Generational Gaps in Clinical Education

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Learning Objectives

Identify	generational and personality factors that influence communication and learning styles.
Describe	key characteristics of generational cohorts represented in today's workforce.
Recognize	current generational trends in the labor force and the impact it has on communication, education, and clinical environments.
Define	adaptation and apply positive adaptation strategies to support effective collaboration, teaching, and learning across generations.

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Generational Birth Year Breakdown

Baby Boomers - "Post-War Generation" - 1946 – 1964[1(p2)] (62-80)

Gen X - "Latch Key Kids"[2(p12)] - 1965 - 1980[1(p2)] (46 – 61)

Gen Y - "Millennials" - 1981 – 1996[1(p2)] (30 – 45)

Gen Z - 1997 - 2012[1(p2)] (14 – 29)

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Quiz time!!!



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Through which medium did you listen to music as a teen?

A. Record Player / Radio
B. Cassette Tapes / Walkman
C. IPod / Burned CDs
D. Spotify

What artists were topping the charts at that time?

A. Elvis Presley, Bob Dylan, The Beatles, Jackson 5
B. Madonna, Willie Nelson, Eric Clapton, Queen, Michael Jackson, Prince
C. Mariah Carey, Adel, Back Street Boys, NSYNC, Ed Sheeran, Taylor Swift
D. Billie Eilish, Tate McRae, Lil Nas X, Khalid

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What was your generation's toy of choice?

A. Frisbee, Jacks
B. Rubix Cube, Magic 8 Ball
C. Cabbage Patch Dolls, Roller Blades, Transformers
D. Elmo, Tomagachi, XBox

Be honest, what was considered "slang" of your youth?

A. Be cool, Groovy, Way Out
B. Dude, Ace, Rad, As if, NOT
C. Bling, Funky, Doh, Wassup?
D. Emoji symbols, GOAT, Slay, LOL

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Which was a popular show of during your generation's youth?

A. *Captain Kangaroo, I Love Lucy, Gilligan's Island, Ed Sullivan Show*
B. *Sesame Street, 90210, Boy Meets World, Mr. Rodgers*
C. *Full House, Scrubs, Buffy the Vampire Slayer*
D. *Barney, Stranger Things, Wednesday*

Who were the iconic athletes you looked up to as a teen?

A. Jackie Robinson, Billie Jean King, Muhamad Ali, Arnold Palmer
B. Tony Hawk, Michael Jordan, Andre Agassi, Lance Armstrong, Steffi Graf
C. Magnificent Seven, Nancy Kerrigan, Serena Williams, Tiger Woods, Usain Bolt
D. LeBron James, Anthony Edwards, Christiano Ronaldo

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What historical event or phrase impacted your adolescent / early adulthood?

A. *"A chicken in every pot."* - ***President Herbert Hoover***
B. *"The president is dead."* - ***Walter Cronkite***
C. *"Mr. Gorbachev, tear down this wall."* **- President Ronald Reagan**
D. *"Terrorist attacks can shake the foundations of our biggest buildings, but they cannot touch the foundation of America."* **- *President George W. Bush***

Answered mainly with:

"As" = Baby Boomers | "Bs" = Gen X | "Cs" = Millennials | "Ds" = Gen Z

"Cusper" [2(p5)]*: Someone who overlaps generations*

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Communication: *Perceptions and Assumptions*[3]

"Out of Respect"

- *"I've really been struggling with my mental health lately, my stress level is too high and my anxiety is awful l right now. So out of respect for you and my classmates, I will not be coming to class tomorrow."*

Colleague and Gerhardt Responses:

Baby Boomer: "But...out of respect for others, you GO to work. You don't stay home!"

Gen Z: "That tracks. You wouldn't go to class or work if you were physically not feeling well, the same holds if mentally you aren't doing well. You don't want to bring that around other people and expose them to it."

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Generational Shapers[4]

- Socioeconomical Events - Status
- Political Sciences
- Auto/Technology Advancements
- Trends
- Vocabulary

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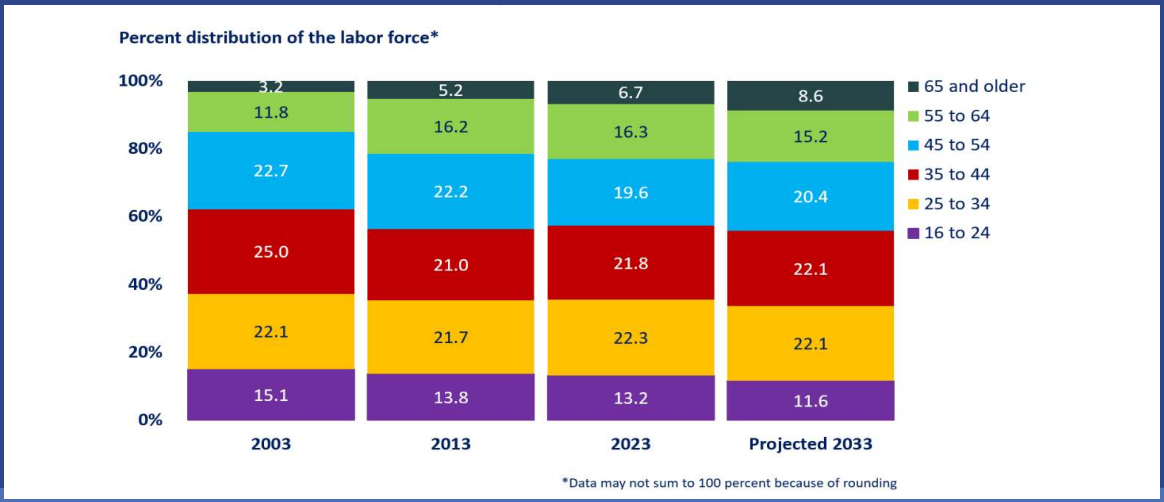
2033 Projected Labor Force by Generational Age



