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CALIFORNIA STATE UNIVERSITY, LOS ANGELES

What we know about learning (so far)

Inaugural Innovations in Health Occupations Education Conference

Catherine Haras

Keynote speaker

Senior Director, Center for Effective Teaching and Learning

January 12, 2017 Ontario, CA

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CALIFORNIA STATE UNIVERSITY, LOS ANGELES

Back Channel!

https://todaysmeet.com/HWI17

Please go to this link and keep it handy on your mobile device during the presentation.

Handouts used in this session:

- Color cards, which will serve as “clickers”
- “Exam wrappers” which you can use to reflect with as I give the keynote

Raise your hand if you don’t have these.

Let’s practice:

People learn material better when they have to teach it to someone else.

A) TRUE (Raise the PINK card)
B) FALSE (Raise the GREEN)
C) Don’t Know (Raise the ORANGE)

How did so many of us know this is true?
Why did so many people answer this question correctly?

John Bransford, 1994

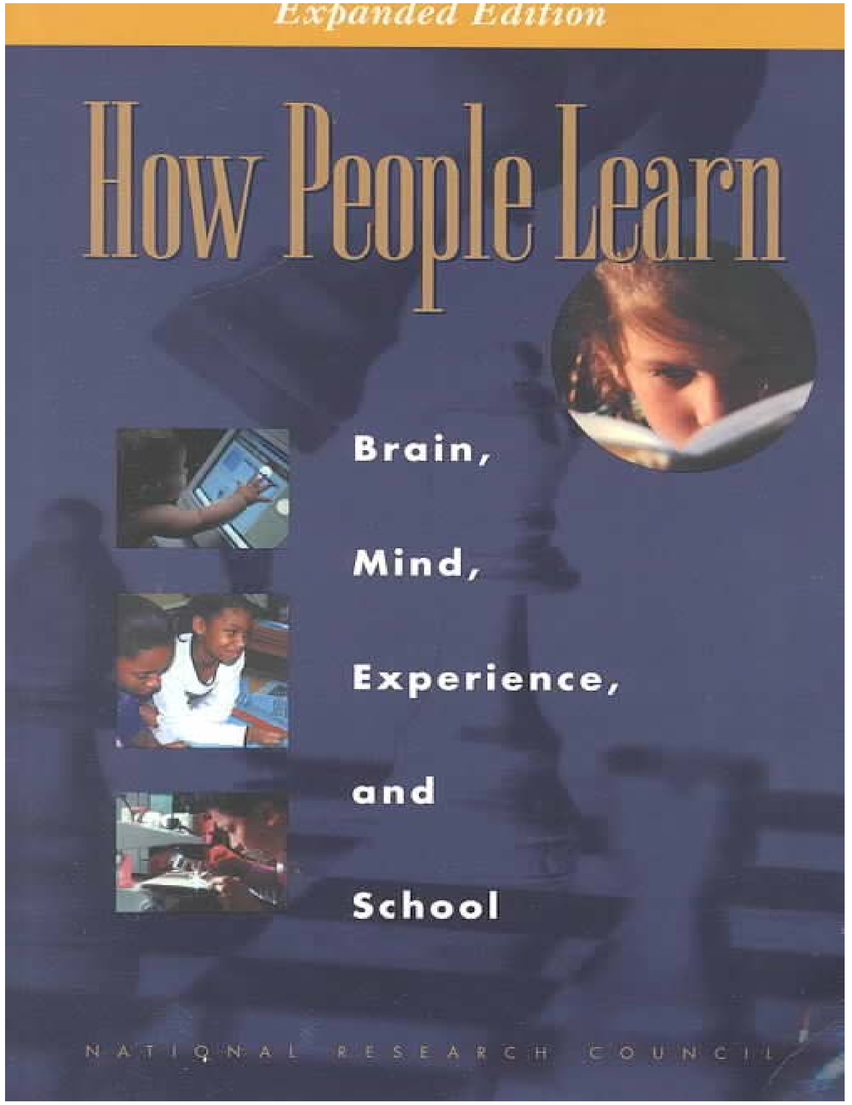
Where we are:

We are starting to get a better idea of how learning works.

Every time you learn something new, your brain changes.

How People Learn:
Brain, Mind, Experience, and School
(Bransford, Brown & Cocking, 1999)

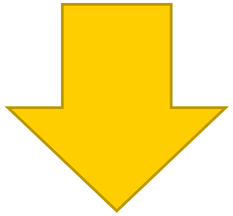
PDF free online at National Academy of Sciences (NAS)



Mini-Lecture: *How People Learn*
Lecture Wrapper

As you listen to the mini-lecture on *How People Learn,* connect the three key findings to your teaching.

Reflect on your teaching and students as you address the questions on the left-hand side.



Lecture on *How People Learn* – Connections to Your Teaching
1. What prior knowledge do students bring to your class? What are the common misconceptions?
2. What differences exist between experts and novices in your discipline?
3. What self-regulated learning / self-awareness strategies are most valued in your discipline?

How People Learn

Bransford, Brown and Cocking, 1999

2-year study conducted by the Committee on Developments in the Science of Learning (National Research Council), which ran a meta-analysis of hundreds of studies on cognition, learning, development, culture, and the brain.

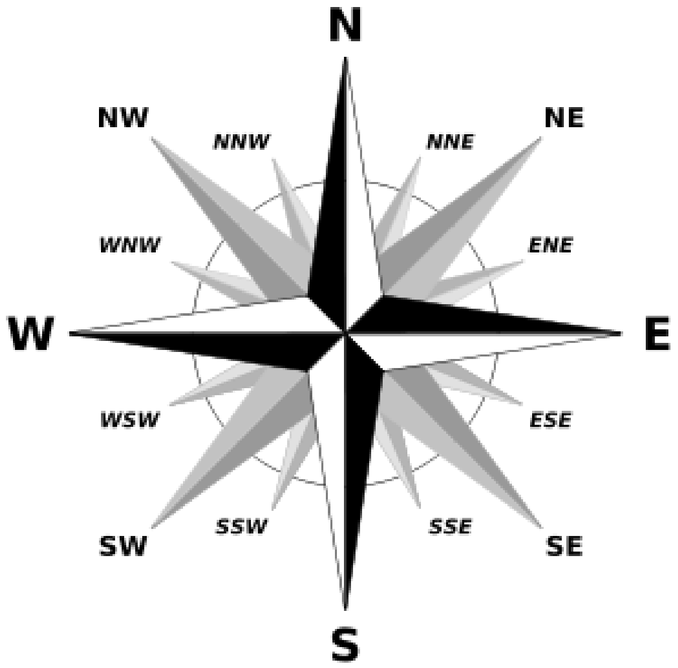
Bransford, Brown and Cocking found three overarching themes.

Prior Knowledge

1.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2004). *How people learn.* Washington, DC: National Academy Press.

