


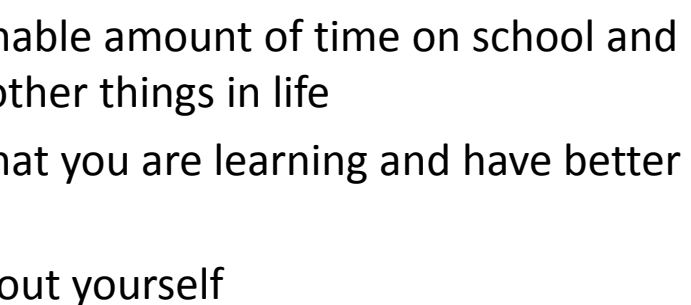


A Research Approach to Learning

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Chemistry & Skylight
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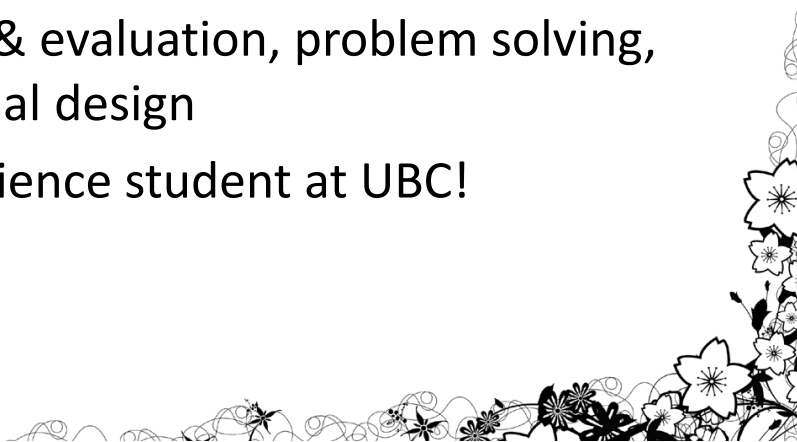


Objectives

- ✱ By the end of this session, you will be ready to implement a plan to improve your approach to learning
 - ✱ This can help you
 - Do well on exams and earn better grades
 - Spend a reasonable amount of time on school and have time for other things in life
 - Understand what you are learning and have better retention
 - Learn more about yourself
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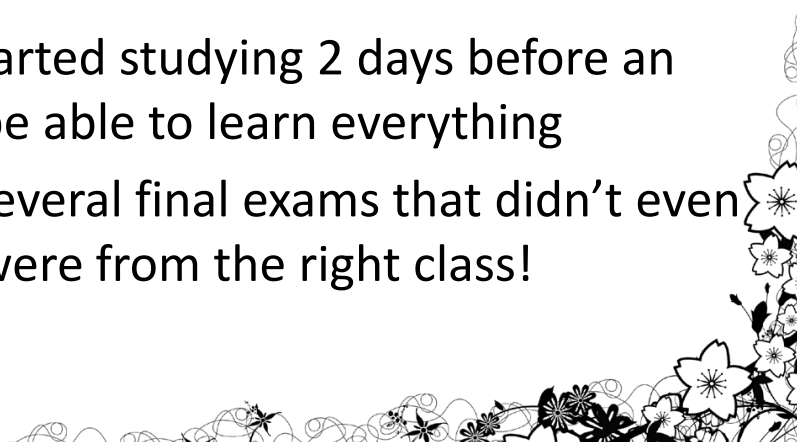
A little about me...

- * I have taught
 - ~2000 students CHEM 233
 - ~1200 students test preparation MCAT, GRE, PCAT, DAT
 - Hundreds of students as a TA/tutor
- * Current research interests include education measurement & evaluation, problem solving, and instructional design
- * I was once a science student at UBC!



Me as an undergraduate

- * I loved chemistry, but I didn't love ALL my classes
- * I studied mostly by reading my notes and doing practice problems
- * I thought that my instructors couldn't see me sleeping in the middle of the lecture hall
- * I thought if I started studying 2 days before an exam I would be able to learn everything
- * I sat down to several final exams that didn't even look like they were from the right class!



Questions for you!

- * Do you have trouble figuring out what is expected of you in university courses?
- * Do you have clear goals for what you want to accomplish each study session?