Source: Torpey E[5]

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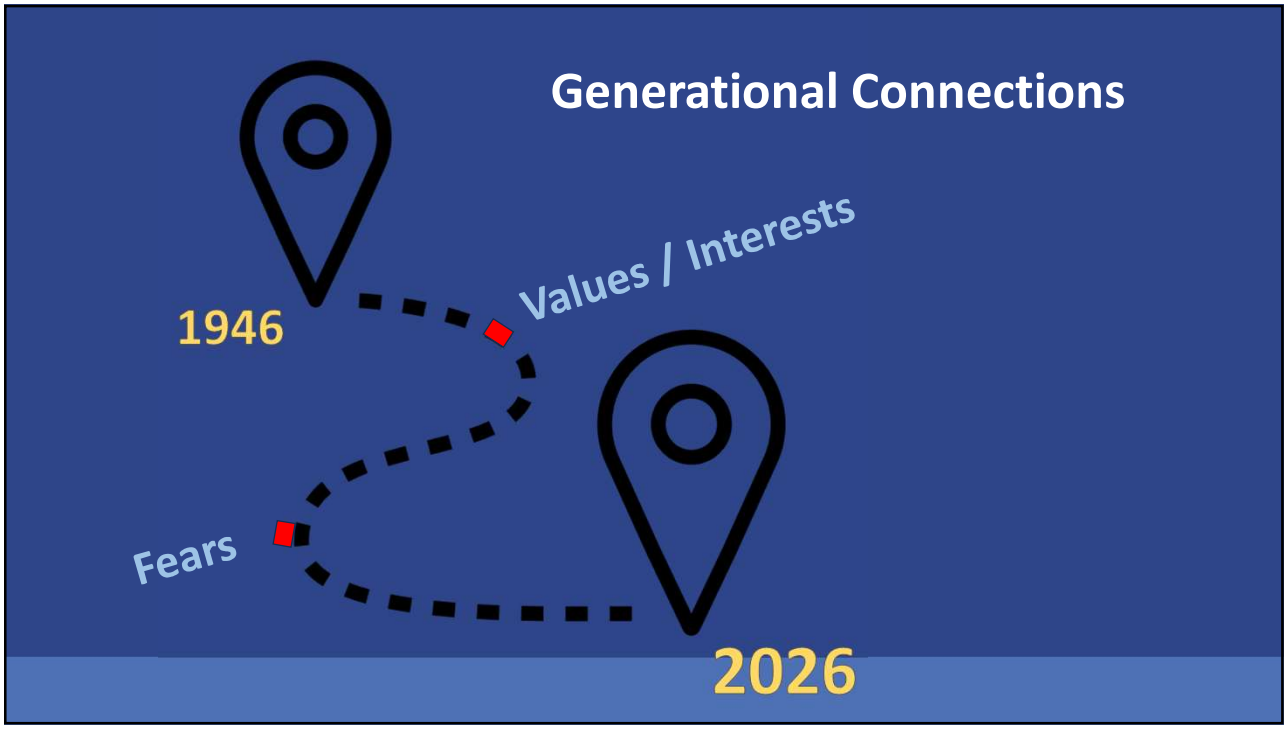

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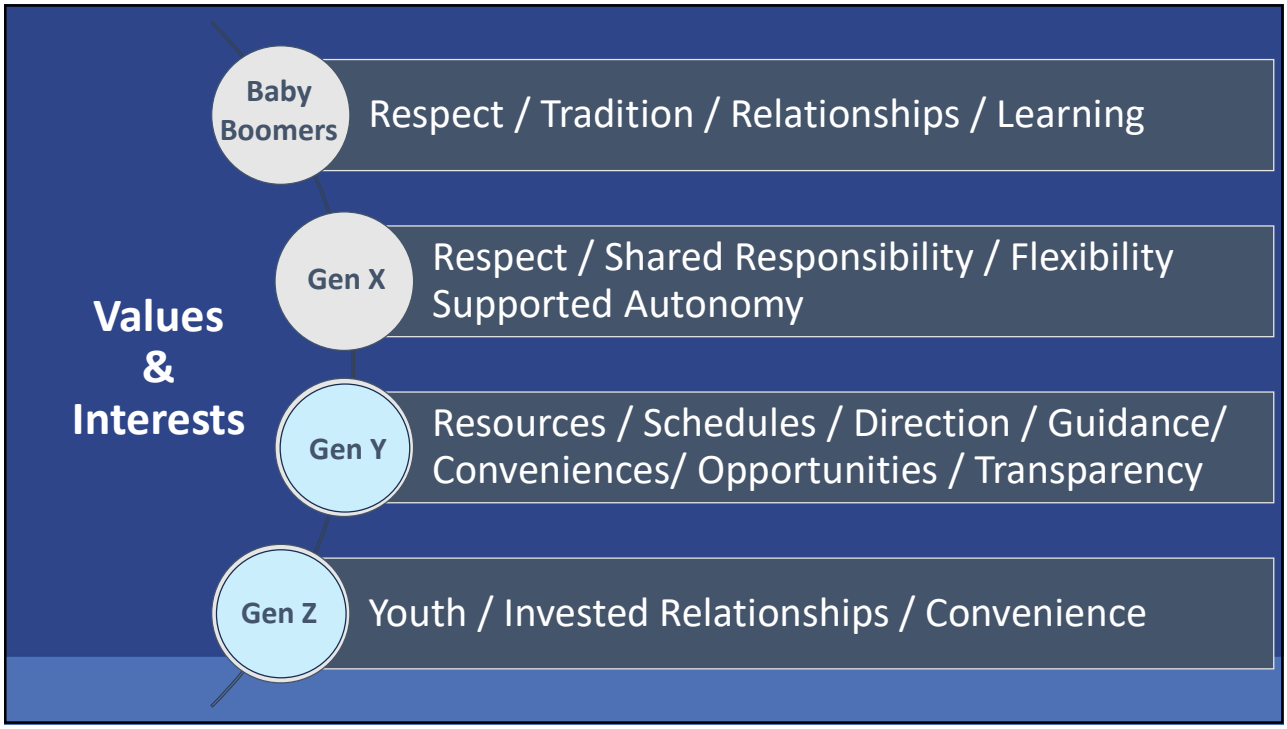

