

# **Course Structure: The Flipped Classroom Model**

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# Questions

- What is LITERACY?
- What is KNOWLEDGE?
- What is EDUCATION?
- What is ENGINEERING/SCIENCE EDUCATION?

# A Word Game

- Ocean/breeze
- Leaf/tree
- Sweet/sour
- Movie/actor
- Fuel/engine
- Bread/b\_tter
- Music/l\_rics
- Sh\_e/socks
- Phone/\_all
- Pen\_il/paper
- River/b\_at
- Wine/g\_ass
- Television/rad\_o
- L\_nch/dinner
- Tea\_her/student
- School/college
- Fruit/vegetable
- Computer/memory
- Chair/table
- Bird/nest

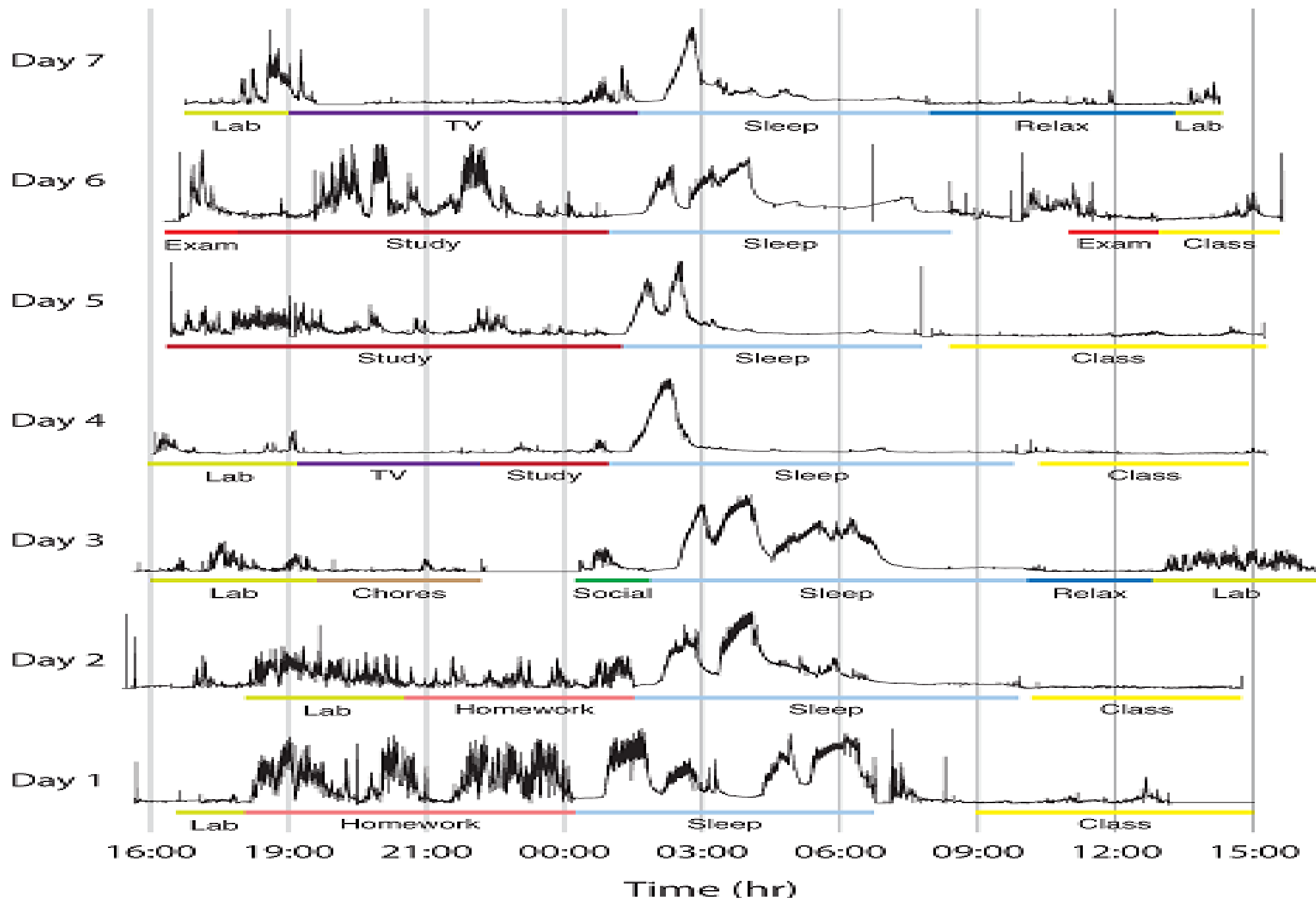
From: “The Talent Code: Greatness Isn’t Born, Its Grown”, by Daniel Coyle

# A Puzzle

- *You are in a boat on a lake. A large heavy rock is also in the boat. You heave the rock overboard and it sinks to the bottom of the lake.*
- *The water level in the lake:*
  - *Rises*
  - *Stays the same*
  - *Goes down*



# Electrodermal Activity



# Ideal Classroom

- What is TEACHING?

# Course Model

## – Flipped Classroom:

- [http://en.wikipedia.org/wiki/Flip\\_teaching](http://en.wikipedia.org/wiki/Flip_teaching)

The flipped classroom inverts traditional teaching methods, delivering instruction online outside of class and moving “homework” into the classroom.

## THE INVERSION



Fig. From <http://www.knewton.com/flipped-classroom/>

# The Learning Process is Important

- Sincere, hard-working: committed learning
- Time management: methodical learning
- Social (discussion & participation): group learning
- Straightforward, honest: ethical learning



# Online Content: Video

Concepts packed as modules to watch at own pace

- Video based (ppt & blackboard)
    - Typically 10-20 min
  - Interactive with embedded questions
    - Pause, think, understand, answer
  - Total watching time: 1.30 to 2 hours per week
  - All reference material provided, including slides
- You choose your own
    - Time
    - Place
    - Group
    - Pace

# Online Content: Practice Problems

- Concepts and grouped concepts have associated practice problems
  - Work at your own pace and time
- Problems: Multiple choice, Fill-In-Blanks and Descriptive
  - First two are scored online

# Tutorial: In-Class Activity

- Designed for 1-1.5 hours
- Discussions, Clarifications, Q&A session, Practice problems
- **Compulsory Attendance**
  - Ok to miss if-and-only-if tutorial already submitted

# Learning

## Personalized

- Instructor talking just to you :)
- **ALL** get to answer questions without fear of embarrassment
- Focused small group tutorials

## Flexible

- Your choice of time, place, group
- Your pace: take as much time to view or solve questions
- No procrastination due to periodic quizzes

## Complete

- Each concept is complete: video, slides, reference material, practice problems
- Interspersed watching and study time
- Move ahead after mastering concept

# Cons

- No immediate feedback
- Compensated by interaction during tutorial sessions
- Also use online discussion forum
  - Post questions, get answers from friends, TAs or instructor
  - Can email instructor also if urgent

# Comparison

## Traditional model

- Fixed Timing/place
- Watch once
- Instructor's pace
- Few questions
- Target few students
- **Immediate feedback**

## Flipped model

- Flexible timing/place
- Watch many times
- **Student's pace**
- **Many questions**
- **Target all students**
- No immediate feedback