If I say **cardinal**
you think of: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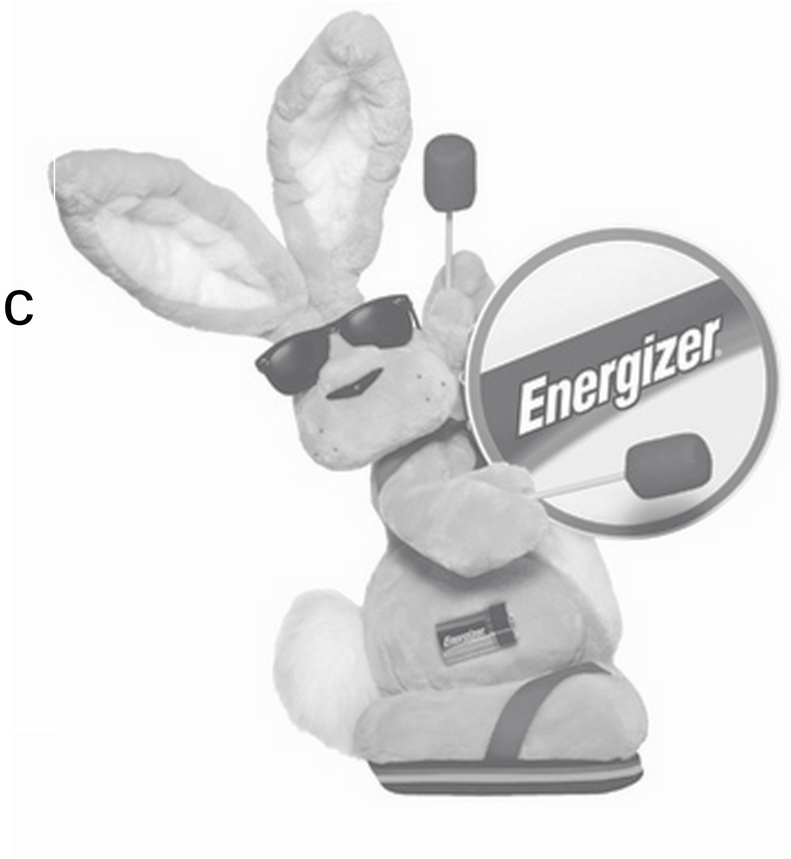
What about **battery**?

Battery

TECHNOLOGY	A container consisting of one or more cells, in which chemical energy is converted into electricity.
MEDICINE	A group or series of tests administered for analytic or diagnostic purposes.
LAW	An intentional act causing harmful or offensive contact with the 'person' of another.



Battery

MILITARY SCIENCE An indefinite number of guns placed together in the same position.

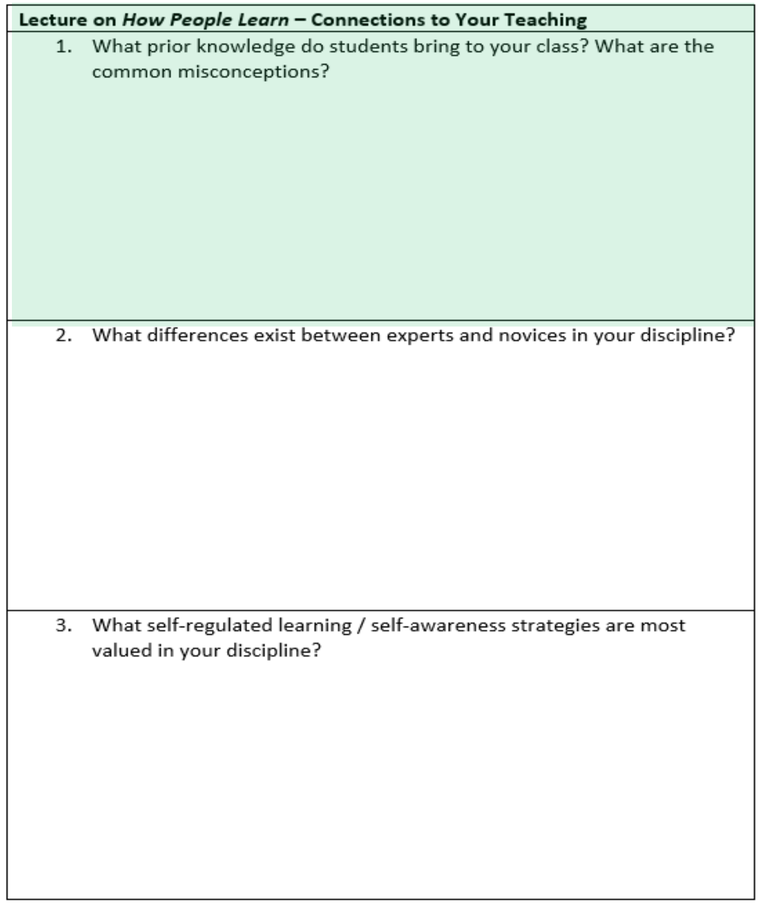
MUSIC A term used in Baroque music for the practice of arpeggiating passages notated as chords.

SPORTS In baseball, the pitcher and catcher.

Prior Knowledge

What prior knowledge do students bring to your class about your subject?

What are the common misconceptions?



Lecture on *How People Learn* – Connections to Your Teaching

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Prior Knowledge

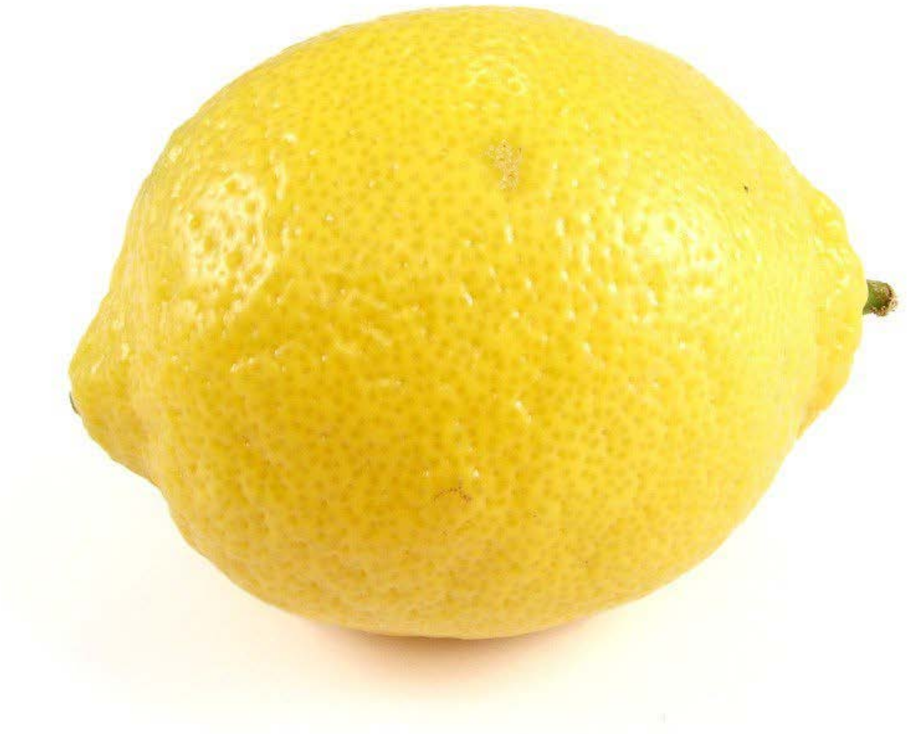
“Students come to the classroom with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are taught, or they may learn them for purposes of a test but revert to their preconceptions outside the classroom.”

“Pucker” by April Maciborka & David Wile

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn.* Washington, DC: National Academy Press.

Prior Knowledge

Learners with incorrect prior knowledge potentially resist change.



Prior knowledge scenarios

“There’s a nursing shortage so it’s easy to get a job.”

“This course has nothing to do with my major.”

“My child development prof says spanking is wrong- but it worked for me.”

Reflect on a situation you experienced where a student’s prior knowledge dominated her ability to learn.

Individual learners show preferences for the mode in which they receive information (e.g., visual, auditory, kinesthetic).

A) TRUE (PINK card)
B) FALSE (GREEN)
C) NO CLUE (ORANGE)

Learning styles (i.e. *verbal* or *visual* learners) are not supported by empirical research.

A) TRUE (PINK card)
B) FALSE (GREEN)
C) NO CLUE (ORANGE)

Both statements are **true.**
Did your prior knowledge about ‘learning styles’
get in the way of hearing me say it’s not proven?

Results demonstrated no statistically significant relationship between learning style preferences (auditory, visual word) and learning comprehension based on instructional method. The study did find that instructors appealed to visual as opposed to auditory learning modes.

