Teaching Statistics using real-Time Hands-on Activities

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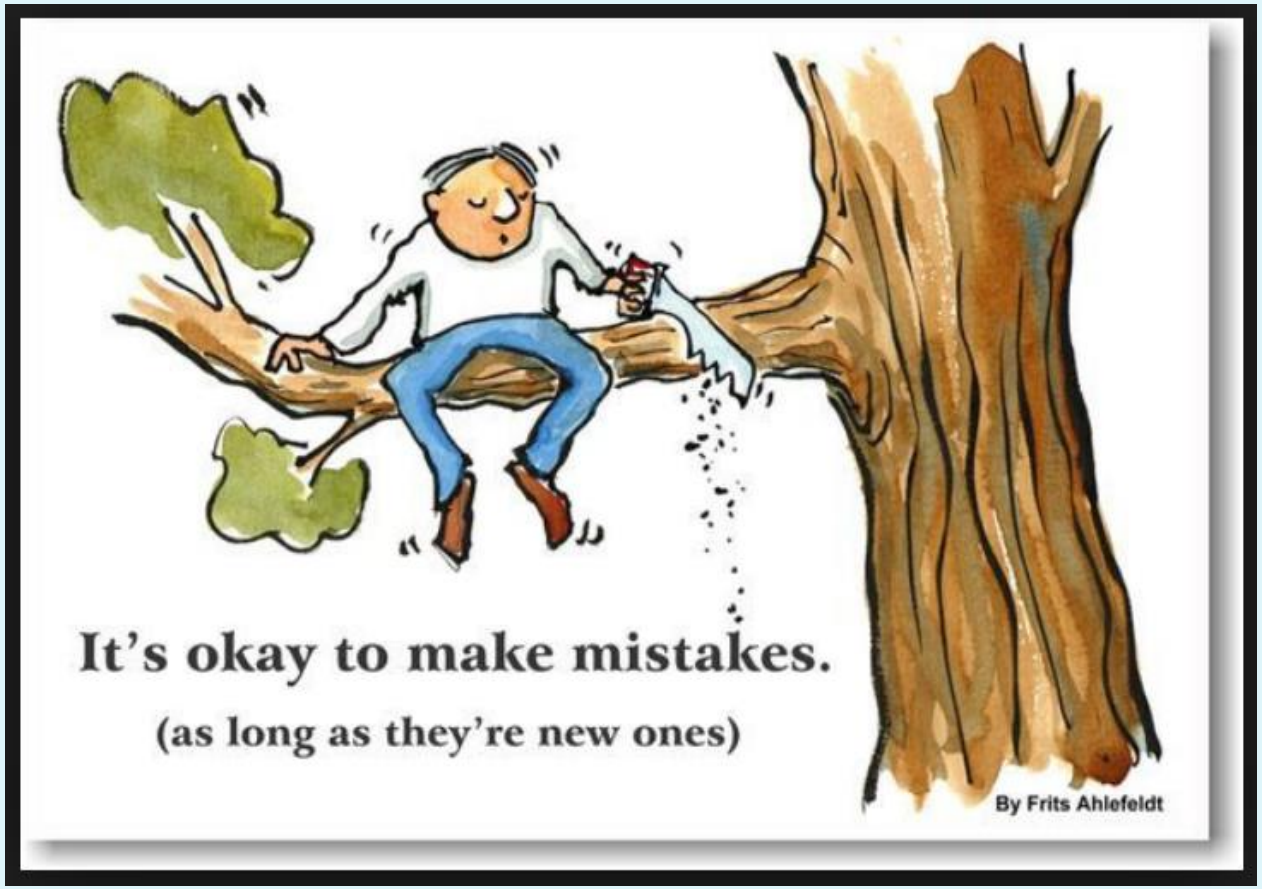
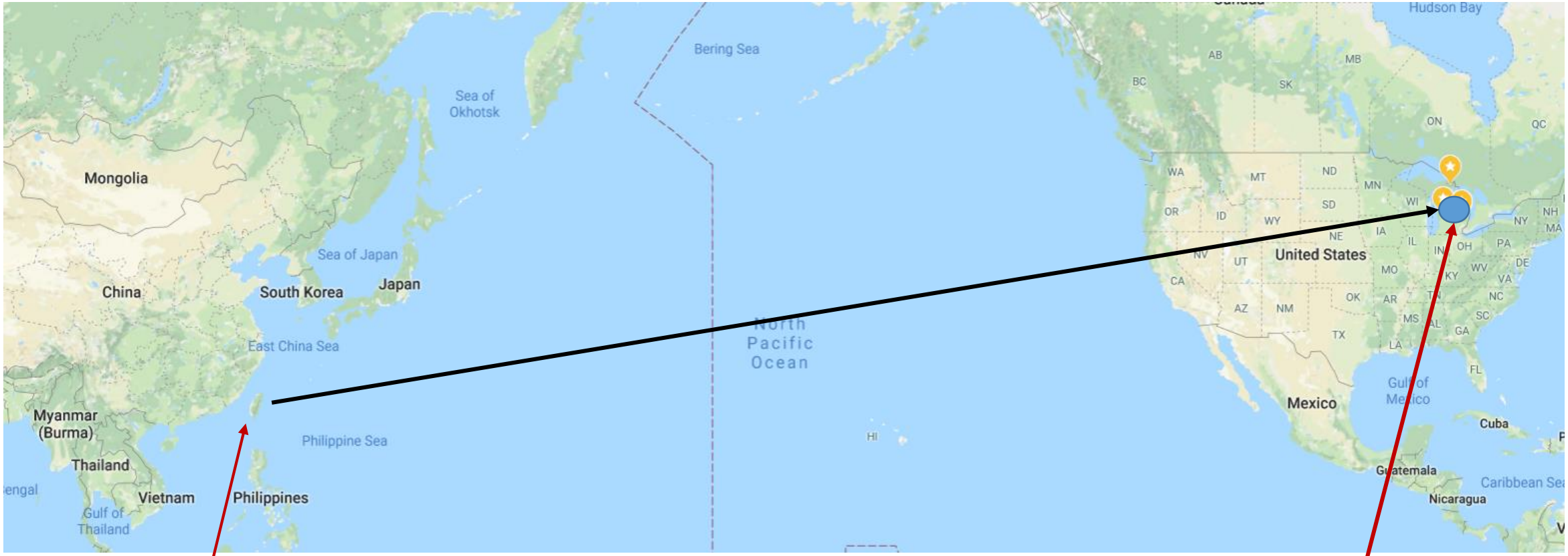
Teaching is to give people HOPE