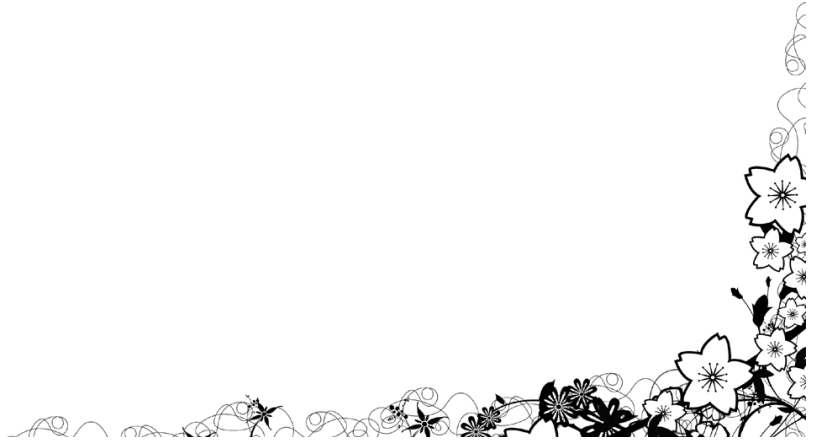
What is an effective student?

- * One who is able to “accurately assess what they have learned and can then implement effective control processes to acquire the material not yet learned”



Learning involves organizing information

- * Experts in a discipline have a well-organized knowledge “structure”
 - In science, this is usually a network of inter-related concepts and fundamental principles
 - How your knowledge is organized impacts how you can use it



Expert – novice differences

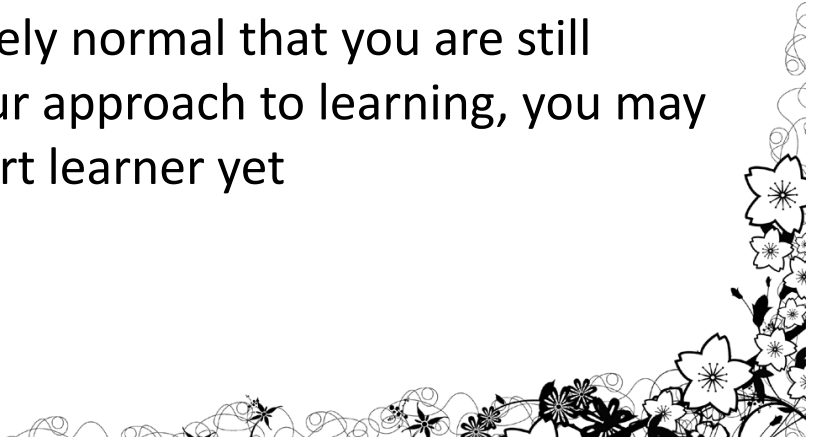
- * Experts determine the concepts that underlie a problem, then apply appropriate strategies to solve it
- * Novices attempt to apply a “formula” or “reaction” without understanding how this relates to the concepts involved



Are you an expert learner?

- * It is estimated that ~ 10,000 hours is needed to develop *expertise in a discipline*
- * By the age of 18, students have spent ~5,000 hours “on task” in school and doing homework (i.e. learning)
- * Thus, it is entirely normal that you are still working on your approach to learning, you may not be an expert learner yet

Rosenshine (1979)



