

Joint Board of Education Meeting
Thursday, October 23, 2025 6:00 PM

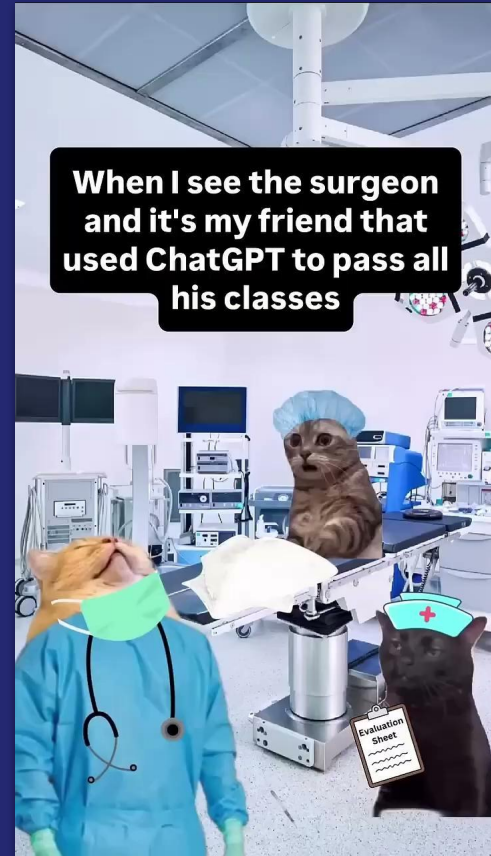
Harry Caray's
70 Yorktown Shopping Center
Lombard, IL 60148

Agenda

1. **Pledge of Allegiance**
2. **Board Roll Calls**
3. **Public Comment**
4. **Introduction of Program “AI in the Classroom: What the Research Says, Why It Matters, and How to Use it Wisely”**

AI in the Classroom

What the Research Says,
Why It Matters, and How to
Use It Wisely



Agenda

- Why is this conversation matters
- How learning works - a primer
- How AI impacts learning
- Uses of AI in the classroom
- Social Emotional Considerations
- What if we don't act quickly?

TECH

OpenAI to launch ChatGPT for teens with parental controls as company faces scrutiny over safety

PUBLISHED TUE, SEP 16 2025•10:47 AM EDT

UPDATED TUE, SEP 16 2025•11:42 AM EDT



Why This Conversation Matters

AI use is growing rapidly, including in schools

AI is very good at procedural tasks and many, especially in the tech sector are bullish on AI's potential impact in education. But students aren't laundry machines...



Microsoft Research - Occupational Implications of Generative AI

Table 3: Top 40 occupations with highest AI applicability score.

Job Title (Abbrv.)	Coverage	Cmpltn.	Scope	Score	Employment
Interpreters and Translators	0.98	0.88	0.57	0.49	51,560
Historians	0.91	0.85	0.56	0.48	3,040
Passenger Attendants	0.80	0.88	0.62	0.47	20,190
Sales Representatives of Services	0.84	0.90	0.57	0.46	1,142,020
Writers and Authors	0.85	0.84	0.60	0.45	49,450
Customer Service Representatives	0.72	0.90	0.59	0.44	2,858,710
CNC Tool Programmers	0.90	0.87	0.53	0.44	28,030
Telephone Operators	0.80	0.86	0.57	0.42	4,600
Ticket Agents and Travel Clerks	0.71	0.90	0.56	0.41	119,270
Broadcast Announcers and Radio DJs	0.74	0.84	0.60	0.41	25,070

Tomlinson, K., Jaffe, S., Wang, W., Counts, S., & Suri, S. (July, 2025). Working with AI: Measuring the Occupational Implications of Generative AI. *arXiv preprint arXiv:2507.07935*.



Table 4: Bottom 40 occupations with lowest AI applicability score.