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Fears

- Loss of professional identity, relevance, traditions and history — Baby Boomers
- Loss of relationships, money & time; Lack of support and preparedness — Gen X
- Failure/disapproval, being misunderstood, or unprepared; Ambiguity and independence — Gen Y
- Loss of privacy and security; Ambiguity and conflict — Gen Z

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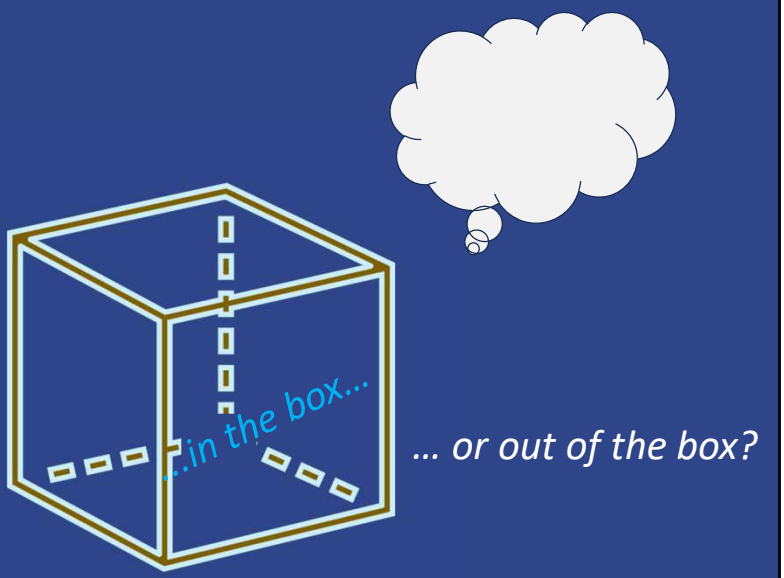
Boxed Thinking

Are you…



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"Boxed" Thinking Characteristics[6]

In the Box

- Quick to defend motives
- Blame and ruminate on past
- Objectify others:
  - Incompetent / Irresponsible
  - Insensitive / Disrespectful
  - Unappreciative
- Feel justified when others fail
- Exaggerating one's own successes
- Demotivating team

Out of the Box

- No need for self justification
- Emotional intelligence / Empathy
- Seek positive solutions and experiences
- Honest with oneself
- Supportive of others
- Openminded
- Question the status quo
- Break the "norm"
- Adaptable

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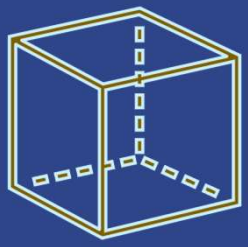
Boxed Thinking



Formed by

- Generational shapers
- Gossip / Fixations
- Past experiences
- Learned behavior/knowledge
- Narrow focus / tolerance
- Misunderstandings
- Assumptions