Learning is by Doing

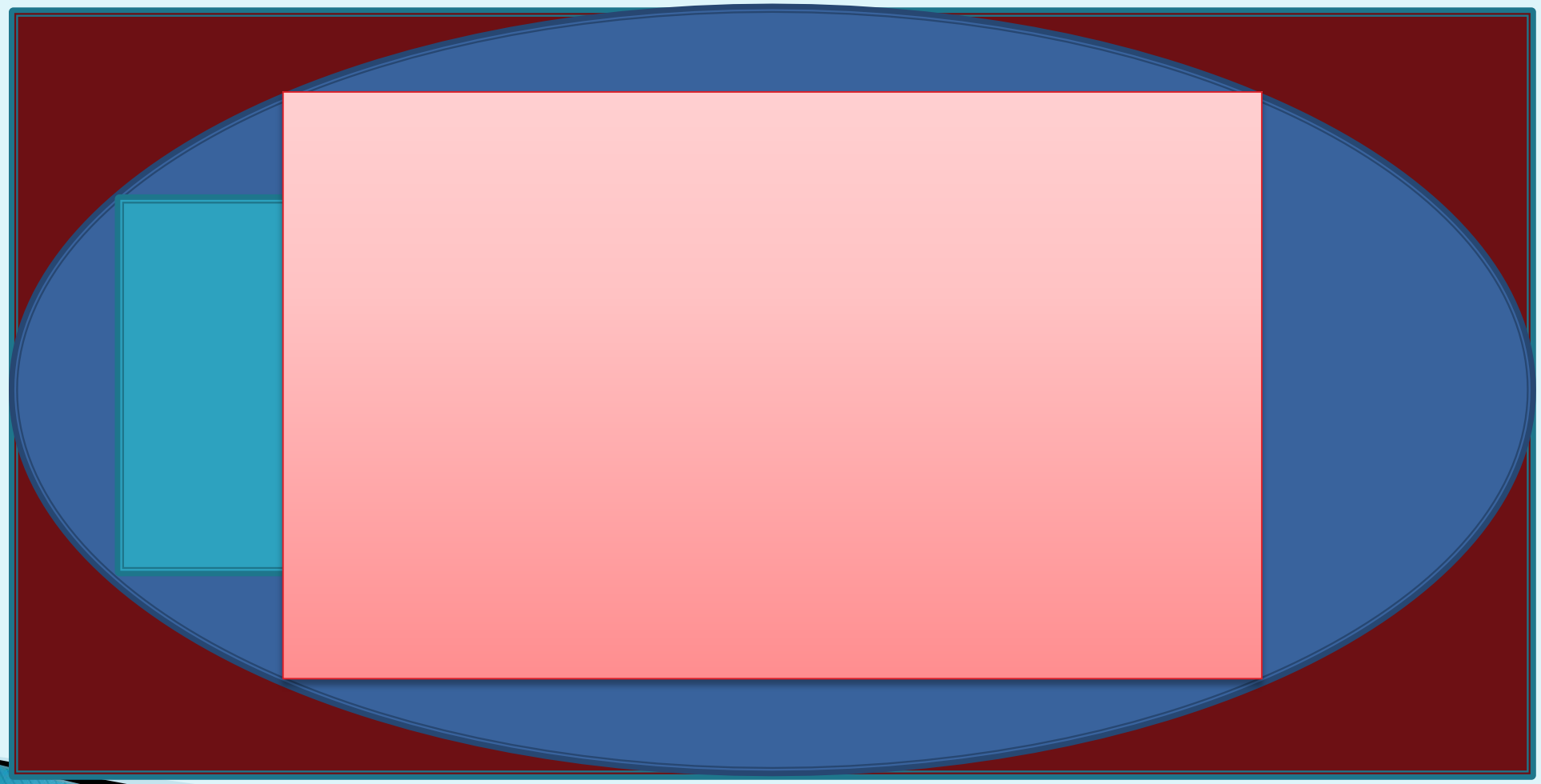




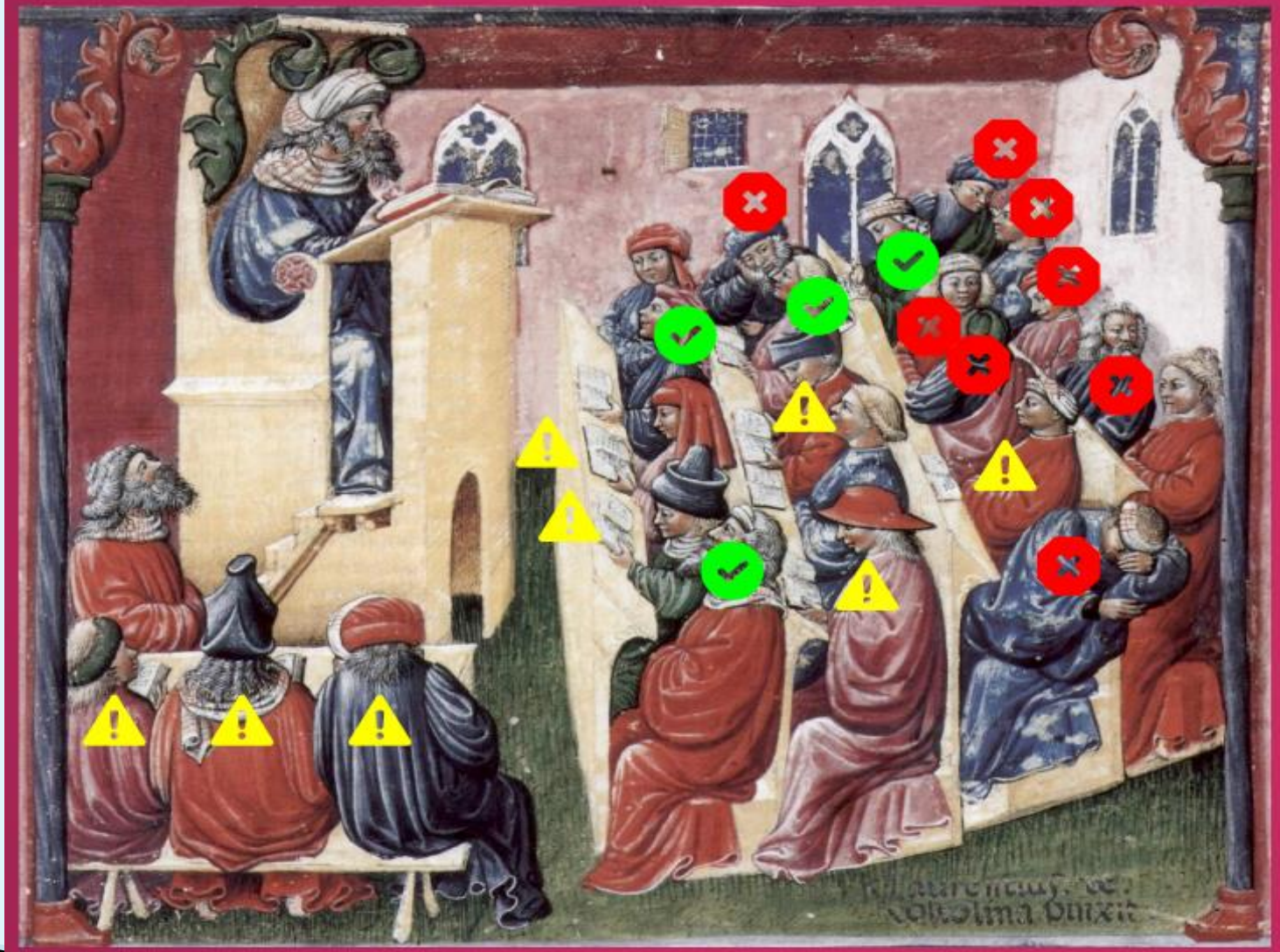
Taiwan

Central Michigan University
Mt. Pleasant, MI

Does Teaching ⟹ Learning ?



