Using Bloom's Taxonomy for improving student learning outcomes in Econ 201

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Presentation for Scholarship of Excellence in Teaching

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Problem faced and Goals set

- **Problem:**
  Econ201 is an introductory 200-level economics course. But students do not know how to
  a. take charge of their learning,
  b. handle higher-level thinking skills.

  They may be able to learn definitions but are unable to apply, analyze, or synthesize knowledge which requires students to devote adequate time to studying, reflection, and focusing on higher-order thinking.

- **Result:** Low grades such as Ds and Fs

- **Goals:**
Increase student metacognition,

- *make students focus on the higher-level thinking skills based on Bloom's taxonomy to promote deeper learning,*

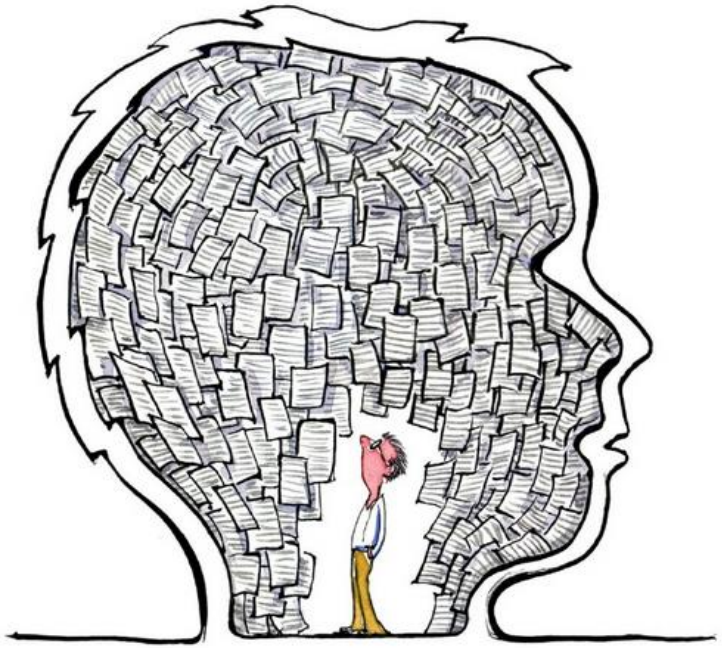
- *and get a larger number of students in class more engaged with learning.*

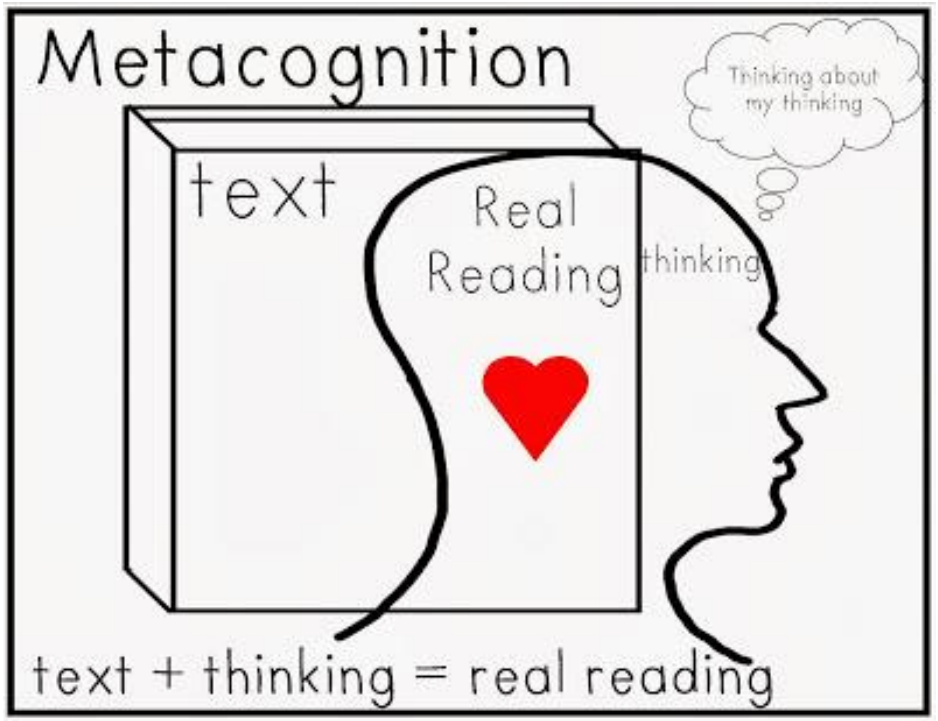
- *Improve final grade and attitude towards learning.*