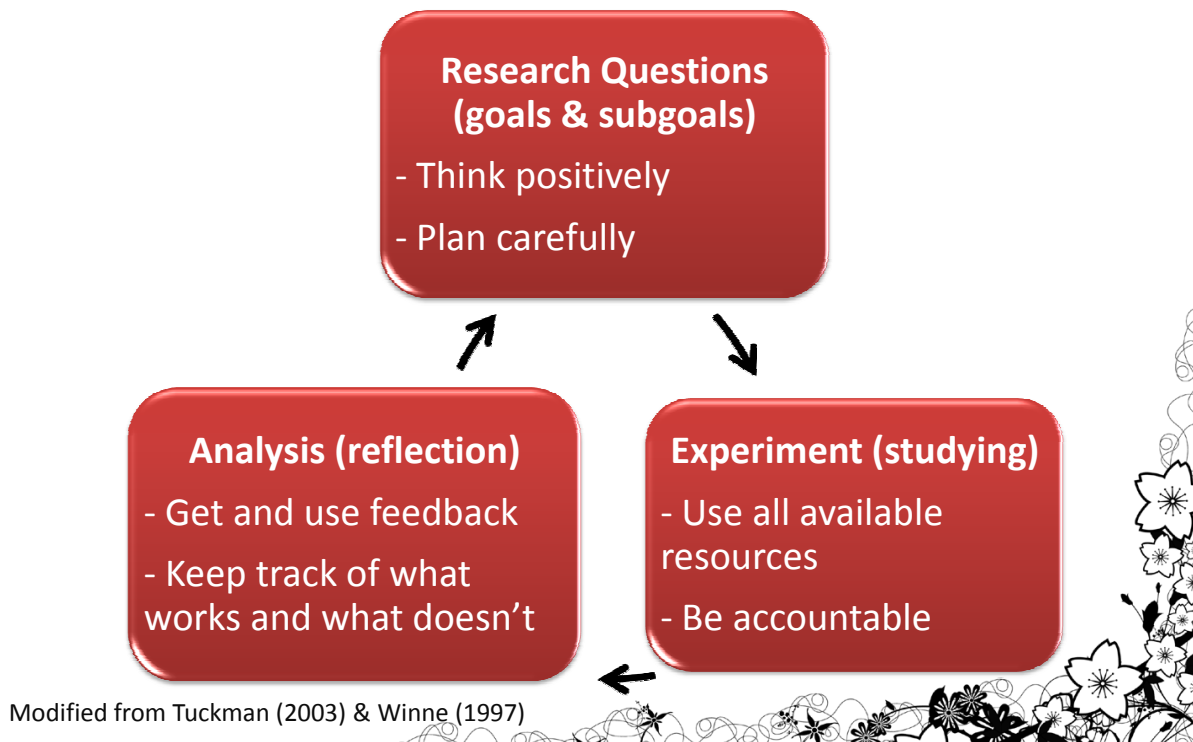
A research approach

- * What if...
 - You approached studying like a researcher
 - You are both the experimenter and subject!
 - You set hypotheses and test these hypotheses to learn more about yourself

Winne (1997)



Learning as research



Challenges

- * Obtaining sufficient practice and feedback
 - Other forms of feedback besides one-on-one
 - Textbook solutions, problem set solutions, friends, comments on exams and homework, online systems, instructor office hours
- * Remembering what approach you used
 - Keep careful notes – your “lab book”
- * Deciding if an approach was successful or not
 - Comes with experience

What do you think of these goals?

“To attain a final grade of B or higher in this course, because I want to get into the Microbiology and Immunology department”

“Not to fail this course”

“To study really hard”

(they are outcome-oriented and general)

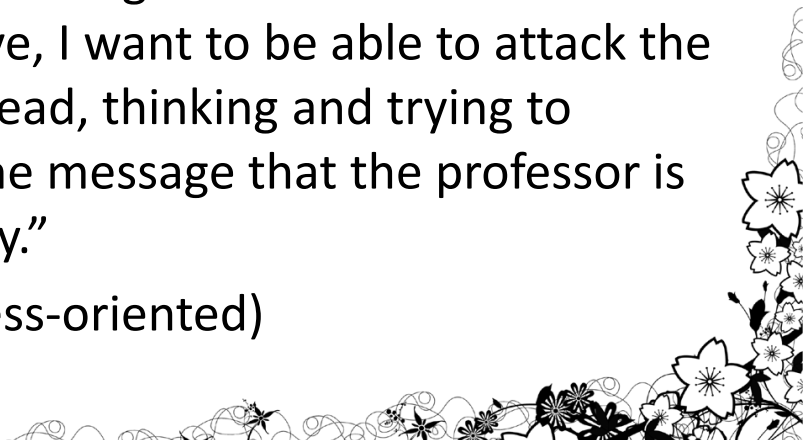


What do you think of these goals?

“To read the material ahead of time, review after classes and to work on as much as study questions that are available for me to try.”

“Rather than allowing lectures to become mentally passive, I want to be able to attack the lecture in my head, thinking and trying to comprehend the message that the professor is trying to convey.”