LECTURES THEN AND NOW



Painting by Laurentius de Voltolina of Henry of Germany delivering a lecture to university students in Bologna in the 14th century (Reference)

Paying attention

Taking notes

Talking during the lecture

Distracted; falling asleep

Asleep!

Reading on their own

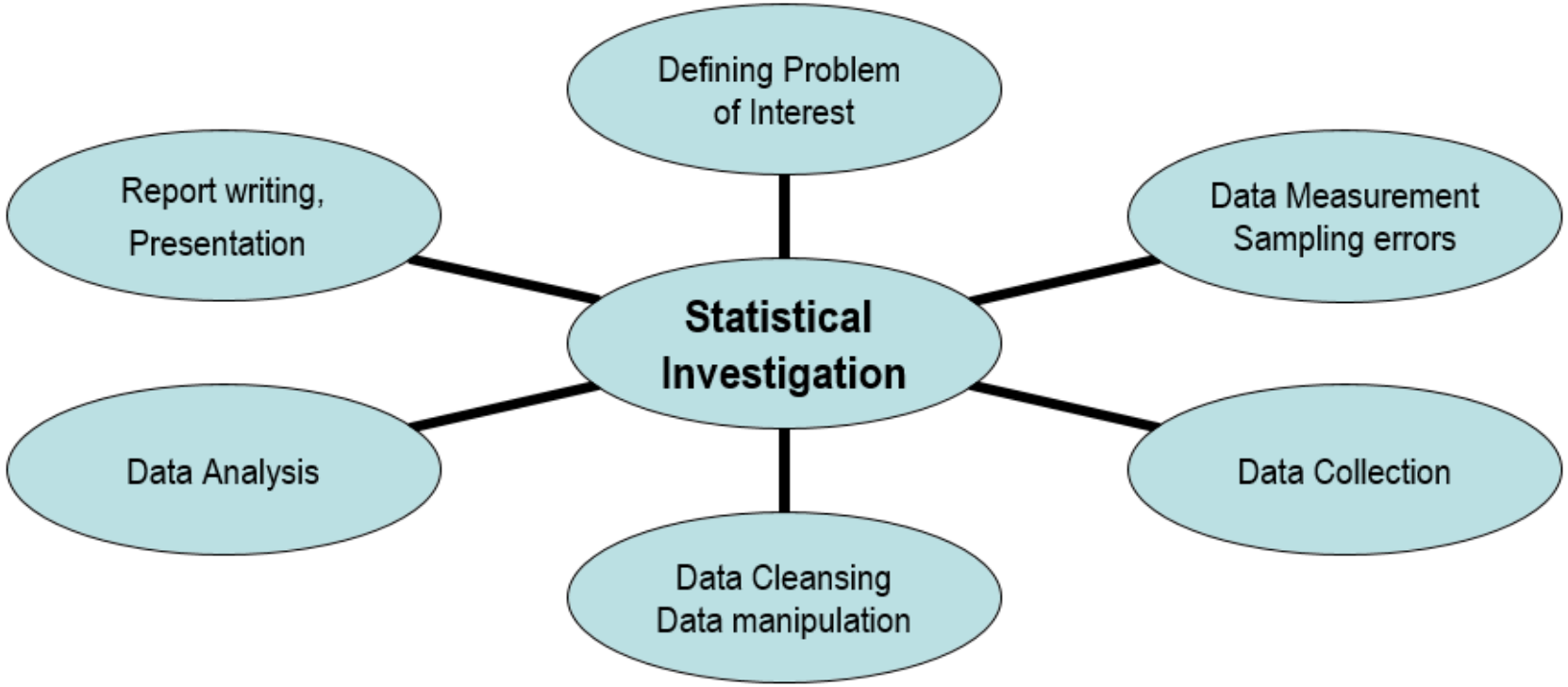
Like Ducks in the Thunder!