- Rogowsky, Calhoun, & Tallal (2014)

Research suggests that ‘learning styles’ (Lilienfeld, Lynn, Ruscio, & Beyerstein, 2010; Pashler, McDaniel, Rohrer, & Bjork, 2009; Rogowsky, Calhoun & Tallal, 2014; Willingham, 2009), **left brain-right brain theory** (Alferink & Farmer-Dougan, 2010; Dekker, Lee, Howard-Jones, & Jolles, 2012; Gazzaniga, 1985, 2002, 2015; Lilienfeld, et al., 2010; Lindell & Kidd, 2011; Willingham, 2009, 2010), **and ‘multiple intelligences’** (Waterhouse, 2006) **do not exist**.

I’m sorry!

“There are different abilities, but really, we all learn the same way.”

– Daniel Willingham, 2009

Why don't students like school: A cognitive scientist answers questions about how the mind works and what it means for the classroom.
Jossey-Bass, 2009.

Bransford, Cocking & Brown’s meta analysis

Key Finding 1:

Prior knowledge <u>matters</u>.

Take advantage of it.

Things you might consider surveying in your classroom

Attitudes (learned predispositions)

Beliefs (Personal knowledge/behavioral)

Values (Enduring beliefs)

Interests (Personal/situational preferences)

Self-Concept (Self-evaluations)

Self-Efficacy (Self-perceptions of an ability to do something specific)

Incorporating ‘prior knowledge’: Re-present content for students

- Use analogy and metaphor to link what they know with what you want them to learn.

- Replace naïve with scientific understanding by giving students the opportunity to reveal their understanding as naïve—to see where it falls short.

ONCE UPON A TIME…

Evolution wired our brains for storytelling.

- Storytelling puts our entire brain to work.
- It connects **prior knowledge** with something new.
- This is why everyone loves a story.

THE END

Experts and Novices

2.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2004). *How people learn.* Washington, DC: National Academy Press.

Experts v. Novices

What differences exist between experts and novices in your discipline?

Lecture on *How People Learn* – Connections to Your Teaching
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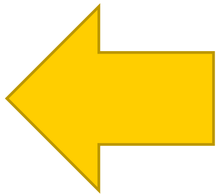


Experts

Their knowledge is well organized.

They recognize patterns.

Organizational sensemaking allows for easy retrieval of relevant knowledge.

What is ‘expertise’?

To develop competency a novice must:

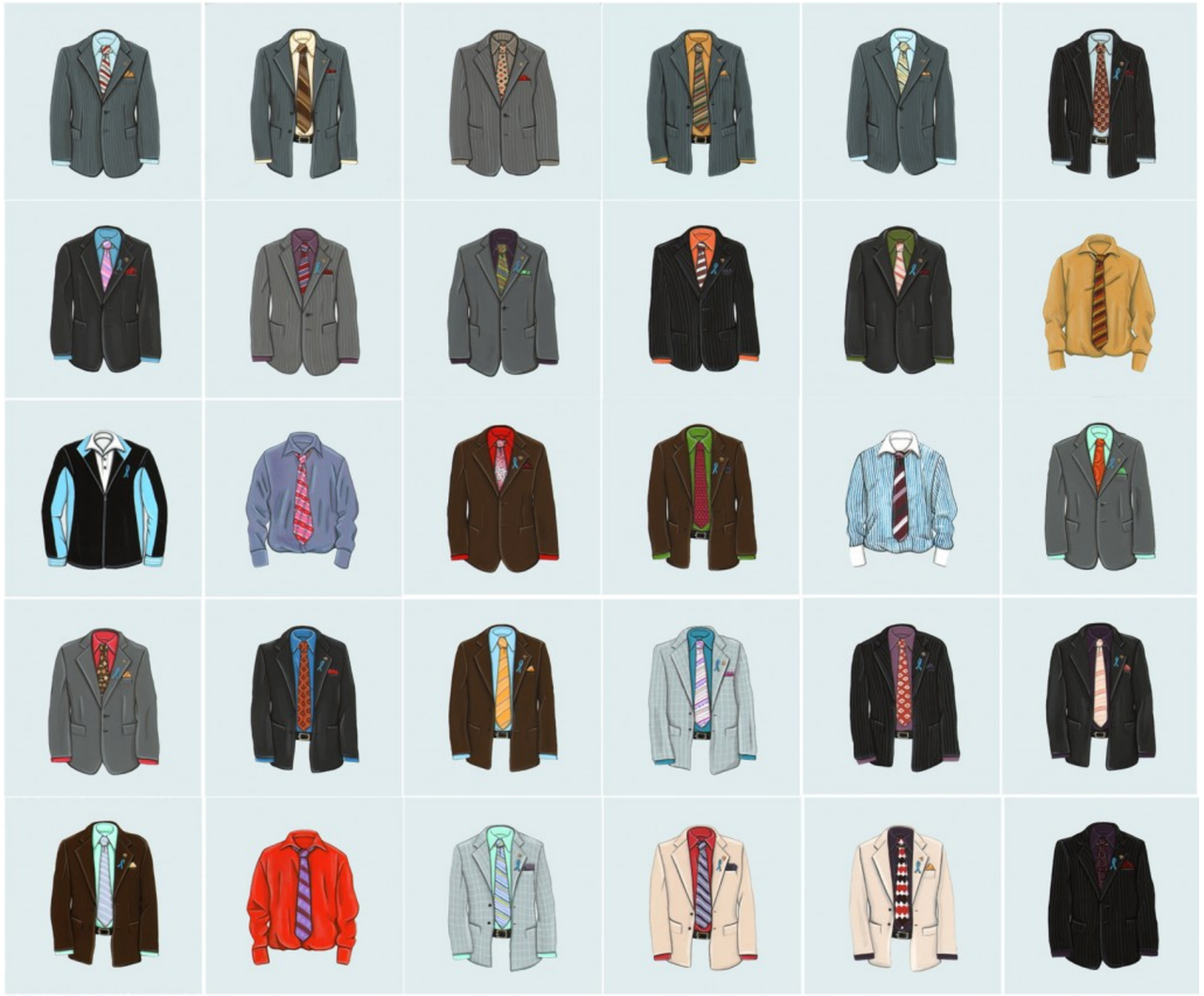
1. Have a deep understanding of factual knowledge

2. Understand this knowledge within the context of a conceptual framework

3. Organize this knowledge in ways that facilitate retrieval and application

Bransford, Cocking & Brown, 1999

Experts (you)



Kiersten Essenpreis

Novices (Students)

Novice learners need to practice and will make mistakes.

That’s okay.

Naïve Versus Skillful Learners

Naïve Learner Characteristics

Non-specific goals

Self-handicapping strategies

Avoid self-evaluation

Attribute ability

Cannot adapt

Not interested

Skillful Learner Characteristics

Self-regulating

Set goals

High self-efficacy

Seek self-evaluation

Practice

Can Adapt

Intrinsically interested

Zimmerman, 1990

Trying to solve a problem before being taught the solution leads to better learning, even if your first answer is wrong.

A) TRUE (PINK card)
B) FALSE (GREEN)
C) NO CLUE (ORANGE)

True. Students given hands-on exercises **before** they do assigned readings (or watch videos) outperform students who read or watched first.

-Blikstein and Pea, 2013

Preparing for future learning with a tangible user interface: The case of neuroscience. *IEEE Transactions on Learning Technologies*, 6. 2013.

People learn by failing.

A) TRUE (Pink)
B) FALSE (Green)
C) NO CLUE (Orange)

Bransford, Cocking & Brown’s meta analysis

Key Finding 2:
Novices are not experts.

They learn differently and think differently about your discipline than you do.

Novices are experts in the making.

- Superficial coverage of topics does not bridge the expert-novice gap.
  Better: Fewer topics that examine key concepts in the discipline.