(they are process-oriented)



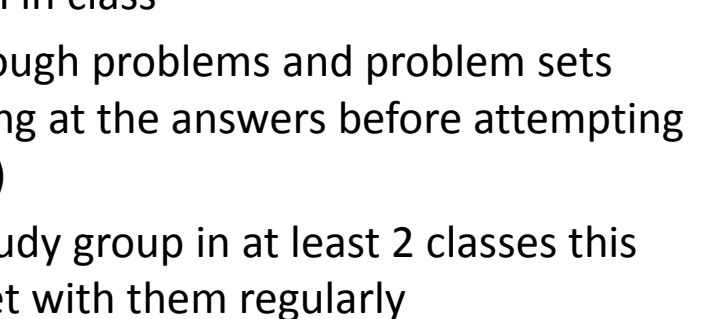
Goal-setting

- * Students who set effective goals tend to perform better
- * **S**pecific
- * **M**easureable
- * **A**ttainable (yet challenging)
- * **R**ealistic (incremental)
- * **T**ime-specific

Locke & Latham (2002); Schwartz & Gredler (1998)



Example process/learning goals

- * What are you going to **DO**?
 - I will spend 5 minutes after each class reviewing my notes to ensure they are organized in a meaningful way
 - I will think of 2 questions during each class, even if I don't ask them in class
 - I will work through problems and problem sets (without looking at the answers before attempting the problems!)
 - I will form a study group in at least 2 classes this term, and meet with them regularly
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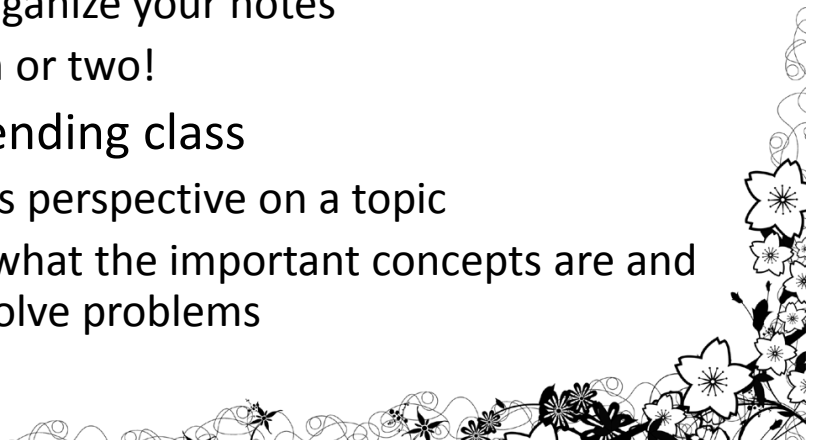
Before class

- * Studies have shown that students benefit from being “primed” for learning
- * Not all instructors give pre-lecture quizzes, but many give readings or post notes before class
 - For classes that you are lost in, try pre-reading



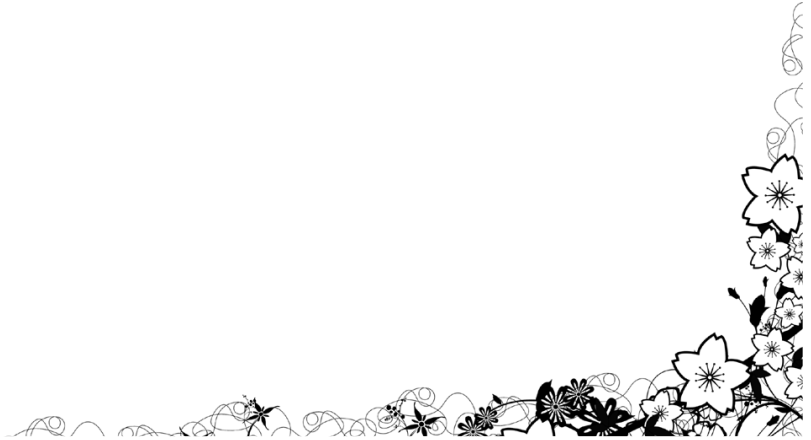
During class

- * When asked to participate – do it! Research shows that the more cognitively active you are, the better you learn!
- * You can make straight lectures more active
 - Ask yourself questions and write them down for later
 - Consciously organize your notes
 - Ask a question or two!
- * Benefits of attending class
 - Get an expert’s perspective on a topic
 - Gain cues for what the important concepts are and how experts solve problems