Causes

-Limits emotional intelligence

-Lack in motivation

-Decreased critical thinking

-Increased stress/insecurity

-Quick reactions

-Errors to occur

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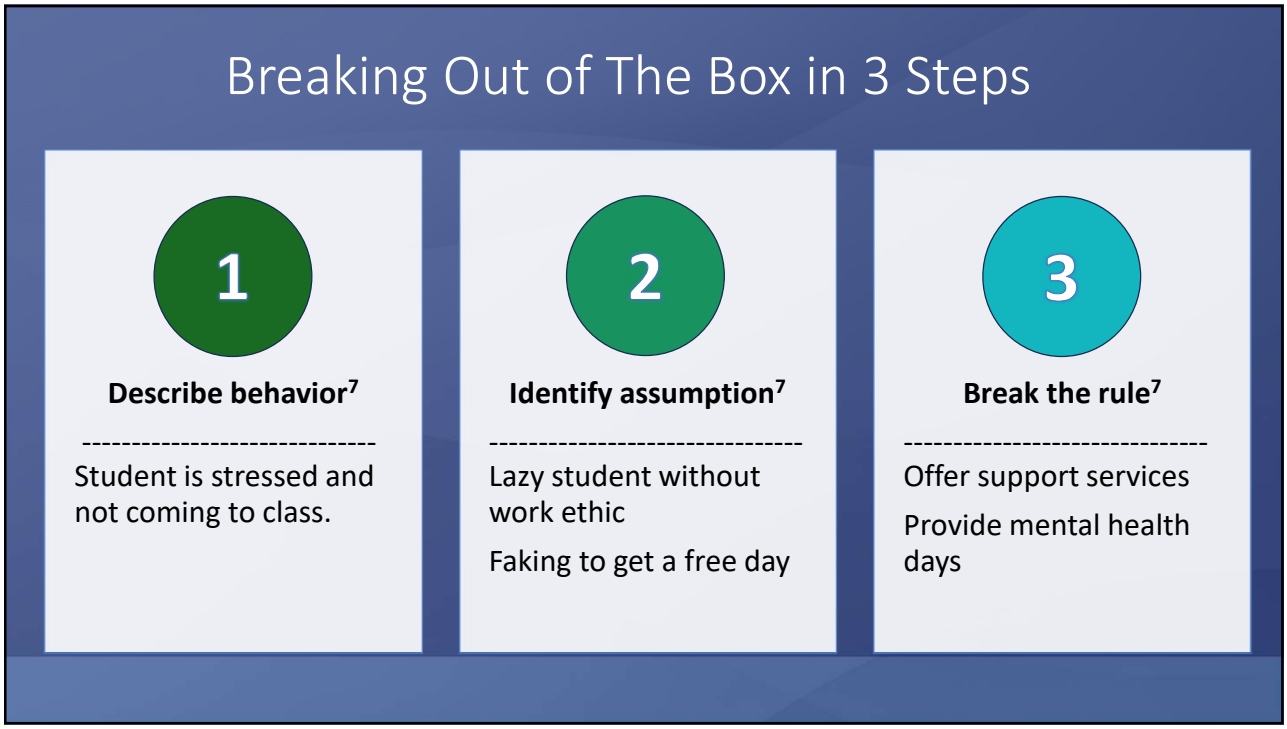

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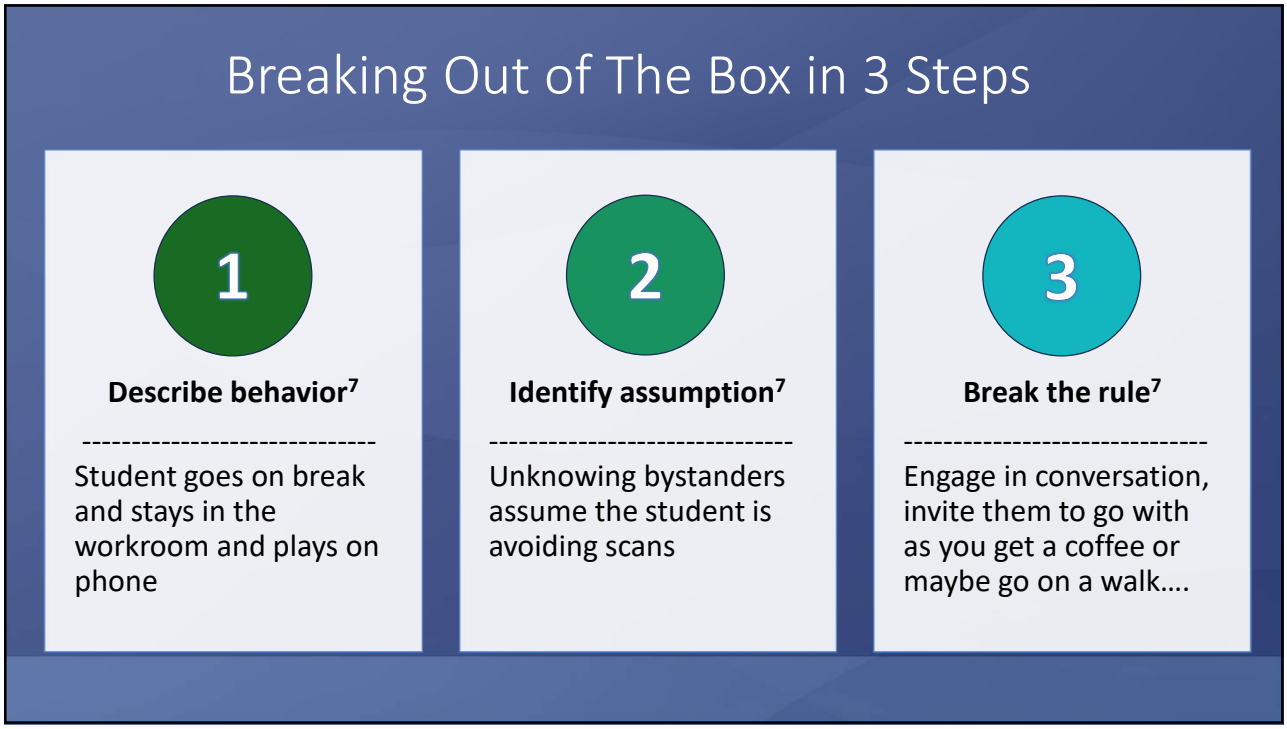

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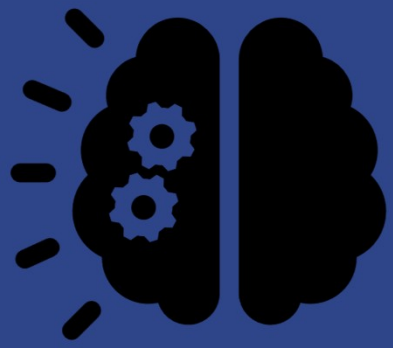
Out of Box Thinking