- Allow students to grasp the defining concepts in specific domains within a discipline by spending time on these.

- Be **explicit** about the habits of mind and specific ways of knowing that your discipline **values**.

- Model the decision-making process in your discipline for your students.

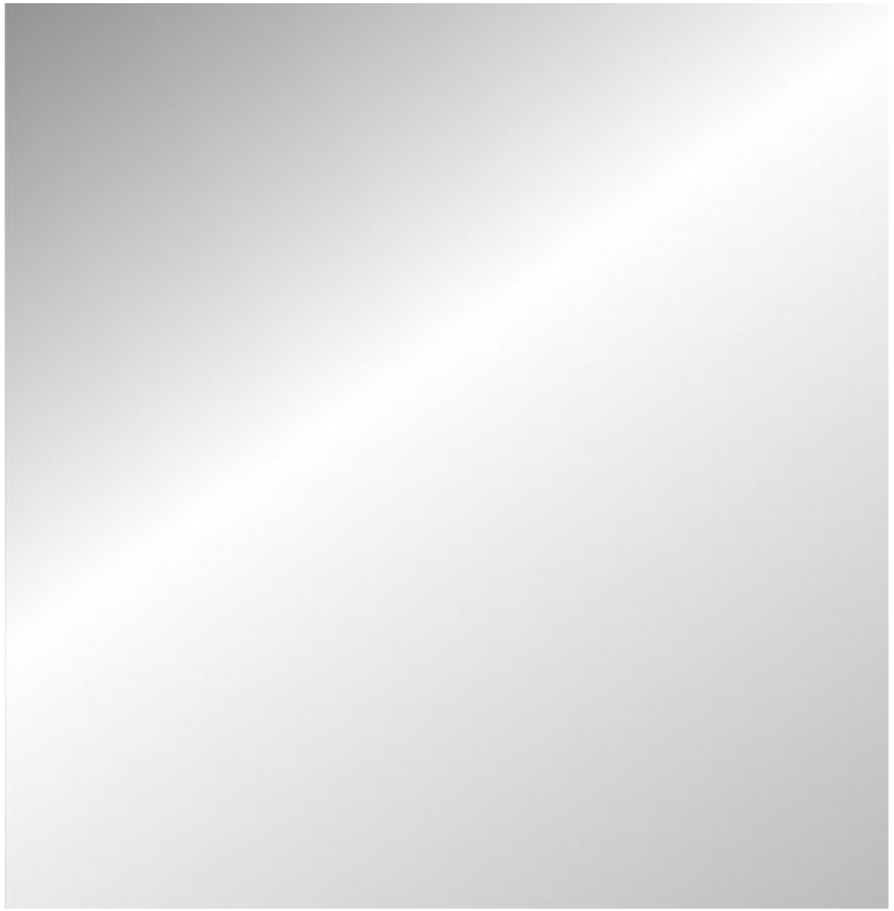
Metacognition

3.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2004). *How people learn.* Washington, DC: National Academy Press.

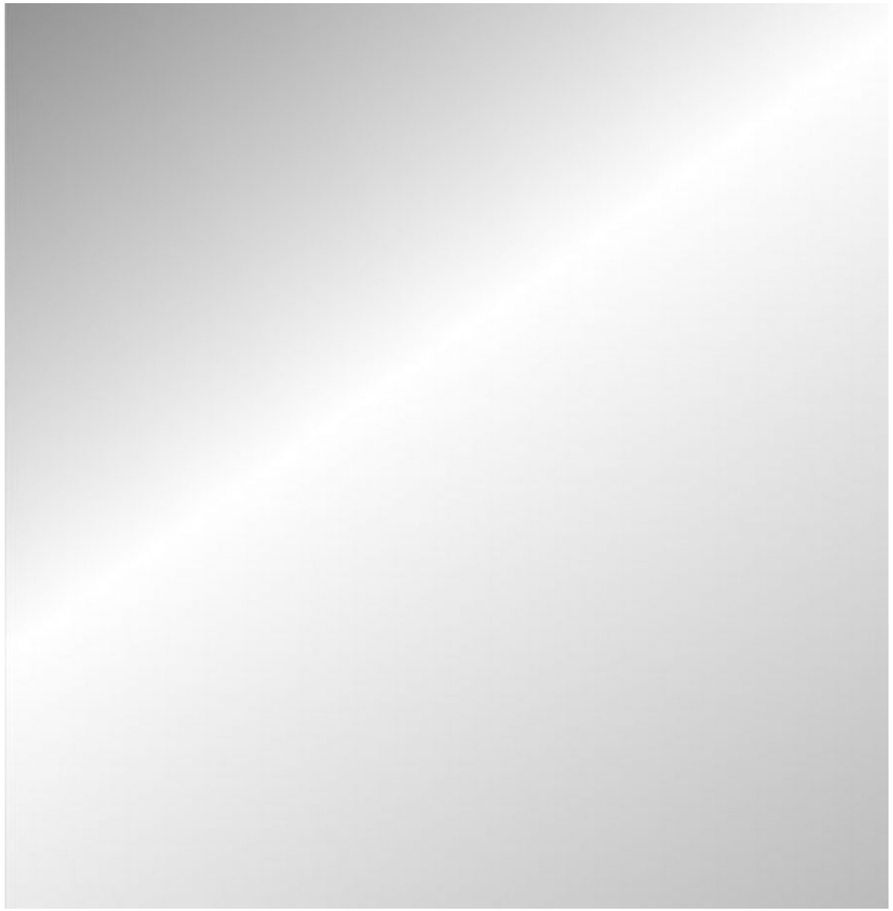
Metacognition

“Thinking about one’s thinking” (Flavell, 1970)



Metacognition

‘Knowing about knowing’
Self-awareness
Monitoring
Goal-setting
Mindset



Metacognition: 3-2-1

3. Three things you learned today

2. Two things you want to know more about

1. One thing you will apply in a course you teach

I could share my outcomes for this keynote with you:

1. Set the tone for the rest of the day
2. Create a learner-centered environment
3. Persuade you of something you hadn't seen, known, or believed before, based on my experience and empirical evidence
4. Get you to reflect on your own teaching identity as this impacts your good work

I could make the design of this keynote visible:

- **Clicker questions**: Engagement; activated your thinking and prompted self-regulation
- **Mini-Lecture:** Framework
- **Exam wrapper:** Cognitive work in collaboration with peers; further tapped your prior knowledge and helped you to self-assess
- **Interleaved practice:** mixed up the concepts so you have to make connections
- **This slide:** Transparency and role-modeling
- **Next/concluding activity:** Metacognition, Self-Regulation in your own teaching
- **Reflection**: How do audience members see yourselves within the context of this keynote?

Metacognition

What self-regulated learning / self-awareness strategies are most valued in your discipline?

Lecture on *How People Learn* – Connections to Your Teaching
1. What prior knowledge do students bring to your class? What are the common misconceptions?
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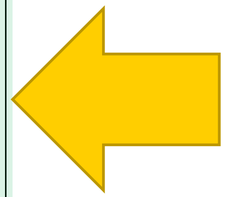


Example: Self-regulating strategies in LAW

Know where your feelings end and those of your clients begin.

Understand your personal values and their influence on the client relationship.

Realize how you influence outcomes.

Recognize and manage internal dialogue.

Understand and control personal defense mechanisms.

Know when and how clients are reacting to your style.

Modify behavior based on reactions of clients.