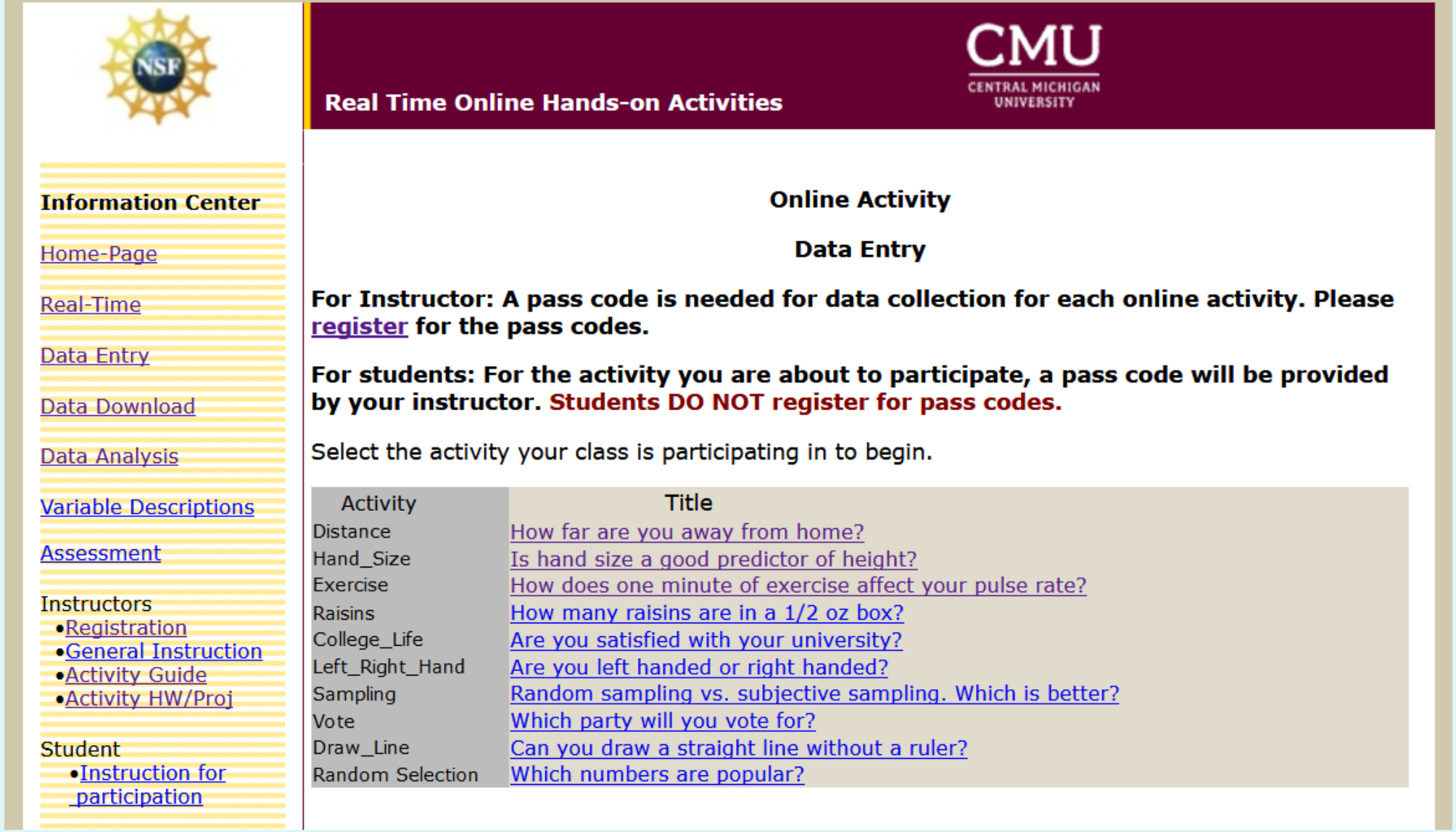
I hear and I forget.
I see and I remember.
I do and I understand.

Confucius 551-479 BC

Why Real-time data Generated by Students?

This makes it possible to conduct the entire process of statistical investigation in an introductory statistics course.