Maintains

- Open and honest SELF REFLECTION
- Active Listening
- Respect and empathy for others

Watch for Improved

- Emotional intelligence
- Understanding
- Motivation and drive
- Respectful constructive communication
- Clearer critical thinking
- Trust – Teamwork – Inclusion
- Improved self disposition

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Communication: *Perceptions and Assumptions*

"The Curse of Knowledge"[8]

- Can't unknow what is already known[9]
- Difficulty understanding how one wouldn't know something we may consider basic
- Critical thinking and knowledge transfer skills have become second nature
- Difficult to explain our processes / lose sight of the process/time it takes to learn
- Lack tangible evidence of other's critical thinking and knowledge transfer process

Influential Factors

Age / Gender / Personalities

-Generational shapers

-Formative experiences and support networks

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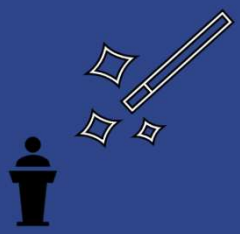
The Curse of Knowledge[8]

Student vs Preceptor



Student

- Need to be taught from experiences
- Need guidance through complexities
- Expect support, direction and guidance
- **Forming fundamental tasks of clinical reasoning**

Preceptor

- Rely on experience
- Successfully navigate complexities
- Assume immediate retention of concepts to apply as soon as they are taught them
- **Overlook foundational tasks of clinical reasoning**

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Knowledge Transfer / Critical Thinking



INTROVERT

Longer neurotransmission routes:[10]

Lower Stimuli Threshold
Distractable, reserved, quiet/shy, apprehensive, independent

Observational Learners
Contemplative and Practical Decision Makers

EXTROVERT

Shorter neurotransmission routes:[10]

Higher Stimuli Threshold
Expressive, dynamic, outgoing, loud, energetic/restless, positive

Adaptable Hands-on Learners
Decisive and Impulsive Decision Makers

30 – 50% of the population are introverts[11]

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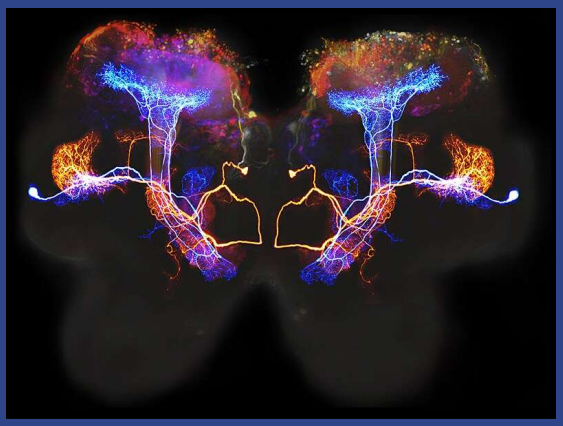
Understanding our Learning Mind



"Beta lobe neurons" by NICHD NIH is licensed under CC BY 2.0.

Cognitive Load Theory (CLT)[12]

Described by *John Sweller – Australian Psychologist (1980's)*

Dependent upon:

- Duration
- Amount
- Working Memory
- Long Term Memory
- Schemas

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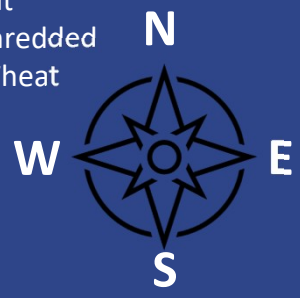
Schema Examples

Never
Eat
Shredded
Wheat





Roy G. Biv

Schmalz L. Drawings, 2026

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Personality Inclusion[11]

Introvert	Extrovert

• Need routine breaks
• Slow down
• Set parameters
• Delayed responses
  ○ Fear of not being correct
• Set aside time for Q/A and feedback
  ○ Private, specific, and written
	• Action seekers - collaborate with them
	• Enforce breaks
	• Include exam reflections
	• Impulsive responses
	  ○ Unafraid of being wrong
	• Verbal and hands on feedback
	  • Memory recall
	  • Highlight key points