Naïve Versus Skillful Learners

Naïve Learner Characteristics

Non-specific goals

Self-handicapping strategies

Avoid self-evaluation

Attribute ability

Cannot adapt

Not interested

Skillful Learner Characteristics

Self-regulating

Set goals

High self-efficacy

Seek self-evaluation

Practice

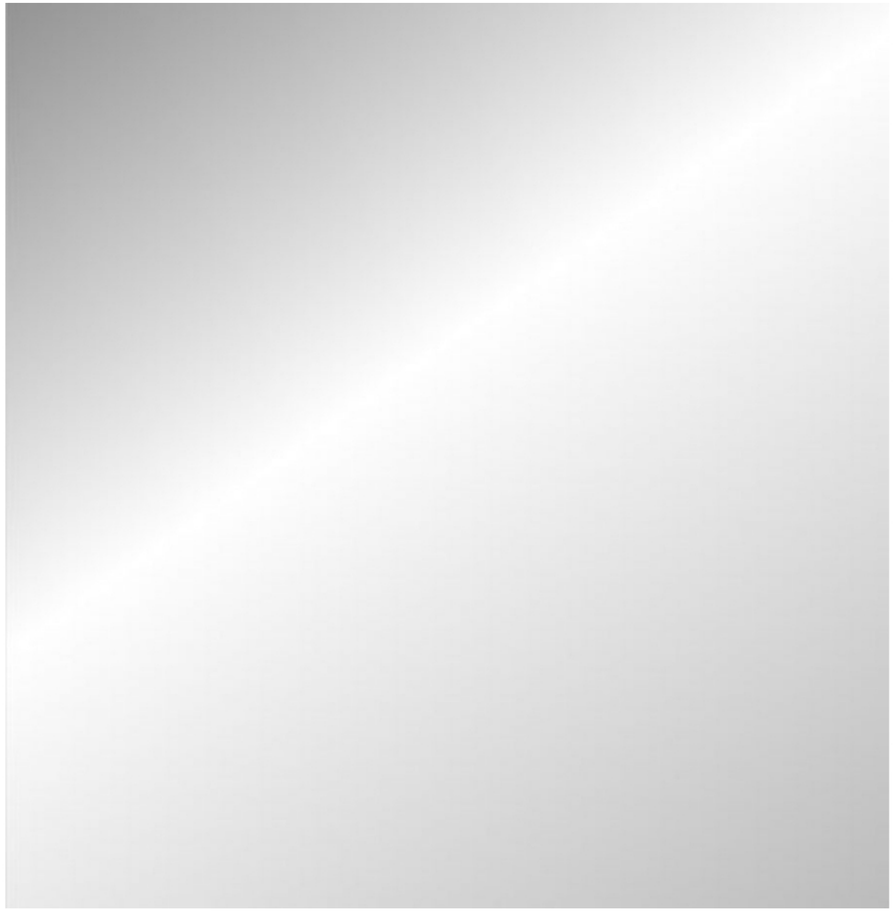
Can Adapt

Intrinsically interested

Zimmerman, 1990

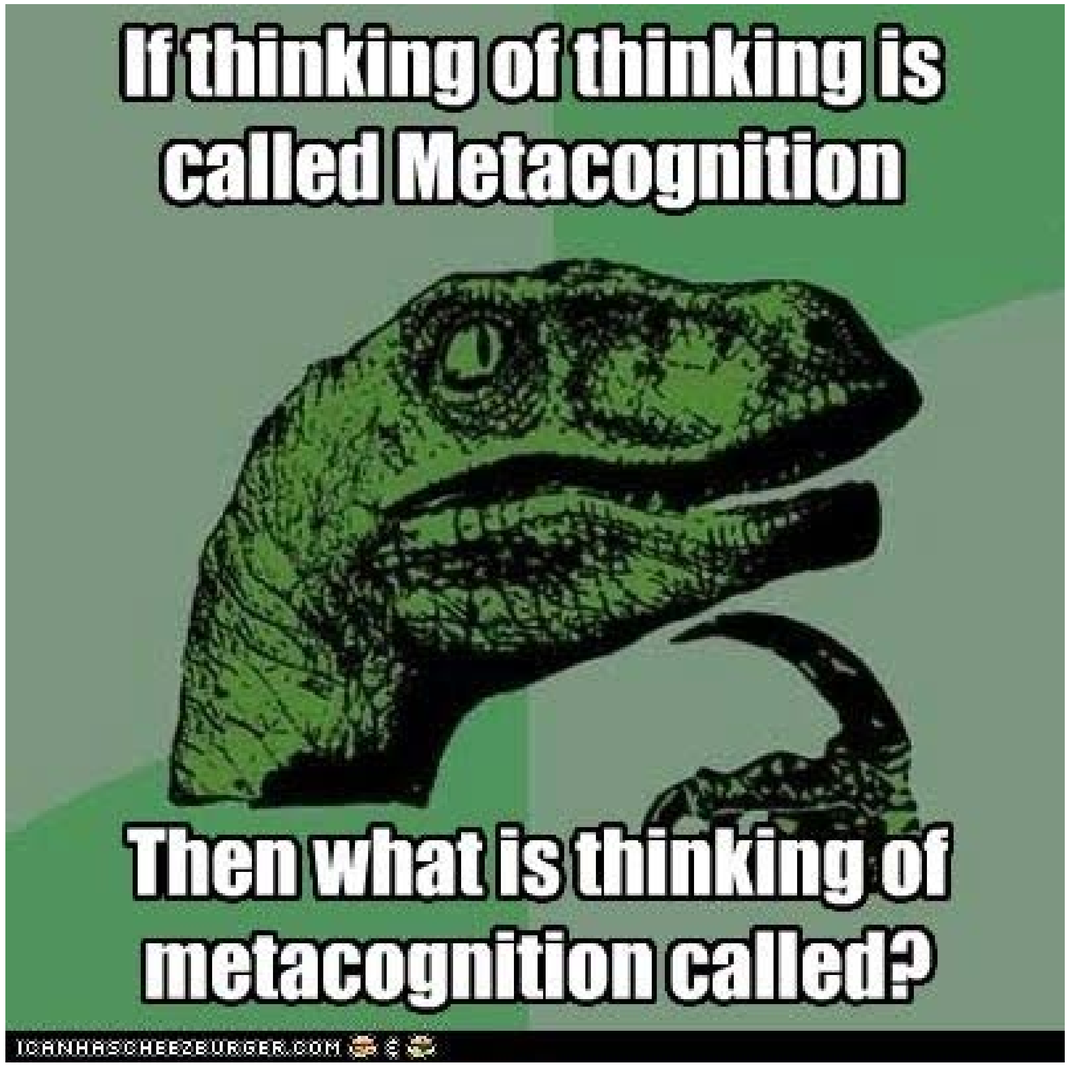
Metacognition

“A metacognitive approach to instruction can help students learn to take control of their own learning by defining learning goals and monitoring their progress in achieving them.”



Bransford, J. D., Brown, A. L., & Cocking, R. R. (2004). *How people learn.* Washington, DC: National Academy Press.