Real Time Online Hands-on Activities

CMU CENTRAL MICHIGAN UNIVERSITY

Information Center

Home-Page

Real-Time

Data Entry

Data Download

Data Analysis

Variable Descriptions

Assessment

Instructors
- Registration
- General Instruction
- Activity Guide
- Activity HW/Proj

Student
- Instruction for participation

Online Activity

Data Entry

For Instructor: A pass code is needed for data collection for each online activity. Please register for the pass codes.

For students: For the activity you are about to participate, a pass code will be provided by your instructor. Students DO NOT register for pass codes.

Select the activity your class is participating in to begin.

Activity	Title
Distance	How far are you away from home?
Hand_Size	Is hand size a good predictor of height?
Exercise	How does one minute of exercise affect your pulse rate?
Raisins	How many raisins are in a 1/2 oz box?
College_Life	Are you satisfied with your university?
Left_Right_Hand	Are you left handed or right handed?
Sampling	Random sampling vs. subjective sampling. Which is better?
Vote	Which party will you vote for?
Draw_Line	Can you draw a straight line without a ruler?
Random Selection	Which numbers are popular?

NOTE: This system is now only available within Central Michigan University

How does one minute of exercise affect your pulse rate?

- http://mth-stats.cst.cmich.edu/statact/real_time/online_activity/activity3/activity3.html

Are you left handed or right handed?

- http://mth-stats.cst.cmich.edu/statact/real_time/online_analysis/data_download.html

Activity: Applications of Graphical and Numerical Techniques – Pulse Rate Change Activity For Chapter 3

- **Objectives of this Activity:**
- Clean up data
- Review graphical displays and numerical summaries
- Identify outliers in the data.
- Explain the distribution in words, identify the shape of distribution and explain how the unusual cases affect the shape of the distribution.
- Applications of Empirical rule
- Review relative position measurements: Z-scores and percentiles.

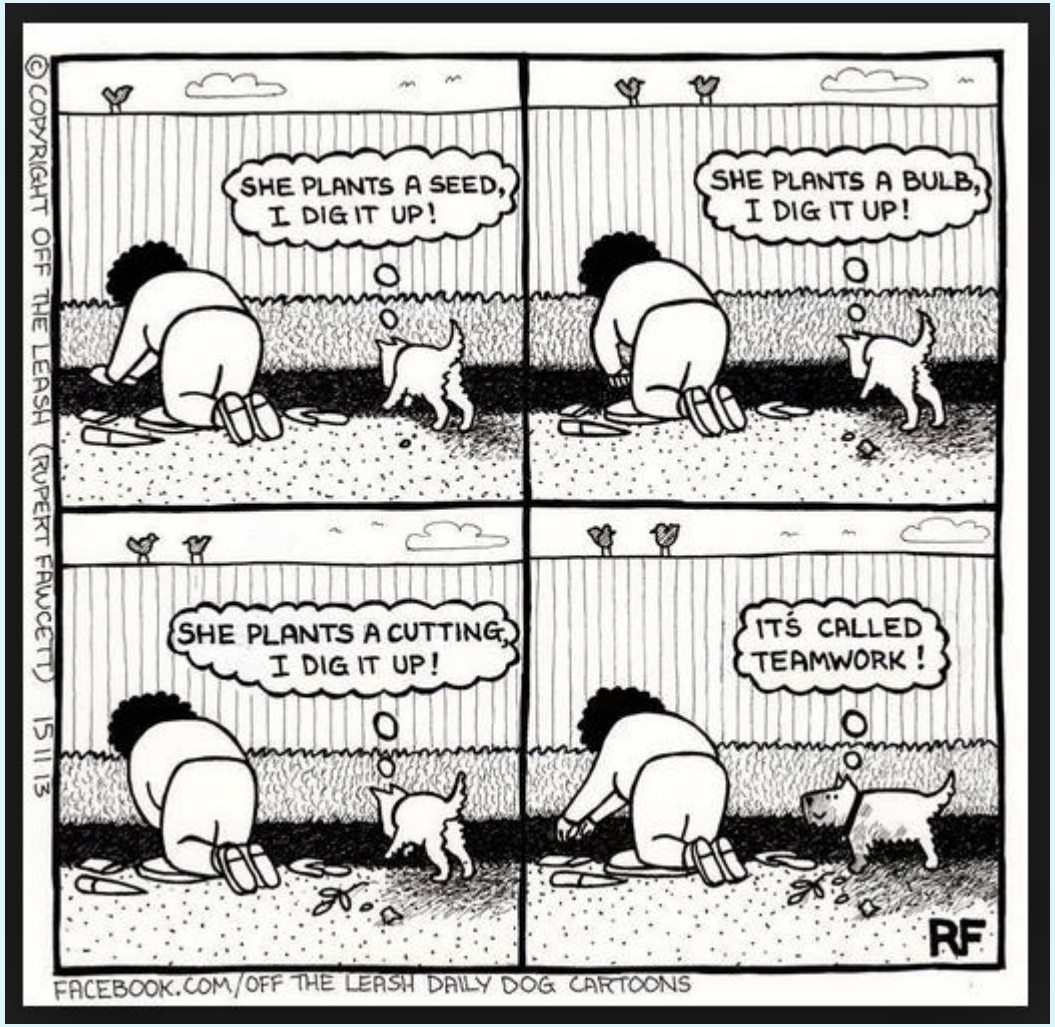
Data set: Activity3_Graph_Desp_Analysis_PulseRate(150).xlsx

