachers for small groups.
 - Teachers require training to facilitate group learning, understanding the questions and objectives. This is essential to maintain consistency across different groups.
 - Ensuring that courses are well-organized, with content and timing suitable for students' levels
 - Learning success relies on learners taking responsibility, placing more emphasis on searching for information than on traditional lectures.

Problem-Based Learning

Role of the Student

More active,

- Engaged as a problem-solver
- Decision-maker
- Meaning-maker

Not a passive listener and note-taker

Role of Instructor

Instructor's role

- Instructor becomes **facilitator and coach** of student learning
- Acts at times as a **resource person**, rather than as knowledge-holder and disseminator

Role of Executive

Have a policy to support

- Using education strategies to **promote active learning**
- **Technology integration**
- **Good environment**

Team-based Learning (TBL)

- Nowadays, TBL is widely used in medical schools because it has positive effects on developing critical thinking and working as a team member.
- The learning process is designed to be student-centered approach, where team of learners are assigned to study the lesson before class.

Conclusion I



- **The integration of technology into medical education is not just a trend; it's a vital necessity.**
- **Students and doctors who use these new technologies in medical training gain a significant competitive advantage.**
- **AI will not replace doctors, but doctors who know how to use AI will replace those who don't .**

Conclusion II

- Knowledge alone is not enough for success.
- A commitment to lifelong learning and continuous professional development ensures that medical practitioners are well-prepared throughout their careers.
- Active learning, such as PBL, encourage life long learning
- Implementing PBL will require more than training educators but a cultural and administrative effort from medical schools.

Thank you



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