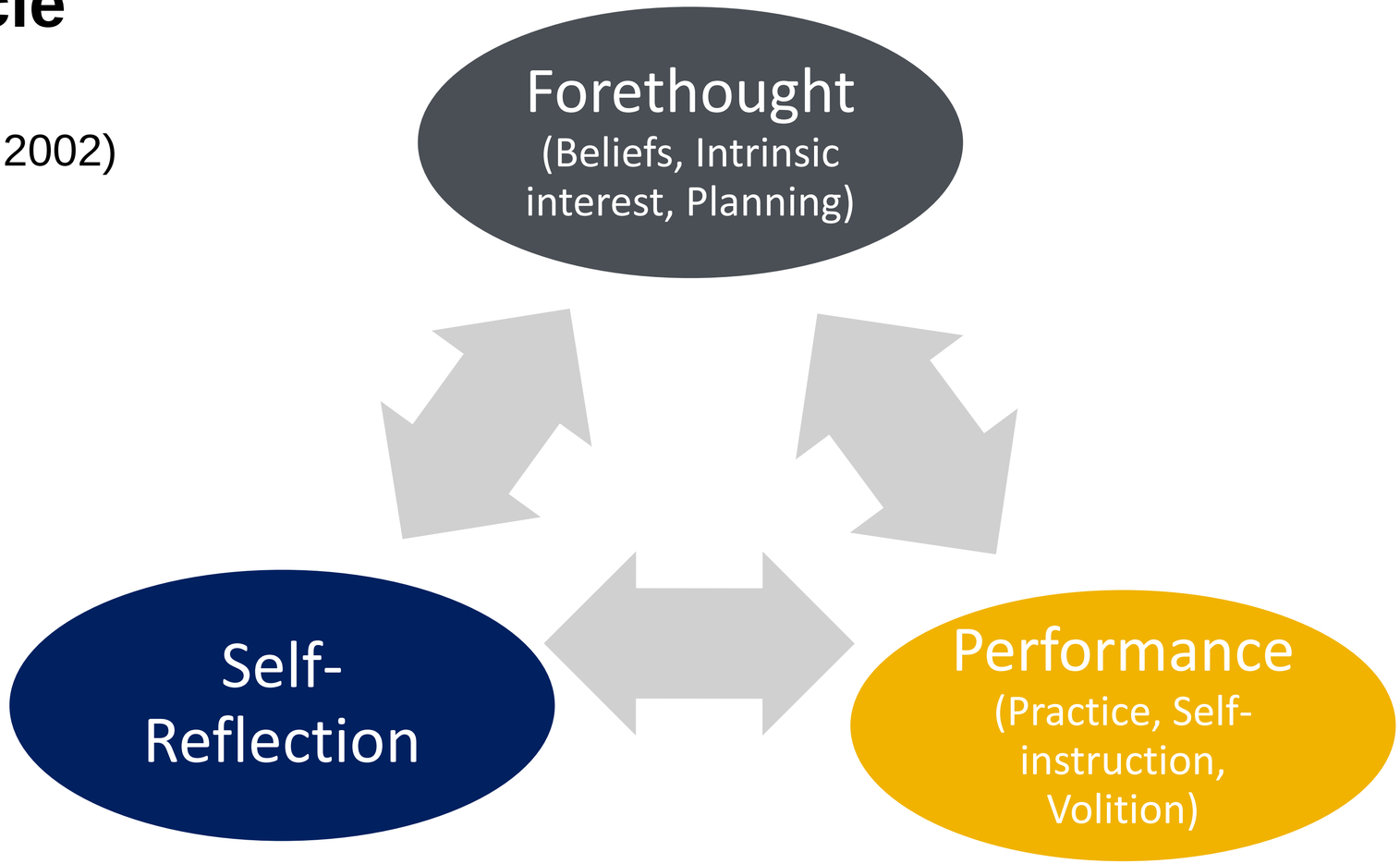
Metacognition can be harnessed to create greater mindfulness.



Bransford, J. D., Brown, A. L., & Cocking, R. R. (2004). *How people learn.* Washington, DC: National Academy Press.

Self-Regulated Learning Cycle (SRL)

-(Zimmerman, 1990, 2002)



People’s beliefs about their own abilities have a profound influence on their motivation to learn.

A) TRUE (Pink)
B) FALSE (Green)
C) NO CLUE (Orange)

Reflection is a powerful form of practice which leads to greater learning.

A) TRUE (Pink)
B) FALSE (Green)
C) NO CLUE (Orange)

Tap into metacognition via prior knowledge.

How could your students' misconceptions be addressed on the first day?

Use your Today's Meet to brainstorm.

Metacognition in the classroom

- ❑ Give students license to identify confusion via course work and classroom culture
- ❑ Integrate reflection into credited course work
- ❑ Model the process for your students: *What are the thinking processes in your field? How do you solve problems?* Be explicit.

Tanner, 2012

Try metacognition in the classroom

❑ Integrate metacognitive instruction with discipline-based learning to enhance student achievement and develop independent learning.

❑ Teach students to be strategic, self-reliant, and flexible.

❑ Developing strong metacognitive strategies and learning to teach those strategies in a classroom environment should be standard features of the curricula in schools of education.

Bransford, Brown & Cocking, 2000

Metacognitive assignment examples

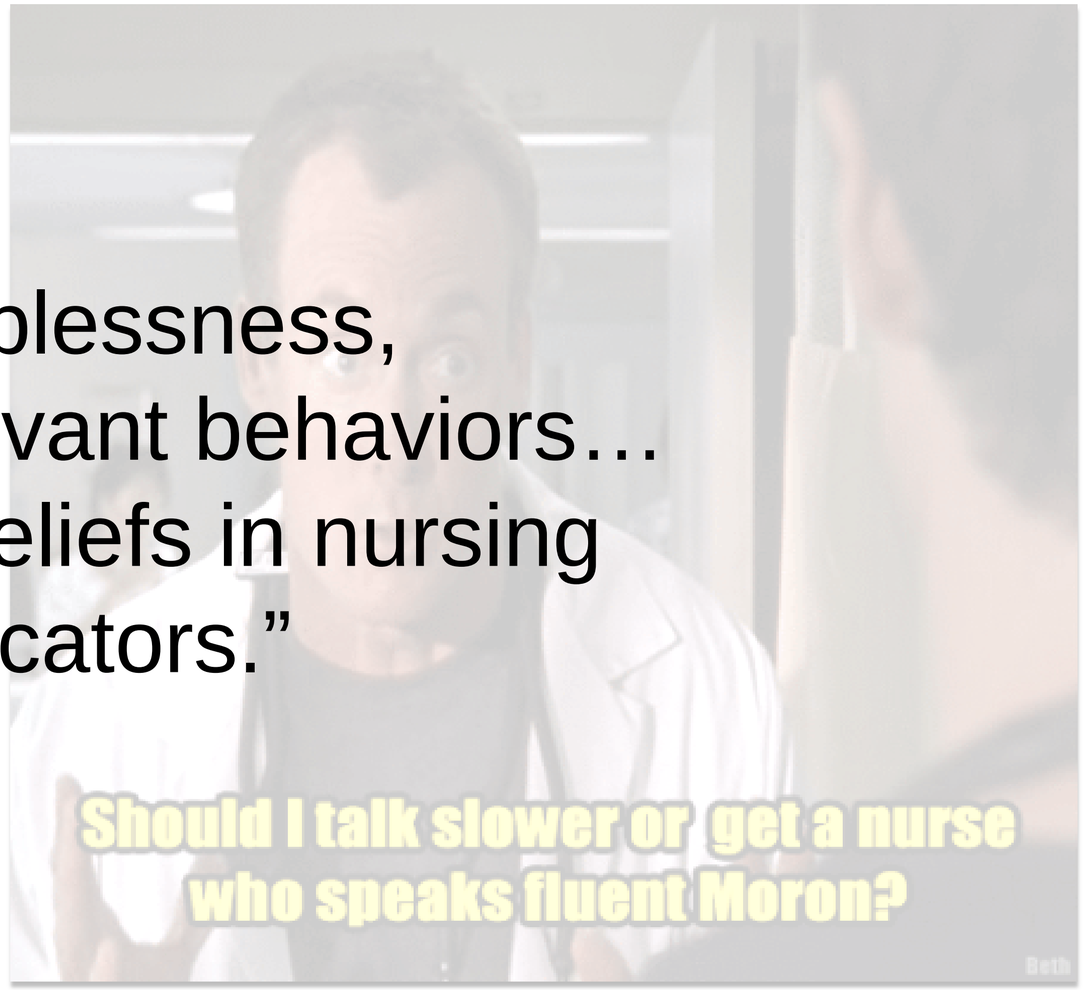
Pre-assessment: Encourage students to examine their current thinking

The Muddiest Point: Give students practice in identifying confusions

Retrospective post-assessments: Push students to recognize conceptual change

Reflective journals or discussion postings: Provide a forum for students to self-monitor

“Maladaptive behaviors include self-handicapping, learned helplessness, task avoidance, and task-irrelevant behaviors… Promoting positive, adaptive beliefs in nursing should be a goal for nurse educators.”