Inspiration

- My inspiration came from the book *"Teach Students How to Learn" by Sandra Yancy Mc Guire*
- A quote from the book

"But by focusing exclusively on teaching and ignoring how we can help students figure out their role in the learning process, we are leaving out half the equation.
I used to think that if faculty teaching improved, student learning had to follow suit. But now it seems to me that even if we are the best teachers on the planet, as long as students do not come to our classrooms prepared to learn efficiently and independently, we will never see the kind of learning gains that are possible"



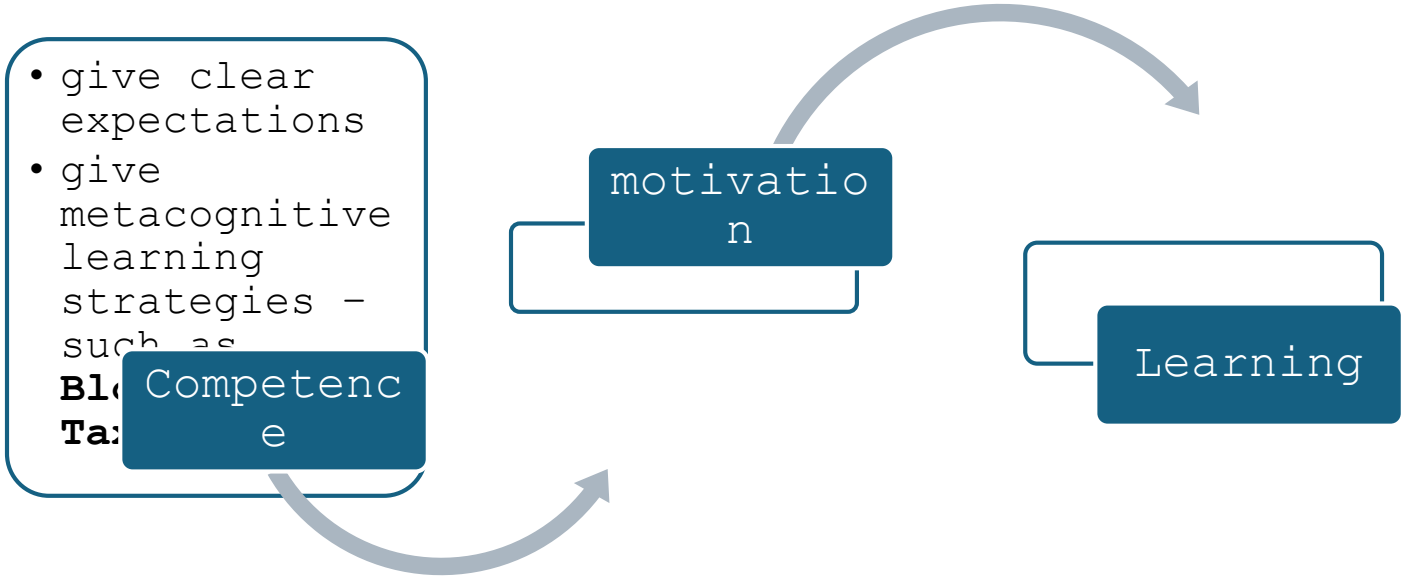


An important word - Metacognition

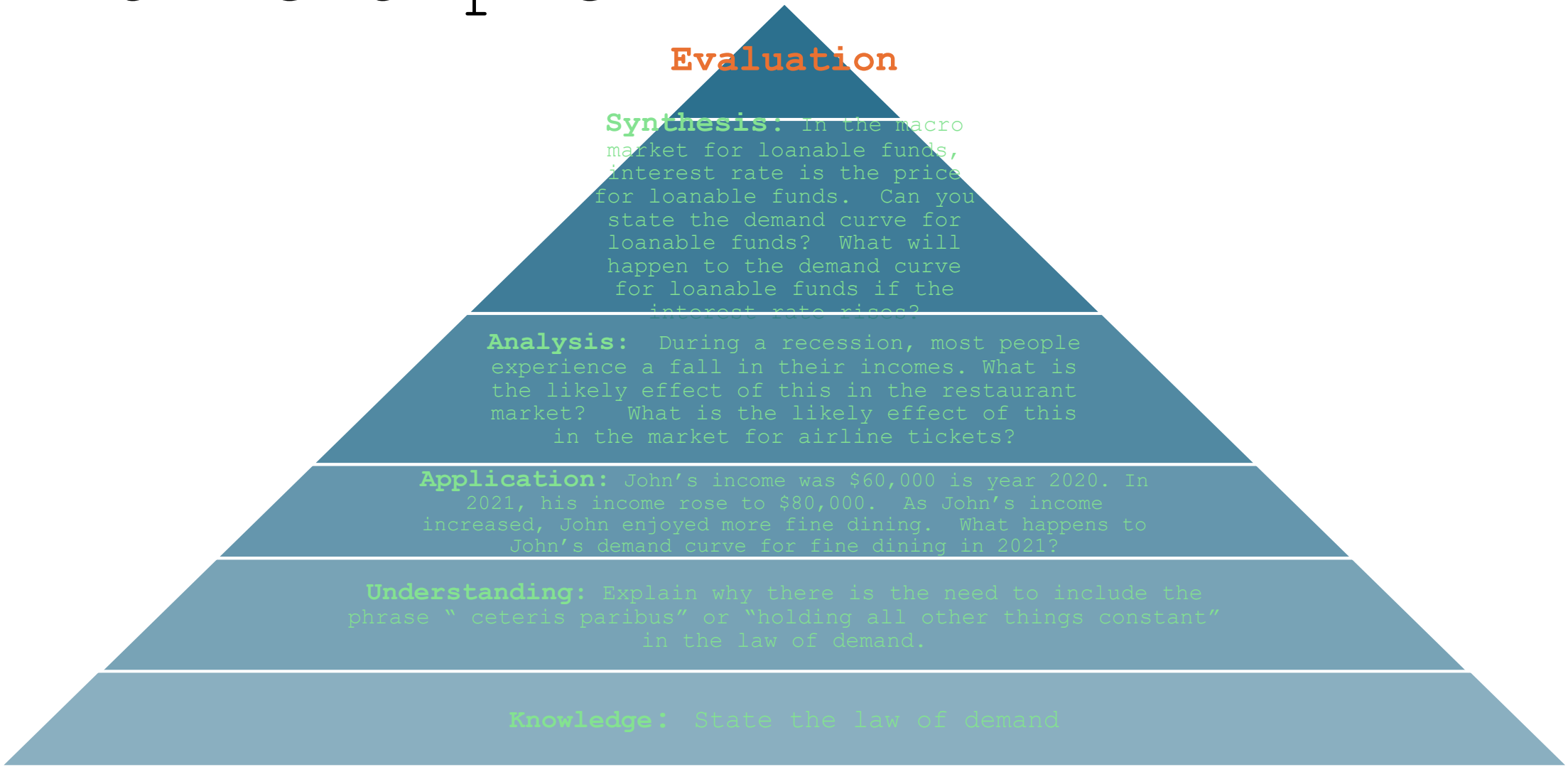
- "thinking about thinking"
- Ability to understand and control our thinking process

Why Bloom's Taxonomy?

- McGuire emphasizes that student motivation is important for learning.
- According to Mcguire, **one of the factors that can foster motivation is student competence.** The more competent a student becomes, the more motivated is the student in his/her learning.
- Faculty can increase competence by giving students **clear expectations** about the course and some tools of metacognitive learning. **Bloom's Taxonomy** is one such tool.



Application of BT in Economics – an example



Strategy

- Introduce students to the pyramid of Bloom’s taxonomy (BT)
- Encourage students to think about BT while learning - while reading the text or solving problem sets.
- After classwork and or after an exam engage students to reflect on questions - identify the area of BT in which this the question belongs, ask students to think why they answered the question wrongly.
- survey students on their learning habits.

Implementation

- Students were introduced to Bloom's taxonomy in the syllabus
- Students were informed that exam questions will involve higher levels skills in the taxonomy.
  - Very few questions will be from "Knowledge". Other questions will be from "Analysis" or "Application" area in which case the student has to master all levels below Analysis or Application.
- Students were instructed to reflect on BT while reading the text.
  - Think deeply as you read – try not only to know concepts and definitions but also to get the meanings of concepts. Ask yourself at every step what does this mean? What new result can this lead to? How is this connected to what I learned earlier? Economics is like an onion. Peel all the layers in the onion.