Job Title (Abbrv.)	Coverage	Cmpltn.	Scope	Score	Empl.
Phlebotomists	0.06	0.95	0.29	0.03	137,080
Nursing Assistants	0.07	0.85	0.34	0.03	1,351,760
Hazardous Materials Removal Workers	0.04	0.95	0.35	0.03	49,960
Helpers–Painters, Plasterers, ...	0.04	0.96	0.38	0.03	7,700
Embalmers	0.07	0.55	0.22	0.03	3,380
Plant and System Operators, All Other	0.05	0.93	0.38	0.03	15,370
Oral and Maxillofacial Surgeons	0.05	0.89	0.34	0.03	4,160
Automotive Glass Installers and Repairers	0.04	0.93	0.34	0.03	16,890
Ship Engineers	0.05	0.92	0.39	0.03	8,860
Tire Repairers and Changers	0.04	0.95	0.35	0.02	101,520



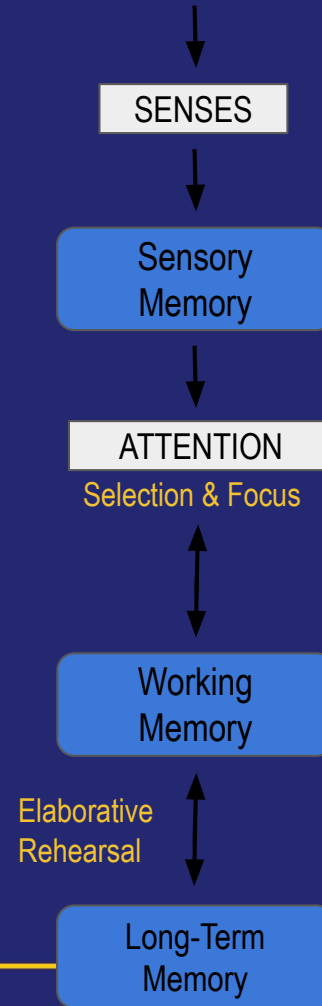
How Learning Works:

Working memory is limited (4–7 chunks)

Long-term memory is durable and effectively unlimited, but requires effort

Schema = organized mental models built through practice

Learning requires moving knowledge from working → long-term memory

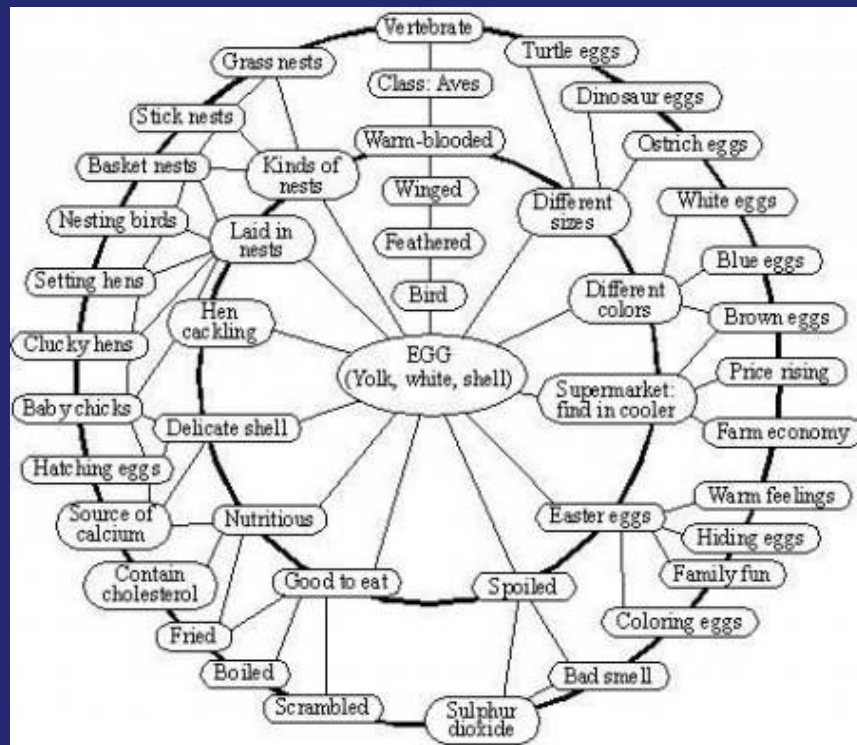


Harvard, B. (2025). *Do I Have Your Attention? Understanding Memory Constraints and Maximizing Learning* (1st ed.). Routledge.