Nursing student retention: Understanding the process and making a difference. Jeffreys, 2015.

Key Finding 3:

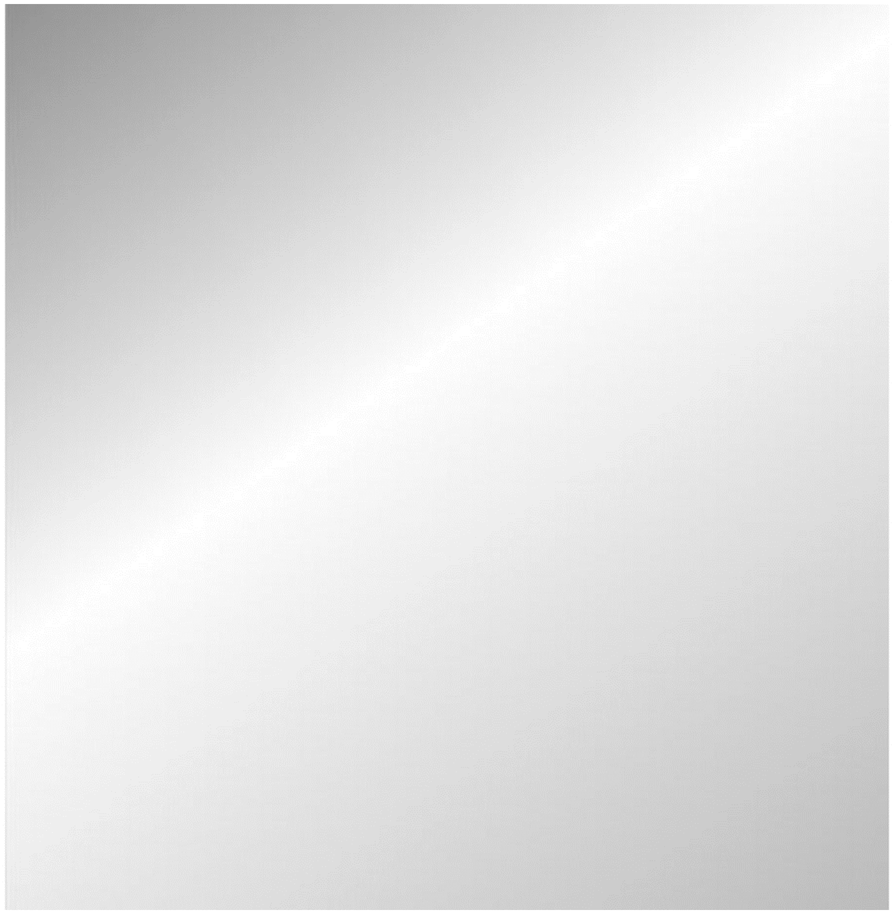
Metacognition works to bridge the expert-novice gap.

Experts

Metacognitive skills even matters to types of expertise:

Adaptive experts: Can transfer knowledge from one setting to another

Routine experts: Function well in a standard, context-dependent setting



Let’s review

1. Prior Knowledge
2. The difference between experts and novices
3. The role that metacognition plays to bridge the gap between expert and novice thinking

Learning is actually quite difficult
--and we are not good judges of our own learning.

Mini-Lecture: *How People Learn* Lecture Wrapper

Place the handouts side by side. Use the right side to structure your reflection of the session and activities you've experienced so far.

Place side by side

Lecture on *How People Learn* – Connections to Your Teaching	Reflect on Our Session
1. What prior knowledge do students bring to your class? What are the common misconceptions?	1. How have we leveraged your prior knowledge today?
2. What differences exist between experts and novices in your discipline?	2. How have we helped you bridge the gap between expert and novice? What frameworks have we used?
3. What self-regulated learning / self-awareness strategies are most valued in your discipline?	3. How have you thought about your own learning today?

You must be interested in teaching to improve your teaching.

A) TRUE (Pink)
B) FALSE (Green)
C) NO CLUE (Orange)

Good teaching practice is largely independent of the discipline.

A) TRUE (Pink)
B) FALSE (Green)
C) NO CLUE (Orange)

Both statements are **true.**

Intrinsic interest is a precondition for improved learning.

Excellent teaching, like learning, is pretty much done the same way. Self-awareness will help.

Zimmerman, B.J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist, 25*(1), 3-17.

Prior knowledge scenarios

“In my class you either get the material or you don’t.”

“Students are not as well prepared as they used to be.”

“Students need to be spoon fed.”

“My students don’t pay attention in class.”

Name a situation you experienced where your prior knowledge dominated your ability to teach.

Naïve Versus Skillful (Instructors)