First exercise

- Week 3 - On Tuesday, September 17, students received a problem set to complete in class. My goal was to teach students how to learn.

- There were 3 questions based on Marginal analysis. Data on marginal benefit (MB) was given in a table. However, marginal cost (MC) was NOT given in the table format but was given inside the language of the question.

- The students had to do the following tasks:

1. Students had to find the marginal cost (MC) of the 3rd unit of pizza
2. Students had to find the optimal point

The problem set

- Students found the exercise difficult
- They also found it difficult to draw the graph or label the axis.

Use the following table to answer the next two questions. The following table gives the marginal benefit (in term of $) of eating a slice of Pizza and cost per slice of pizza is $1.50.

Slice of Pizza	Marginal benefit from a slice
1	$4.00
2	$3.00
3	$2.00
4	$1.5
5	$0.25

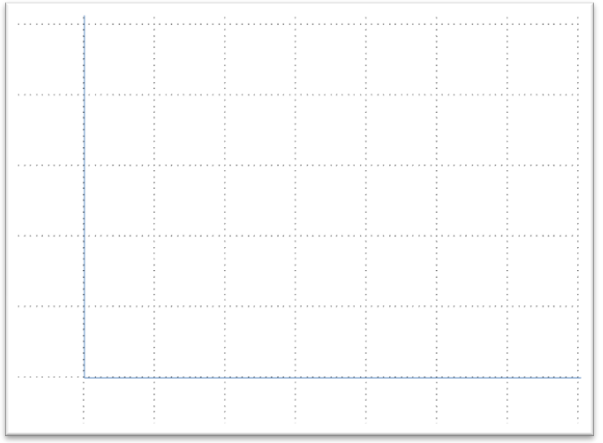
1. What is the marginal cost of the third slice of Pizza?

A. $4.50
B. $ 2.00
C. $1.50
D. impossible to determine from the given information

2. What is the amount of slices that this consumer will eat to maximize his happiness?

A. only 1 slice
B. 2 slices
C. 3 slices
D. 4 slices
E. 5 slices

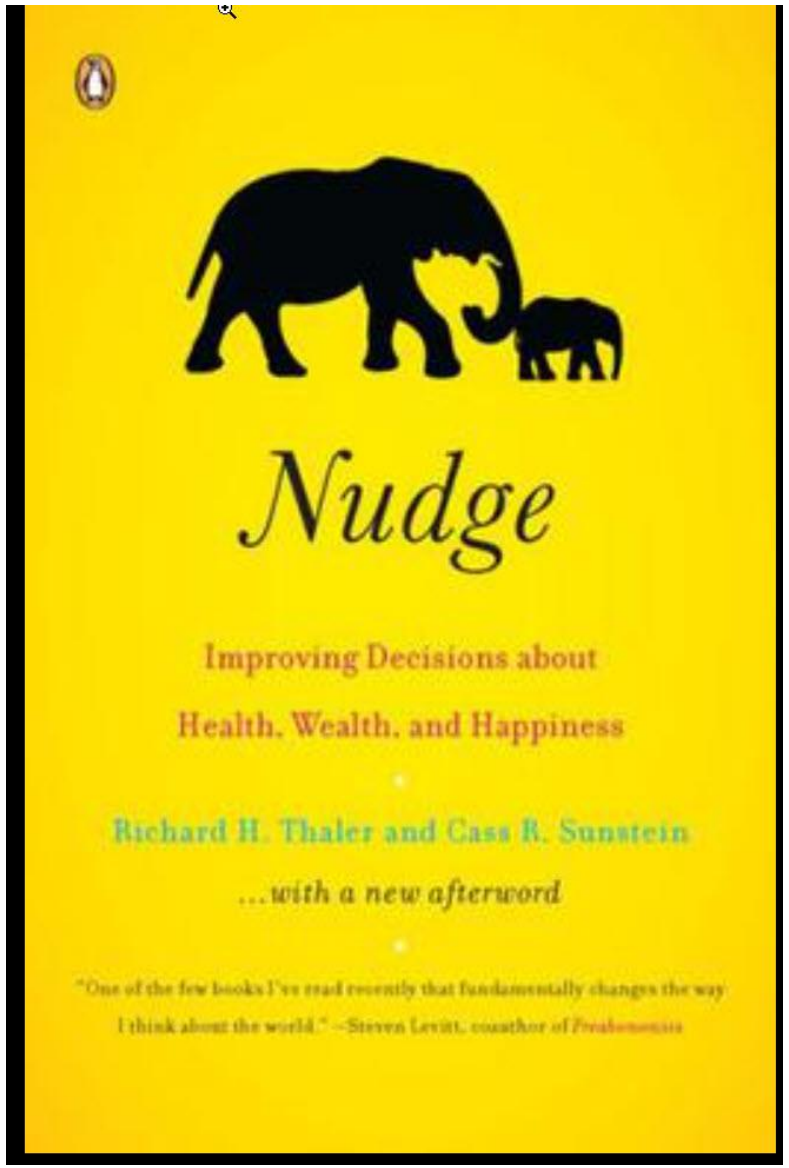
3. Draw the MC and MB curves for the above table.