After class

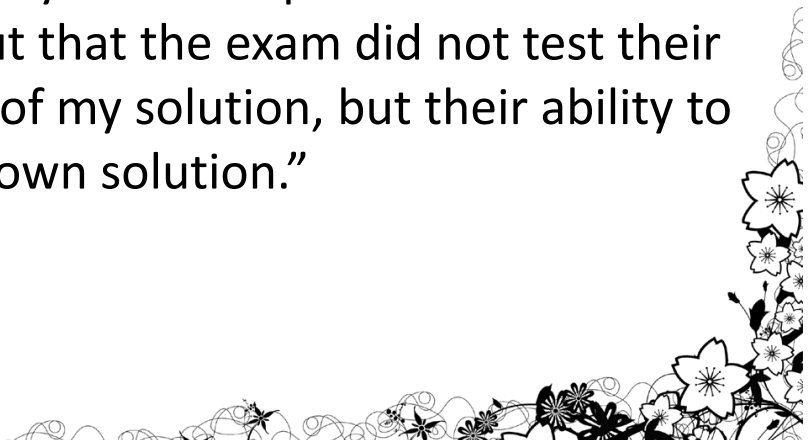
- * Approaches to homework problems and general studying
- * Approaches to exam preparation & doing practice problems



Exam preparation

- * From an instructor...

“...a failing student would express dismay since s/he had understood the way to solve the problem perfectly when I explained it in class. I had to point out that the exam did not test their understanding of my solution, but their ability to generate their own solution.”



Deliberate practice

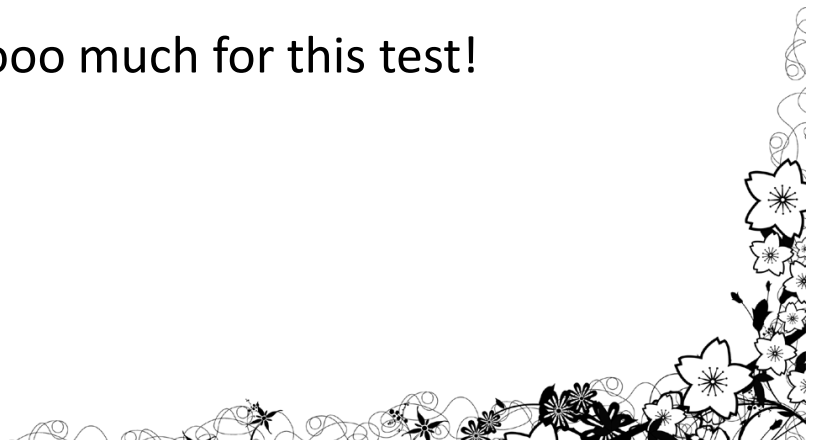
- * Study without distraction
- * Study with a goal in mind – to learn/improve “X”
- * Studying should feel challenging, work on problems outside your comfort zone
- * Use feedback to make adjustments in how you approach problems
- * Repeat

Colvin (2006)



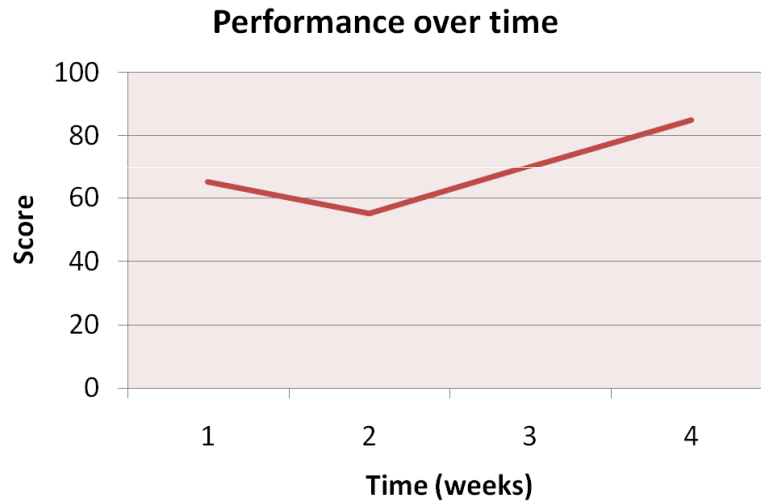
I sometimes hear from students...

- * Using new study strategies takes a lot of effort, and what if they don't work?!
- * The material just isn't relevant or interesting to me!
- * But I understood the material!
- * I studied soooooo much for this test!