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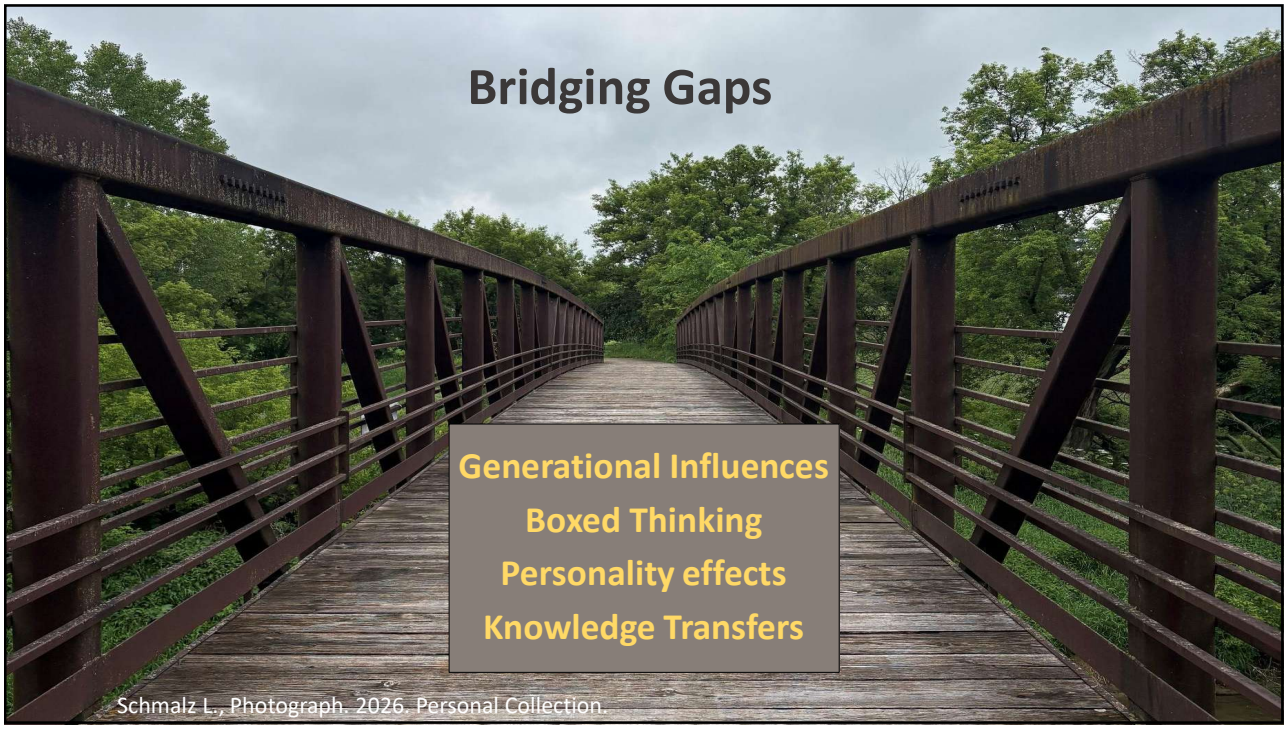

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Classroom to Clinical Practice Learning Strategies

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Preferred Learning Styles and Mediums Across Generations

Baby Boomers	Gen X	Millennials	Gen Z
Style: *Formal* Structured, factual, self reflective	**Style:** *Self directed* Interactive, engaged, curious, flexible	**Style:** *Hybrid* Interactive yet individualized digital connections	**Style:** *Electronic* Tech savvy, cautious and pragmatic multitaskers
Medium: *Traditional* Tangible resources: written material, textbook, content experts, experiences and perspectives	**Medium:** *Blended* Contextual relevance: literature and hands on, case studies, problem solving	**Medium:** *Technical* Contextual relevance On demand, links, prerecorded lectures	**Medium:** *Digital* Personalized micro learning: apps, QR codes, infographics, interactive games

Sources:[13, 14, 15]

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Preferred Communication Across Generations

Baby Boomers	Gen X	Millennials	Gen Z
Face to Face	Mixed for Efficiency *Email, Phone and In person*	Informal / Quick	Virtual Conferencing
Interactive, clear, small group, Q/As, meetings	Ongoing, clear, immediate, validating	Direct and frequent Driven by feeling understood, critiques evaluations	Concise, immediate feedback: texting, social media

Sources:[13, 14, 15]

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Challenges for Knowledge Transfers

"...**even though students felt prepared** for clinical practice, they were **unprepared for the added level of reality** in the clinical learning environment. Anxiety levels, feelings of apprehension and fear of making a mistake were viewed as possible **roadblocks** that can impede a student's capacity **to transfer learning.**"

Pearcey and Draper (2008)[16]

"...despite the amount of classroom and lab preparation, the **complexities of clinical learning environments** can place **extra challenges** on learning transfer... "

Kalyani et al. (2019)[16]

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Barriers

Top Categories:

- **46% - Imbalance of theory to practical reasoning**
- **29% -** Inconsistency and confusion between theory and practice, resulting in students adapting to preceptor information versus connections made in the classroom
- **21% -** Limited role modeling of preceptors; Lack of inclusion and acknowledgment of students
- **13% -** Lack of clinical relevance, case exposures and preceptor knowledge

2,501 reviewed articles, 28 met criteria for study[16]

Nurse Education in Practice: An integrative review[16]

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Assets

Facilitator/Preceptor characteristics that positively influence a student's knowledge transfer abilities.

- **38% - Knowledgeable and supportive**
- 21% - Incorporate strategies to promote connections
- 21% - Foster reflection
- 21% - Align theory to practice

2,501 reviewed articles, 28 met criteria for study[16]

Nurse Education in Practice: An integrative review[16]

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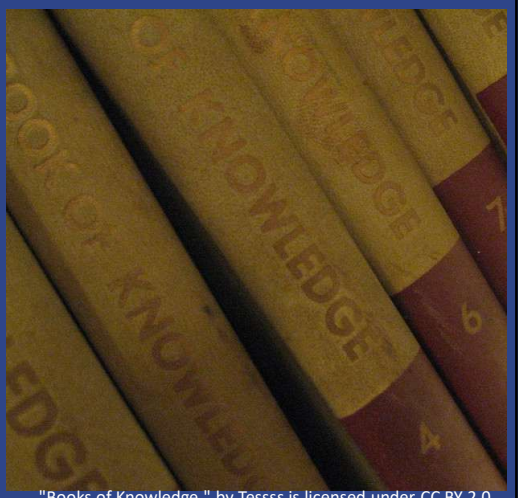
Facilitator Knowledge and Support

WHAT:

- Eases anxiety of students when in uncertain circumstances
  - Improved critical thinking and decision-making skills
- Instills trust, partnership, and positive learning environments

HOW:

- Foster an accepting and approachable demeanor
- Provide relatable experiences
- Incorporate guided learning/teaching moments
- Explain your thoughts / relatable analogies
- Provide reason behind statements
- Offer detailed relatable feedback



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Nurse Education in Practice: An integrative review[16]

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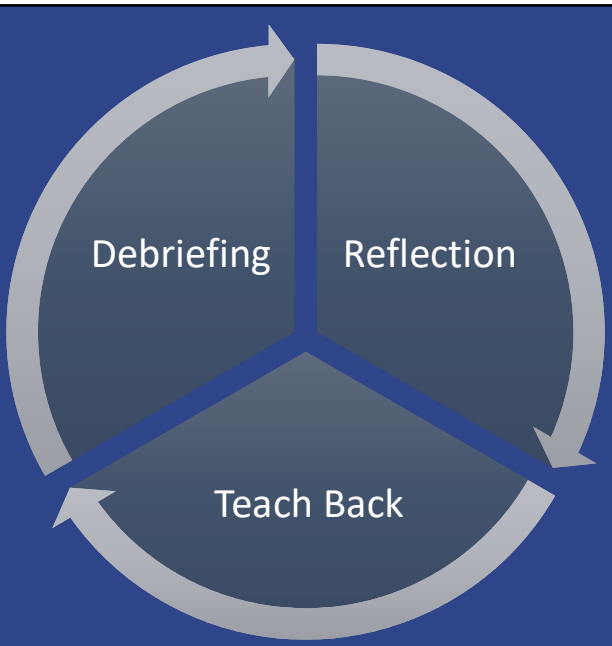
Teaching Strategies and Connections



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Debriefing / Teach Back Strategies

WHAT:

- Engages learners to pull from their working memory
- Connects theory to clinical practice (schemas - CLT)

HOW:

- Ask student their impression before writing up case
  - Seek reasoning to their impressions
- Quiz their knowledge
- Provided specific and detailed feedback

What…
Why…
How…

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Debriefing Activities

- Think-Pair-Share
  - Partnered
    1. individual reflection
    2. paired discussion
    3. share compiled information

    (Baby Boomer, Gen X)
- Role Reversal
  - Students explain/teach a concept

    (Baby Boomer, Gen X)
- One-Word Whips
  - Word summary of content/exam
  - Takeaways

    (Millennials, Gen Z)
- Visual reflections
  - diagrams, maps, to capture thought process.

    (Gen Z)

Source: Heick T.[17]

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Reflection Strategies

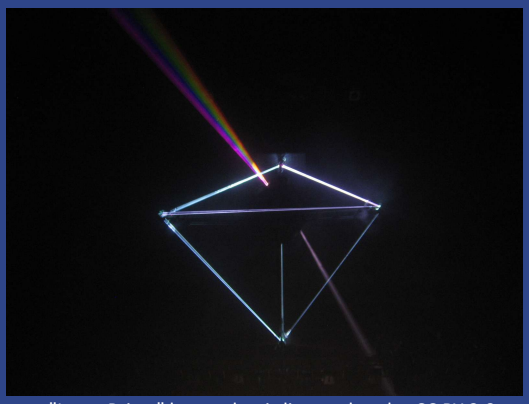
WHAT:

- Helps link/apply theoretical knowledge to the clinical environment
- Improves confidence which overtime instills better critical thinking and decision making

HOW:

3 actions

1 *Self/skill evaluation/awareness*
2 *Shifting focus: areas to work on*
3 *Apply gained knowledge: next case or future cases work on improvements*



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Source: Heick T.[17]

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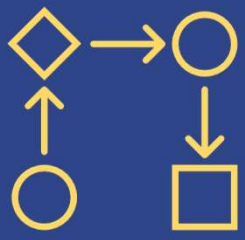
Reframing / Sentence Stems[8]

- *Let me back up and explain why this matters..."*
- *"For context, this connects to..."*
- *"The background you need to know is..."*
- *"This might seem obvious, but..."*
- *"What's not immediately clear is..."*
- *"The reason we do it this way is..."*
- *"The piece that's not visible is..."*



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3 – 2 – 1 Reflection



(All Generations)

Source: Heick T.[17]

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Daily Journal / Closing Reflection





Personal Text w/ Quick Summary

Baby Boomers, Gen X *(All Generations)* *Millennials, Gen Z*

Source: Heick T.[17]

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Exit Slips



All Generations

Source: Heick T.[17]

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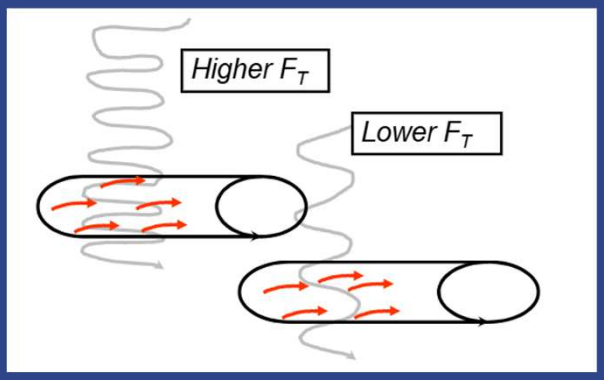
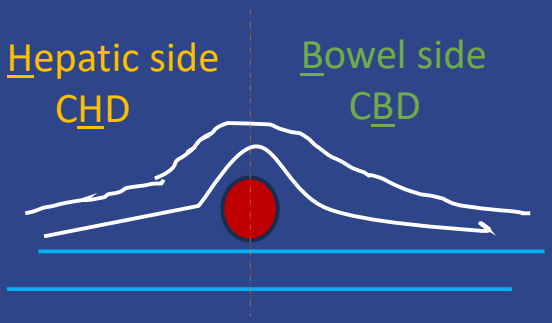
Sketch