Naïve Learner Characteristics

Non-specific goals

Self-handicapping strategies

Avoid self-evaluation

Attribute ability

Cannot adapt

Not interested

Skillful Learner Characteristics

Self-regulating

Set goals

High self-efficacy

Seek self-evaluation

Practice

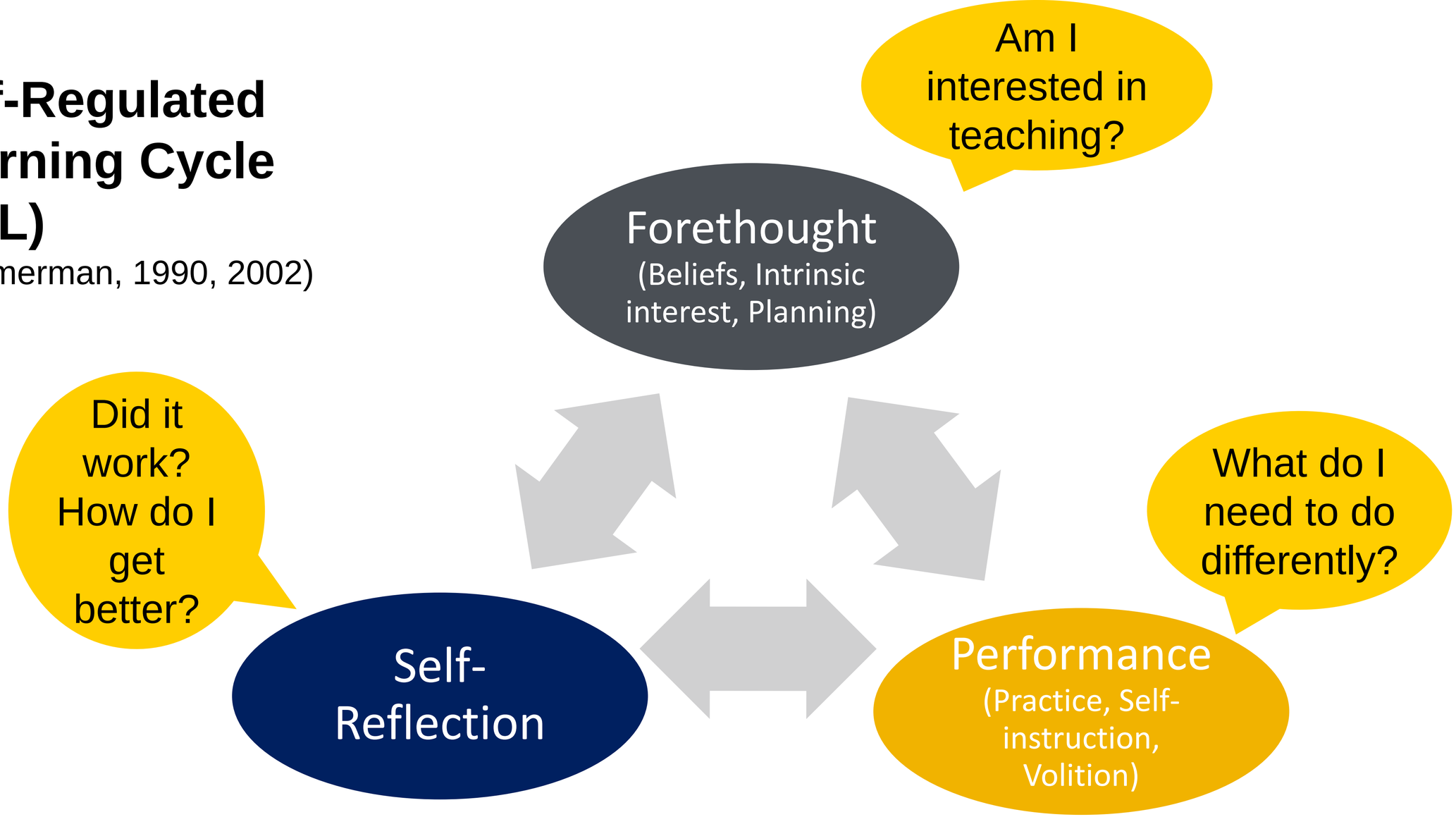
Can Adapt

Intrinsically interested

Zimmerman, 1990

Self-Regulated Learning Cycle (SRL)

-(Zimmerman, 1990, 2002)



Everyone is learning about something.
The same conditions will apply.

Great teaching may be equal parts belief (based on prior knowledge), practice and reflection (metacognition).

Implications for teaching

“What faculty do matters.”

John Hattie, 2009

Visible learning: A Synthesis of over 800 Meta-analyses Relating to Achievement.
New York: Routledge, 2009.

Faculty self-awareness matters.

“Actually my students have taught me that they are valuable. I admit I didn't always think that. They have said so many interesting things that have changed the way I teach. I had to change my way of thinking about them.” - Dr. Ji Son (Professor, Psychology, Cal State L.A.)

Dr. Son decreased her PSY 302 non-completion rates by 63.82% by redesigning her course for deeper learning using metacognitive strategies.

She studies metacognition in her own research.

Effective teaching is:

- **Its own area of practice, with adaptive and routine experts.**

- **A function of intrinsic motivation.**

Are you interested in teaching?

- **Demanding metacognition: reflection, monitoring and goal-setting.**

Are you willing to keep refining and practicing their teaching craft? To adjust a course to fit student needs?

- **Largely unrelated to research and scholarship in the discipline.**
  (Marsh et al, 1991, 1995, 1996)

Are you willing to become “novice learners” when thinking about your teaching?

- **Affective and largely discipline-neutral.**

Will you engage with sometimes uncomfortable training to reach your students where they are?

Why is mindful teaching so important now?

California is short one million baccalaureates.

First-generation students are THE college-going population.
Good teaching is a powerful motivator for first-generation and minority students.

70% of California community college students fail to graduate or transfer.

Most teaching has not adjusted to this reality.

- We cannot afford our current course non-completion rates.
- We must reach **all** faculty for all students to succeed.
- Improvements in teaching should be meaningfully tied to institutional rewards (tenure).

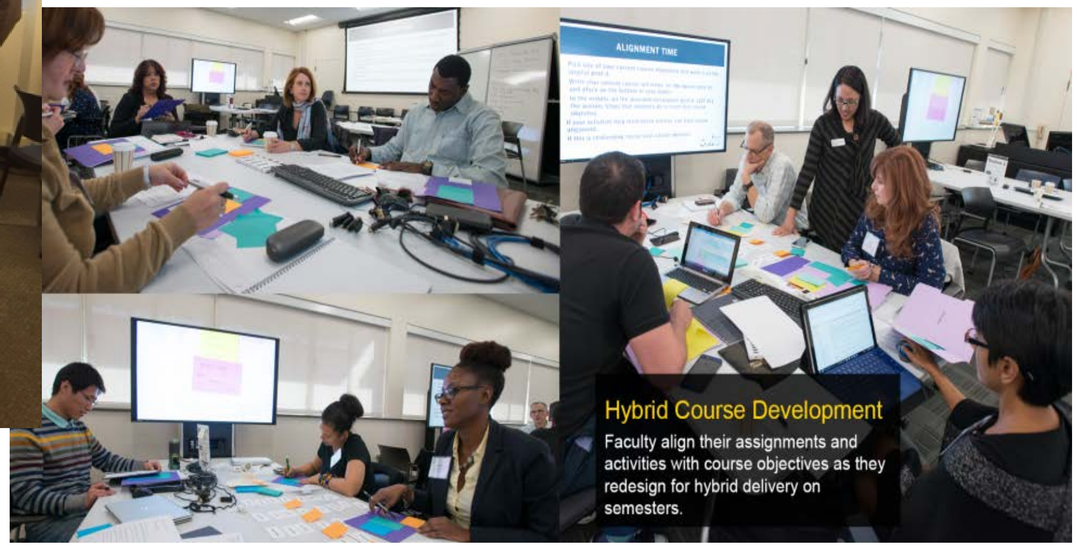
Some thoughts on scale (in Los Angeles)

- LA county is the world's 19th largest— and the poorest in the state.
- Strong middle-skill job (23%) opportunities in healthcare are hampered by a lack of collaboration in state governance and delivery structures.
- Collaboration between community colleges and WIBs require a regional focus.

Strengthening Los Angeles: Building a middle-skill workforce to sustain economic growth and expand opportunity. J.P. Morgan Chase, 2016.

Your hard work and participation at this conference matters.

So far 400 Cal State L.A. faculty have participated in a CETL intensive program (32-111 hours).



“Participants who amass a more extensive faculty development history …
show measurably larger changes in their teaching
than faculty whose participation is slight,
such as a single department workshop on the same topic."

- Condon *et al*, 2015

Faculty development and student learning: Assessing the connections. Indiana University Press, 2015.

“I am always ready to learn,
but I do not always like being taught.”

-Winston Churchill

Questions and comments

Evidence

There is no empirical basis for ‘learning styles’ --or left/right brain theory.

Gazzaniga, M. (2015). *Tales from both sides of the brain: A life in neuroscience*. Ecco.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest, 9,* 105–119.

Rogowsky, B. A., Calhoun, B. M., & Tallal, P. (2014). Matching learning style to instructional method: Effects on comprehension. *Journal of Educational Psychology, 107,* 64–78. doi://10.1037/a0037478

Evidence

Learning myths stubbornly persist.

Dekker, S., Lee, N.C., Howard-Jones, P. & Jones, J. (2012). Neuromyths in education: Prevalence and predictors of misconceptions among teachers. *Frontiers in Psychology, 3*:429- . doi: 10.3389/fpsyg.2012.00429

Deep learning is achieved through reflection as opposed to experience alone.

Ash, S.L., & Clayton, P. H. (2009). Generating, deepening, and documenting learning: The power of critical reflection in applied learning. *Journal of Applied Learning in Higher Education, 1*, 25-48.

Evidence

Give an in-class activity before you have them do the reading.
Schneider, B., Wallace, J., Blikstein, P., & Pea, R. (2013). Preparing for future learning with a tangible user interface: The case of neuroscience. *IEEE Transactions on Learning Technologies*, 6,117-129. doi:10.1109/TLT.2013.15

Mix up your practice.
Brown, C.B., Roediger, H. L., & McDaniel, M.A. (2014). *Make it stick: The science of successful learning*. Cambridge, MA: Harvard Belknap.

Evidence

Faculty who participate in their own professional development improve their students' success.

Condon, W., Iverson, E.R., Manduca, C.A., Rutz, C., & Willett, G. (2016). *Faculty development and student learning: Assessing the connections*. Bloomington, IN: Indiana University Press.

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CALIFORNIA STATE UNIVERSITY, LOS ANGELES

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