Schema

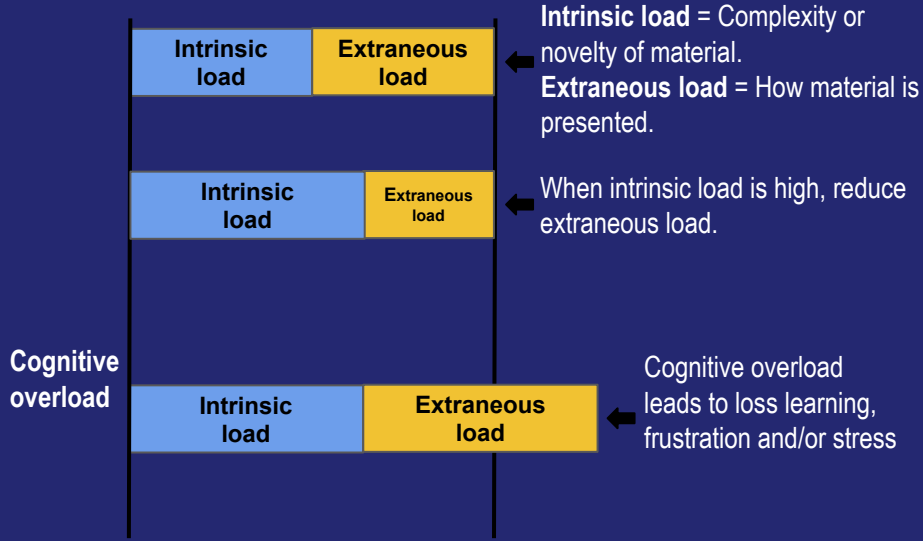
EGG



Schema



COGNITIVE LOAD CAPACITY



What is Cognitive Offloading?

“Cognitive offloading refers to the externalisation of cognitive process, often involving tools or external agents, such as notes, calculators, or digital tools like AI, to reduce cognitive load.”

(Gerlich, 2025, p.3)



What Happens When We Offload Too Much?

We skip steps that are essential for understanding

We fail to encode concepts deeply; we cannot think critically

We develop dependency instead of mastery

We use shortcuts that steals the learning process



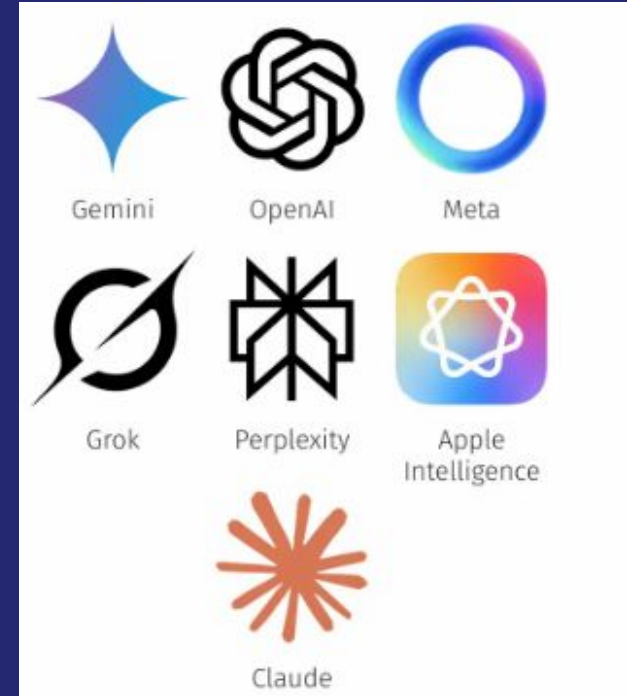
Research Synthesis – What We Know So Far

AI helps speed and fluency

Can lead to surface-level learning

Students may appear proficient, lack deep understanding

Teacher guidance is key to productive use



Study Spotlight: AI Tools in Society (Gerlich, 2025)

Purpose: Examine how AI tool usage relates to **cognitive offloading** and **critical thinking ability**.

Research Design:

- **Mixed-method** study combining surveys and performance-based critical thinking tasks
- **~700 participants** across multiple age ranges and education levels

Key Variables:

- **AI usage frequency** (self-reported)
- **Cognitive offloading tendency** (propensity to delegate thinking tasks to AI)
- **Critical thinking performance** (assessed through standardized tasks)



Study Spotlight: AI Tools in Society (Gerlich, 2025)

“The findings revealed a significant negative correlation between frequent AI tool usage and critical thinking abilities, mediated by increased cognitive offloading. Younger participants exhibited higher dependence on AI tools and lower critical thinking scores compared to older participants. Furthermore, higher educational attainment was associated with better critical thinking skills, regardless of AI usage. These results highlight the potential cognitive costs of AI tool reliance, emphasising the need for educational strategies that promote critical engagement with AI technologies.”