CHD vs CBD in relation to Hepatic Artery



(Baby Boomer, Gen X, Gen Z)

Source: Heick T.[17]

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Theory and Practice

HOW:

- Hands on experience
  - Pathological processes
  - Organization of exams / Protocols
  - Reading room presentations
- Discuss findings
  - Cause/Effect (findings/lab work)
- Talk about optimization techniques when performed and why
  - *I.E. Dynamic Range, Wall Filter, Frequency*
- Review case studies/Teaching Files

All Generations

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Adaptation



- : adjustment to environmental conditions: as
- **a**
- **:**adjustment of a sense organ to the intensity or quality of stimulation
- **b**
- **:** modification of an organism or its parts that makes it more fit for existence under the conditions of its environment

Merriam-Webster Dictionary, October 7, 2025

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Knowledge Transfer

Support



Schema

Adaptation

Stimuli

Expectation

Feedback

Boxed Thinking

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Principles for Improving Interpersonal and Intergenerational Skills

- Don't make assumptions
- Set clear expectations via clear communication
- Focus on what matters vs preferences
- Timely pertinent feedback
- Willingness to adapt and listen

- *"… the problem isn't generational differences. It's the way we've been trained to ignore, oversimplify, or resent them. -Dr. Megan Gerhardt*[3]

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References

1. Human Resource Executive. *Engaging the workforce across generations: meeting the needs of the five distinct generations in today's workplace*. Workday; 2020. Accessed August 29, 2026. https://www.roanestate.edu/webfolders/PARKERS/placement/articles/staff/Engaging%20the%20Workforce%20Across%20Generations.pdf
2. Widman F, Strilko V. *Communicating across generations*. University of California, Santa Cruz Training & Development; 2014. Accessed August 29, 2026. https://www.readkong.com/page/communicating-across-generations-uc-santa-cruz-2175519
3. Gerhardt M. Out of respect: the generational divide hiding in 3 little words. Gentelligence. Published January 12, 2026. Accessed June 30, 2026. https://www.gentelligence.org/out-of-respect-the-sentence-that-changed-everything-for-me
4. Abrams J, von Frank V. Defining the generations. In: The Multigenerational Workplace: Communicate, Collaborate, and Create Community. Corwin Press; 2014:6-24. doi:10.4135/9781483387741.n2
5. Torpey E. Millennials in the labor force, projected 2019-29. *Career Outlook*. U.S. Bureau of Labor Statistics. November 2020. Accessed October 3, 2024. https://www.bls.gov/careeroutlook/2020/data-on-display/millennials-in-labor-force.htm
6. The Arbinger Institute. *Leadership and Self-Deception: Getting Out of the Box*. 2nd ed. Berrett-Koehler Publishers; 2010.

51

References

7. Supper P, Urban D, Acker I, Linke FS, Kienast P, Praschinger A, Anvari-Pirsch A. A concept for adapting medical education to the next generations via three-staged digital peer teaching key feature cases. Wien Med Wochenschr. 2023;173(5-6):108-114. doi:10.1007/s10354-022-00990-7
8. Gerhardt M. When common sense isn't common across generations: the curse of knowledge. Gentelligence. Published September 12, 2025. Accessed June 30, 2026. https://www.gentelligence.org/have-you-heard-of-the-curse-of-knowledge
9. Murthy B. The "tappers & listeners" experiment: a deep dive into communication. *LinkedIn*. Published June 1, 2024. Accessed June 30, 2026. https://www.linkedin.com/pulse/tappers-listeners-experiment-deep-dive-communication-murthy-bjas-uglxc
10. Guy-Evans O. Introvert vs. extrovert personality: signs, theories, and differences. Simply Psychology. Updated January 29, 2024. Accessed September 22, 2025. https://www.simplypsychology.org/introvert-extrovert.html
11. Stalburg CM, Lehmann W, Bierer SB, Simpson D. Inclusion and belonging for introverts (and extroverts) in graduate medical education. *J Grad Med Educ*. 2024;16(6):747-748. doi:10.4300/JGME-D-24-00925.1.
12. Practical Psychology. *Cognitive load theory (definition + examples)*. Published October 6, 2023. Accessed September 22, 2025. https://practicalpie.com/cognitive-load-theory/

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References

13. Moore G, Parker S, Baksh L. Generational learning preferences: target patient teaching to match generational and individual needs. *Am Nurse J.* 2021;16(12):26-31.
14. How the key to engagement may lie in unlocking generational loyalties. The Tilt Institute. Published May 19, 2023. Accessed June 30, 2026. https://www.thetiltinstitute.com/tiltthink/2023/5unlocking-generational-loyalties
15. Bridging generational gaps: how different generations approach learning. *LearnToStudy.net*. Accessed June 30, 2026. https://learntostudy.net/blog/learning-styles/bridging-generational-gaps-how-different-generations-approach-learning/
16. Carless-Kane S, Nowell L. Nursing students learning transfer from classroom to clinical practice: an integrative review. *Nurse Educ Pract*. 2023;71:103731. doi:10.1016/j.nepr.2023.103731
17. Heick T. 15 activities to help students review and retain new information. *TeachThought*. Accessed June 30, 2026. https://www.teachthought.com/learning-posts/reflection-strategies/

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