Students learned some lessons from the exercise

to just learn definitions. In a 200-level class students must master the material deeply.

2. Again, students were re-informed that exam questions will mostly come from higher parts of the BT pyramid.
3. Students' ability in application of concepts will improve if they listen to the video at the beginning of each chapter in the textbook and figure out how it relates to the concepts in the chapter. They also need to solve similar problems from text book (Mylab). Only through practice, they will acquire the type of thinking skill that will enable them to solve these problem sets.
4. At the end of the class most students felt that they had a good lesson that day. One student came up to me and thanked me for the lesson and that she now has a better understanding of the expectations of the course and how to approach her learning!



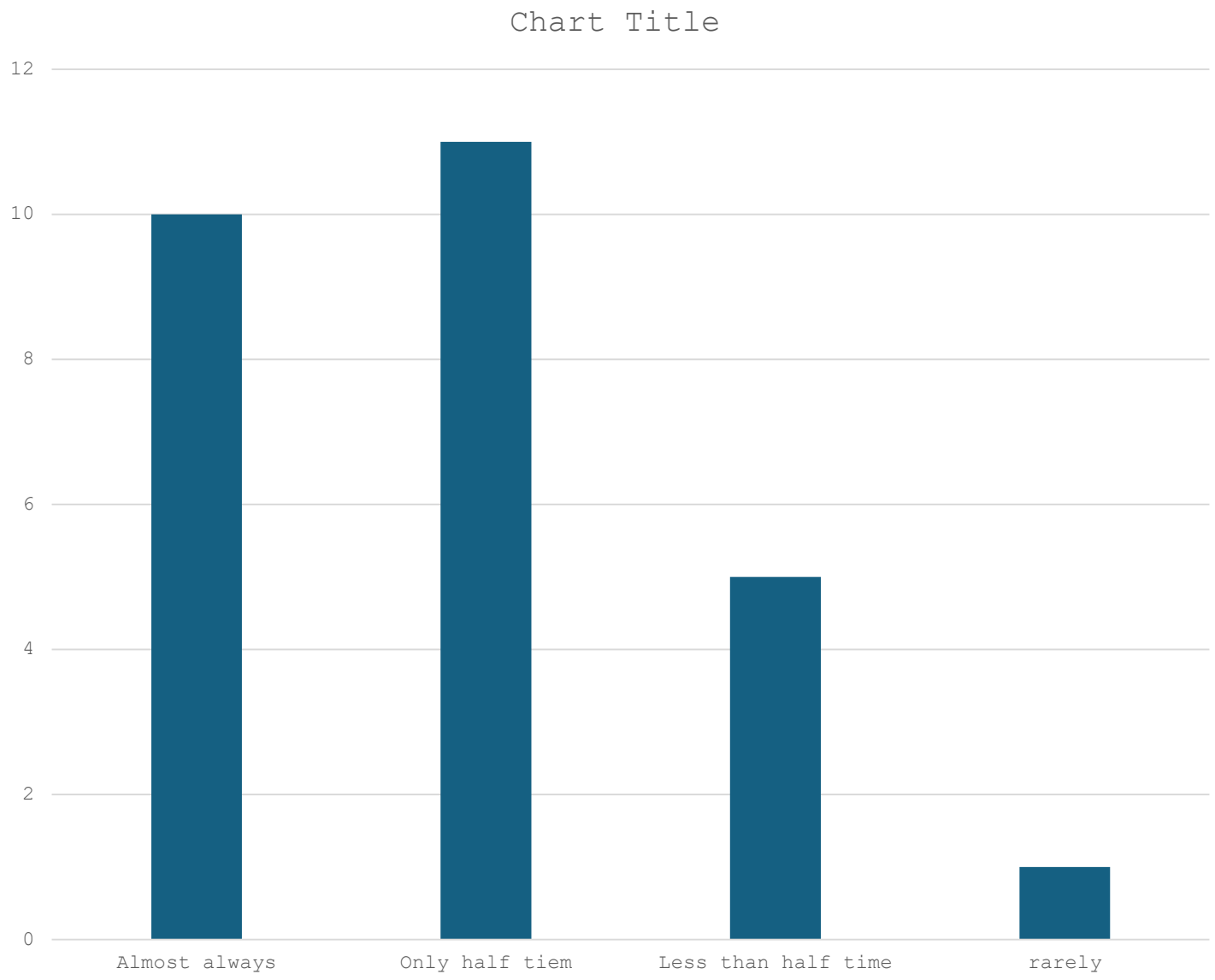
Nudge factor: Survey on study habit

- In addition, I conducted a survey to nudge students to think about their study habits, attentiveness, attitude towards learning
- A “nudge” can make students act on certain actions which they may be postponing or ignoring
- I wanted to gauge their “motivation level” with this nudge.
- I drew inspiration from Nobel Laureate Richard Thaler’s book, Nudge.

factor: Study habits of students

- 2 surveys given
- Survey 1
- Question 2:

How often did you feel excited about your lessons in the last 3 weeks (6 classes)?
1. Almost always
2. Only half the time or a bit more
3. Less than half the time
4 rarely



Nudge factor: reflect on graphs and ideas

Sky and Water(1938) - Escher

Still life and Street (1937) - Escher

Midterm Grades Comparison

Midterm Grades in Spring 2024

- # students taking Midterm = 22
- Exam 1 + 2 HW, Total points = 60
- Exam 1 has 22 questions with 4 extra credit points

A=2 students		9%
B=4 students		18%
C=4 students		18%
D=3		13%
F=9		40%
		D+F=54%