Gerlich, M. (2025). AI Tools in Society: Impacts on Cognitive Offloading and the Future of Critical Thinking. *Societies*, 15(1), 6.



Study Overview: MIT Media Lab (2025)

Purpose: Examine how using ChatGPT affects task performance, reasoning ability, and brain activity.

Design: Controlled lab experiment with EEG monitoring.

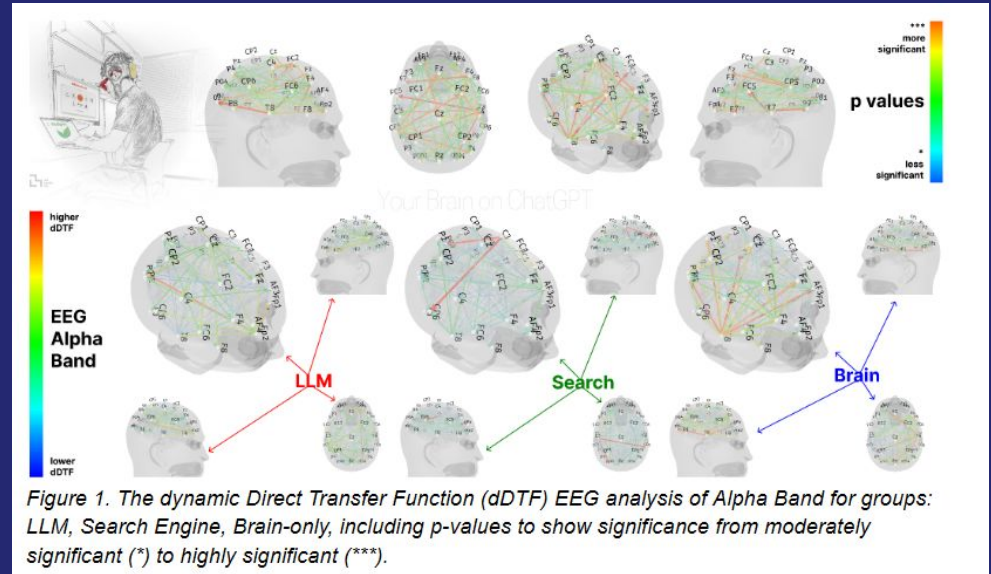
Participants: Undergraduate and graduate students from multiple disciplines.

Tasks:

Writing and problem-solving tasks with and without ChatGPT.
Transfer tasks requiring reasoning and originality.

Measures:

Accuracy and quality
EEG indicators of cognitive engagement and brain connectivity



Study Overview: MIT Media Lab (2025) - Findings

Initial Tasks: AI (LLM) group matched or slightly outperformed control groups in surface-level quality.

Transfer Tasks: AI group performed **significantly worse** when applying knowledge to new problems or altered conditions.

Memory & Recall: Figure 7 — AI group had **significantly fewer correct quotes** from their own essays compared to both control groups ($p < 0.001$).

Self-Recognition: Many AI users struggled to recognize or explain their own AI-assisted work when asked to walk through their process, suggesting weaker ownership of thinking.

Neural Engagement: EEG alpha band connectivity was lower in the AI group, indicating **reduced cross-region brain activation** during tasks, consistent with lower cognitive effort.

Interpretation: AI may promote efficiency but reduce deep cognitive processing required for critical thinking.