Utilization deficiency

- * Performance often decreases when you try a new tactic



Miller & Seier (1994)

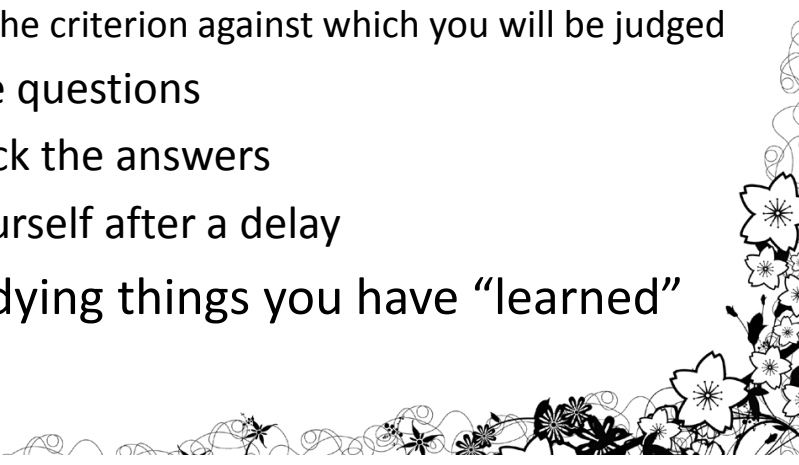
Not interested?

- * What to do when a task is not intrinsically valuable (interesting)?

Judgments of learning

- ✱ You can trick yourself into thinking you know more than you do
 - Find out what is expected of you
 - Understand the types of tasks you will be asked to do
 - Understand the criterion against which you will be judged
 - Overtly do the questions
 - Diligently check the answers
 - Try testing yourself after a delay
- ✱ Don't stop studying things you have “learned”

Dunlosky & Lipko (2007)
Plant, Ericsson, Hill & Asberg (2005)



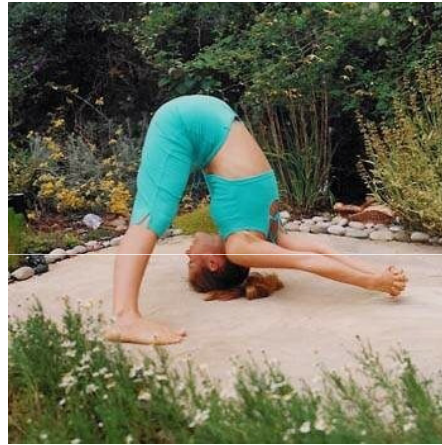
Time spend studying

- ✱ Only relates to performance when the quality of study and previous experience is the same
- ✱ The right study methods can make you a more efficient learner!

Plant, Ericsson, Hill & Asberg (2005)



What's stopping you?



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You are smart enough!

- * UBC has great students
- * It's not your ability that is holding you back



Dweck & Leggett (1988)

Make the most of this day!

- * The literature suggests that the best way to learn study strategies is “in context”
- * Study tactics have high cognitive load, so you need to practice them to make them work well for you
- * Although study attitudes may improve, you need to work hard to make sure that these attitudes translate into better performance
- * Approach learning as research!

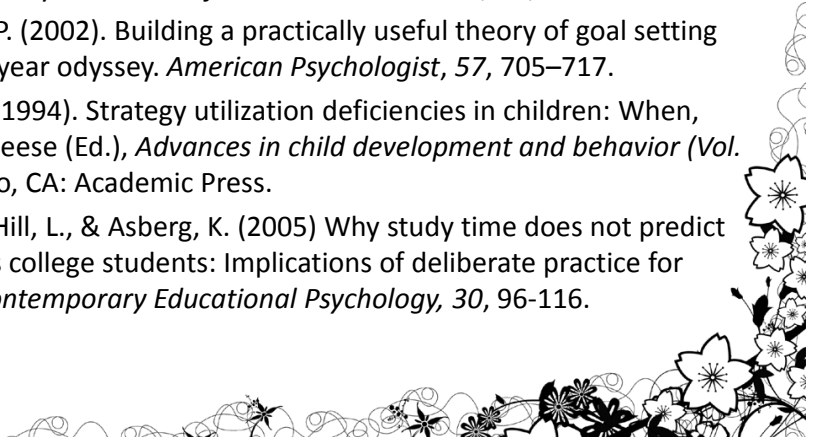
Hattie, Biggs & Purdie (1996)

Thank you and good luck!



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