Midterm Grades in Fall 2024

- # students taking Midterm = 28
- Exam 1+ 2 HW = Total points = 60
- Exam 1 has 22 questions with 4 extra credit points

A=3 students	10%	
B=7	25%	
C=7	25%	
D=6	21%	
F=5	17%	
	D+F=39%	

Question identification after Midterm Exam based on Bloom's Taxonomy

- 1 – FORM A – MACRO Econ201 crn20124
- Total of 22 Questions
- Students mapped the six most missed questions into areas of Bloom's Taxonomy

Question # 3 Application	Question # 11 Understanding	Question 14 Knowledge, Understanding
Question #16 Understanding, Application	Question #18 Synthesis	Question#20 Application

Final Grades Comparison

Final Grades in Spring 2024

- # students taking Final = _20_____
- Total points = 160
- Total extra credit in the course=21 points

A= 1 student	5%
B= 5 students	25%
C = 6 students	30%
D = 3students	15%
F =5 students	25%
	D+F = 40%

Final Grades in Fall 2024

- # students taking Final = __27_____
- Total points 160
- Total extra credit in the course =25 points

A= 3 students	11%
B =9 students	33%
C= 7	26%
D=5	18%
F=3	11%
	D+F =29%

Reflection

What did you learn about your teaching?

- I think it is important for us to teach students metacognition. I will focus on this again in the coming semesters.
- I think with the AI revolution affecting our world, taking charge of their own learning, understanding higher level thinking skills and a having a grasp over their metacognition are going

What did you learn about your students?

- Understanding BT helped some students understand the expectations of the course and hence motivated them to do well.
- Some students who do not come to the class or do not complete multiple assignments, do not benefit from this knowledge

Thank you!

Many thanks and appreciation

to Joan for her hard work, wonderful guidance, unwavering support and ever-present kindness.

And to my cohort colleagues for all their sharings, insightful comments, and warm collegiality!!