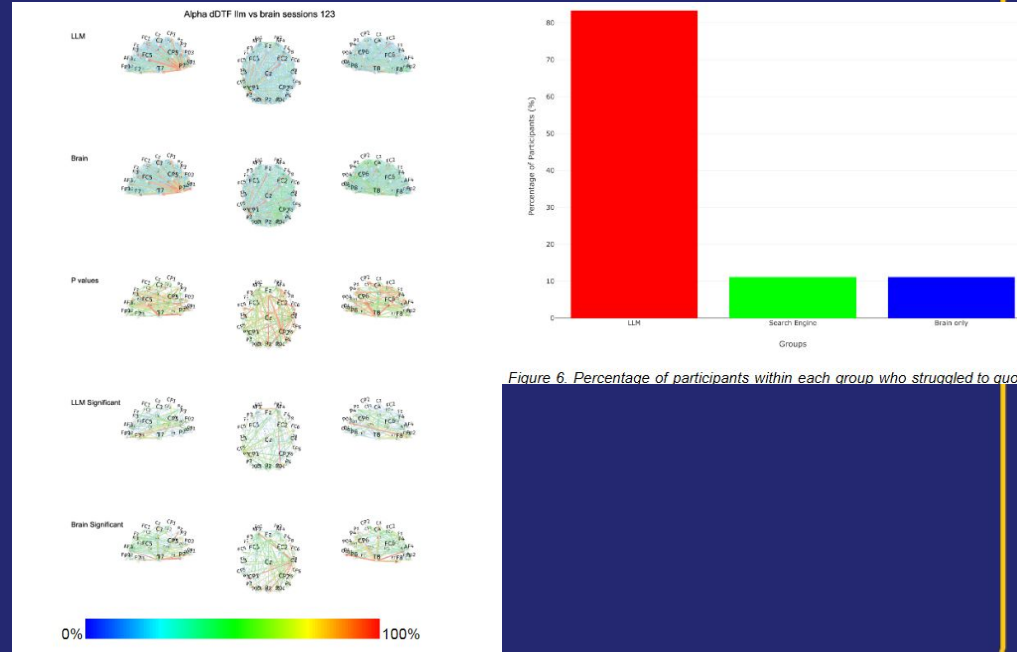


Figure 6. Percentage of participants within each group who struggled to quote

Wu, S., Moss, A. J., Coker, B., Glaser, N., Penney, L., Rolfe, J., & Grosz, B. J. (2025). *AI tools in education: Effects on task performance, learning, and cognitive processing*. arXiv.



Wait... Can't AI aide in learning????

Yes, when it supports thinking, and doesn't replace thinking.



When AI Helps Learning - Top 7 Research-based Strategies

1. Clarifying Confusing Instructions or Content

Why it works: Students can get explanations in simpler language, adjusted to their reading level or language background.

Example: An English learner asks AI to restate lab instructions in plain English.

Benefit: Reduces *extraneous cognitive load* so working memory can focus on the actual task.

2. Generating Additional Practice Problems

Why it works: Students can request more examples targeted at their weak areas.

Example: A geometry student asks AI to make 5 practice proofs with increasing difficulty.

Benefit: Increases *germane load*—more opportunities to strengthen schema through varied practice.

3. Brainstorming and Idea Generation

Why it works: AI provides prompts or angles that help students overcome “blank page” paralysis.

Example: For a persuasive essay, a student asks AI for possible arguments on both sides of the topic.

Benefit: Reduces decision fatigue and frees mental energy for planning and execution.



When AI Helps Learning - Top 7 Cont.

4. Language Support for Multilingual Learners

Why it works: AI can translate, define, or rephrase while preserving meaning.

Example: A Spanish-speaking student uses AI to check whether their English essay sentences are grammatically correct.

Benefit: Supports access and equity without removing the need for student-generated thinking.

5. Providing Formative Feedback on Draft Work

Why it works: Students can get immediate, non-graded feedback before turning in assignments.

Example: A science student pastes their lab conclusion into AI to check for clarity and logical flow.

Benefit: Encourages self-revision and metacognition without replacing the student's own work.

6. Creating Study Aids

Why it works: AI can help students summarize notes, create flashcards, or generate concept maps.

Example: A history student inputs their lecture notes and asks AI to make 10 key study questions.

Benefit: Supports retrieval practice and review, reinforcing long-term retention.

7. Role-Playing and Simulation

Why it works: AI can act as a debate opponent, historical figure, or patient in a medical simulation.

Example: In a government class, AI plays the role of a senator with a particular policy stance for students to question.

Benefit: Builds application skills and adaptive thinking in a safe practice environment.



Social Emotional Concerns

ARTIFICIAL INTELLIGENCE

The family of teenager who died by suicide alleges OpenAI's ChatGPT is to blame

The parents of Adam Raine, who died by suicide in April, claim in a new lawsuit against OpenAI that the teenager used ChatGPT as his "suicide coach."