Active Learning Classroom

Guiding Principles

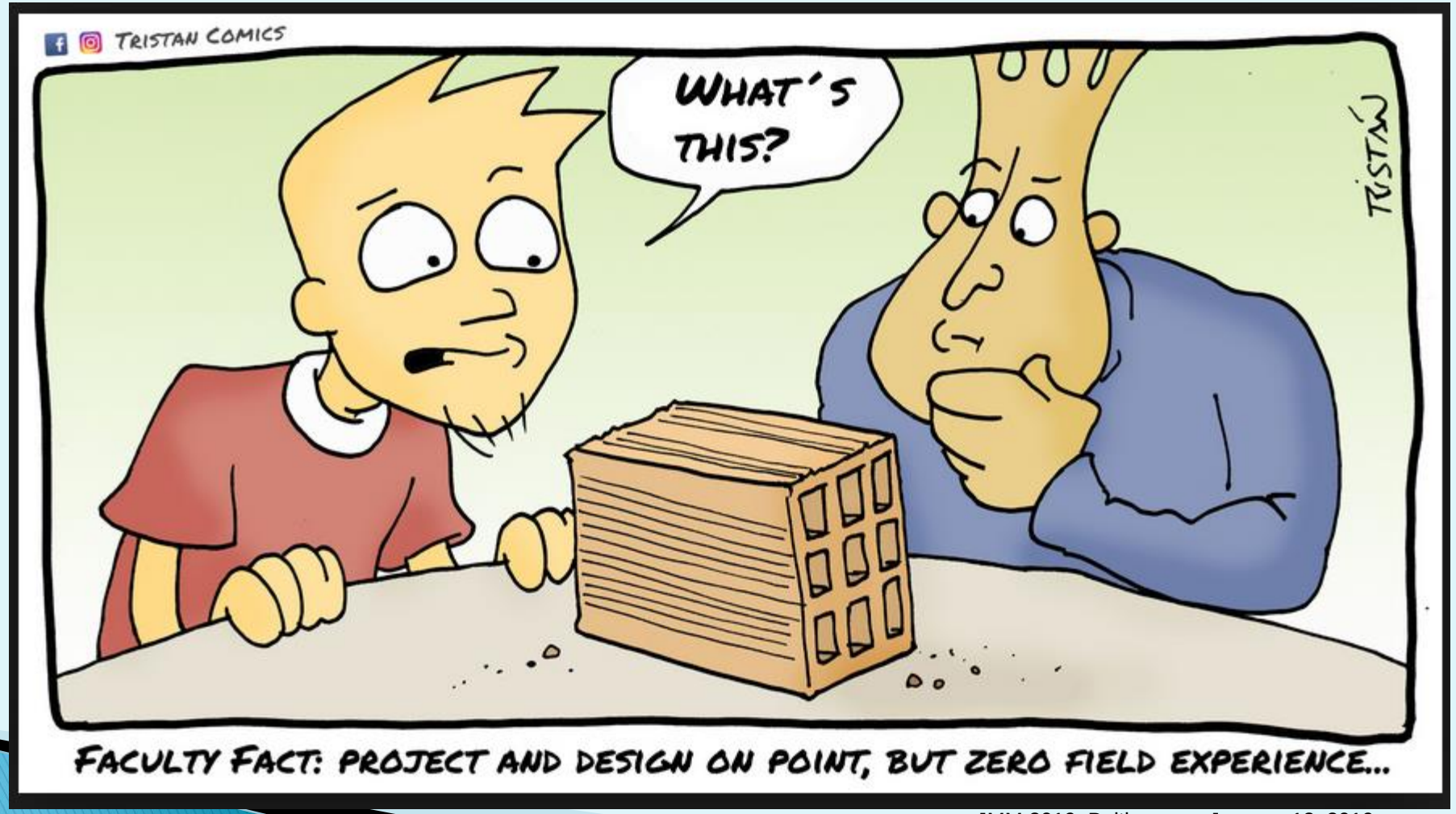
People learn better by constructing knowledge themselves through guided processes.