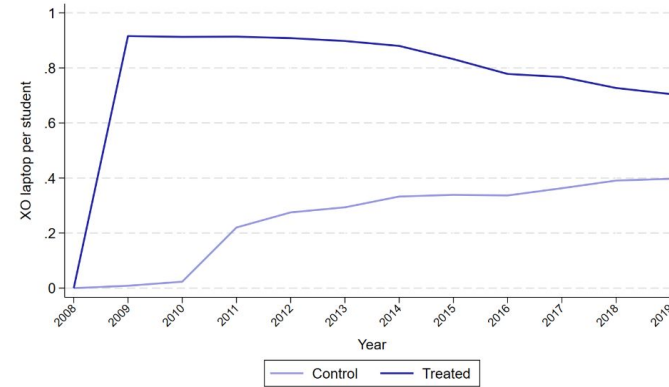
- Context - Over the past decade, in-person social engagement has dropped from 125 minutes a day to 42 minutes a day (Kannan & Veazie, 2022).
 - 40% of high school students report persistent feelings of sadness/hopelessness (CDC)
 - 44% of high school students report having no supportive relationships (peers or adults); a reduction by half a decade ago (Margolius, 2020)
- AI is reshaping how youth experience intimacy, identity, and support
 - AI Companion Bots are the fastest growing consumer market
 - Surveys show 45% of high school students use GenAI platforms to deal with friendships, relationships, and mental health issues (Brookings Institute, 2025)
- A recent study from OpenAI and MIT found that participants who used chatbots everyday for a 4 weeks reported less loneliness, but also socialized significantly (Fang et al, 2025)
 - Significant potential downsides as AI can praise and support unhealthy tendencies



What if we don't act quickly?

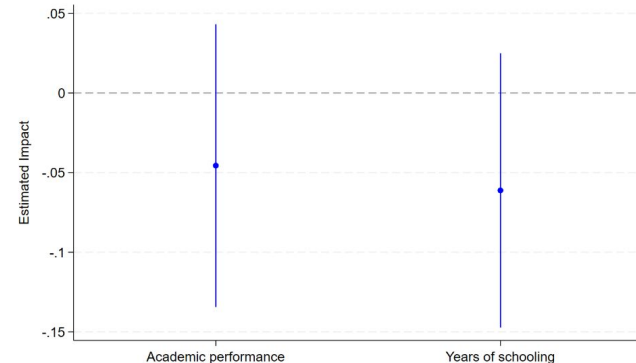
- One Laptop per Child (OLPC) - A study from Peru
- \$200 million on 800k laptops
- Measured effects on academic achievement and academic progression
- Data from 140 schools - “small effects on...outcomes beyond digital skills”
- Why? - “relatively limited adoption... for academic purposes”

Figure 1: XO Laptops per student over time



WORLD
ECONOMIC
FORUM

Figure 3: Effects on student educational trajectories



UNITED NATIONS



Do you agree with the content and perspective of this presentation?

Yes. The content and perspective align with current cognitive science and education research. The presentation correctly:

- Grounds AI use in **learning theory**—schema development, working memory limits, and cognitive load.
- Distinguishes between **AI as a support** (reducing extraneous load, enhancing practice, providing feedback) and **AI as a substitute** (leading to shallow processing and offloading).
- Recognizes **social-emotional implications**, which are often overlooked but critical for adolescent development.
- Emphasizes **teacher mediation** as the decisive factor in whether AI improves or weakens learning outcomes.

The cautionary stance—supporting thoughtful, structured integration rather than unrestricted adoption—is consistent with empirical findings from MIT, Gerlich, and others.

Verdict: The presentation is balanced, research-aligned, and pedagogically sound. It promotes responsible innovation rather than resistance or blind enthusiasm.



Questions?



Learning Material

↓
SENSES

↓
Sensory
Memory

↓
ATTENTION

Selection & Focus

↕
Working
Memory

↕
Elaborative
Rehearsal

↕
Long-Term
Memory

Choke Point: Mental effort or concentration is a limited resource.

Solution: Overlearning and practice to make knowledge automatic.

Choke Point: Narrow focus of attention limits learning.

Solution: Avoid distractions.

Choke Point: Working memory has a limited capacity of about 4 chunks of information.

Solution: Organize information into large chunks (chunking).

Choke Point: Forgetting occurs in working memory and long-term memory.

Solution: Distinctive, overlearned memories resist interference.

Pitfall: Multitasking and distractions greatly reduce learning.

Solution: Remove distractions in order to study with full focus.

Pitfall: Students often prefer the least effective study strategies for long-term learning.

Solution: Develop study strategies based on elaborative rehearsal and desirable difficulties.

Pitfall: People are often overconfident when judging their level of understanding (Metacognition).

Solution: Find ways to assess your understanding, use feedback to regulate your learning.



5. **Other Comments and Observations**
6. **Adjournment**