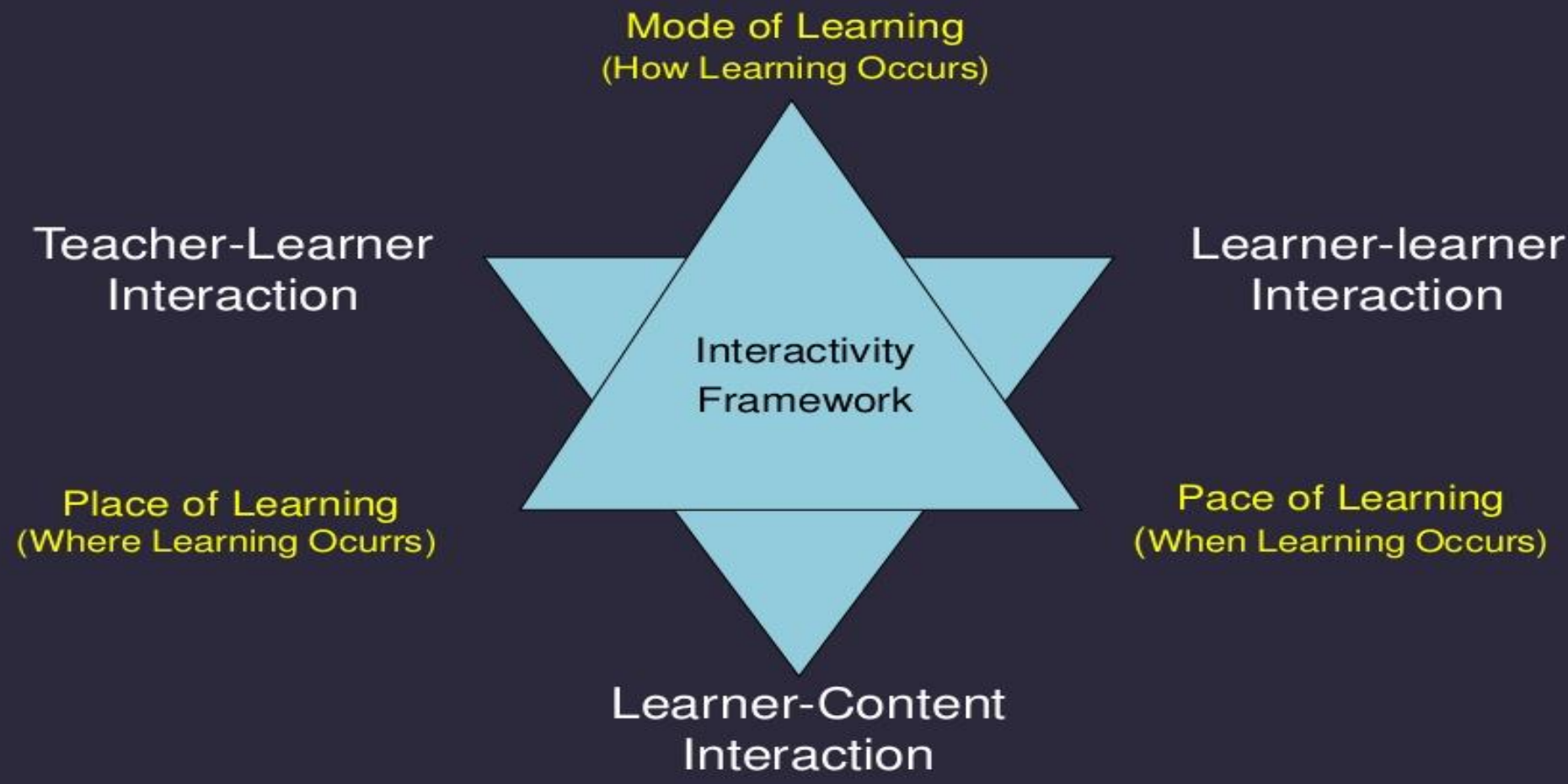
Active problem solving through teamwork promotes active learning.



Practice and feedback are essential ingredients for understanding new concepts.

People comprehend and retain information better when they can relate it to a familiar activity.





3. Designs for uncertain times…

DCU Ollscoil Chathair Baile Átha Cliath Dublin City University

Teaching is to give people HOPE

I do,
I understand

THE END

Thanks

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