

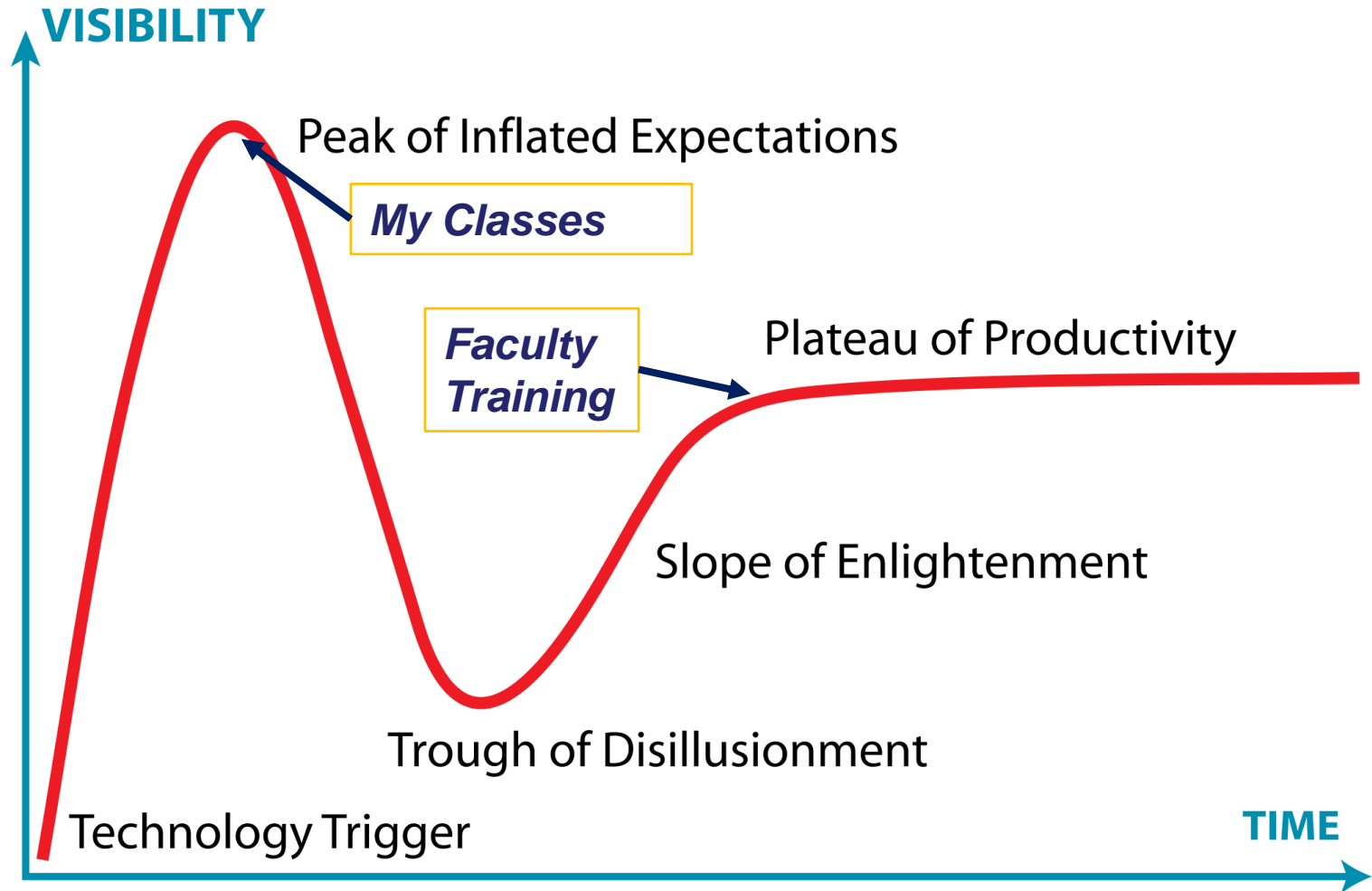
Blending: Perspective from a Program with Large Enrollment

ELECTRICAL **[+]** COMPUTER

E N G I N E E R I N G

Bonnie Ferri
Associate Chair for Undergraduate Affairs

Gartner Hype Cycle



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Pedagogical Objectives

- 1) Improve consistency in quality and coverage in multi-section classes
 - 13 sections, 600 circuits students **this semester**
- 2) Increase student understanding and induce higher-level thinking through active and collaborative learning and hands-on activities



MOOCs (Coursera)



Linear Circuits

Bonnie Ferri, Bruno Frazier, Nathan Parrish

MOOC Statistics:

- 58,300 students enrolled in four offerings
- Over 737,000 lectures viewed
- Over 633,000 problems submitted

Courses Supported:

- ECE 2040 (180 students/term)
- ECE 3710 (450 students/term)



Introduction to Electronics

Bonnie Ferri, Allen Robinson

MOOC Statistics:

- 45,000 students enrolled in two offerings
- 193,000 videos watched and 106,000 problems submitted in first offering

Courses Supported:

- ECE 2040
- ECE 3710
- ECE 3741

Georgia Tech: Online Component

- Video lectures
- Videos of sample worked problems
- Homework (graded automatically)
- Piazza discussion forum



Georgia Tech: In-Class Component

- Two-Minute Quiz on Lecture Material
- Supplemental lectures giving depth or extra worked problems
- Q&A
- Worksheets on complex material
- Hands-On Activities
 - Minilabs completed during class time



Results: ECE3710

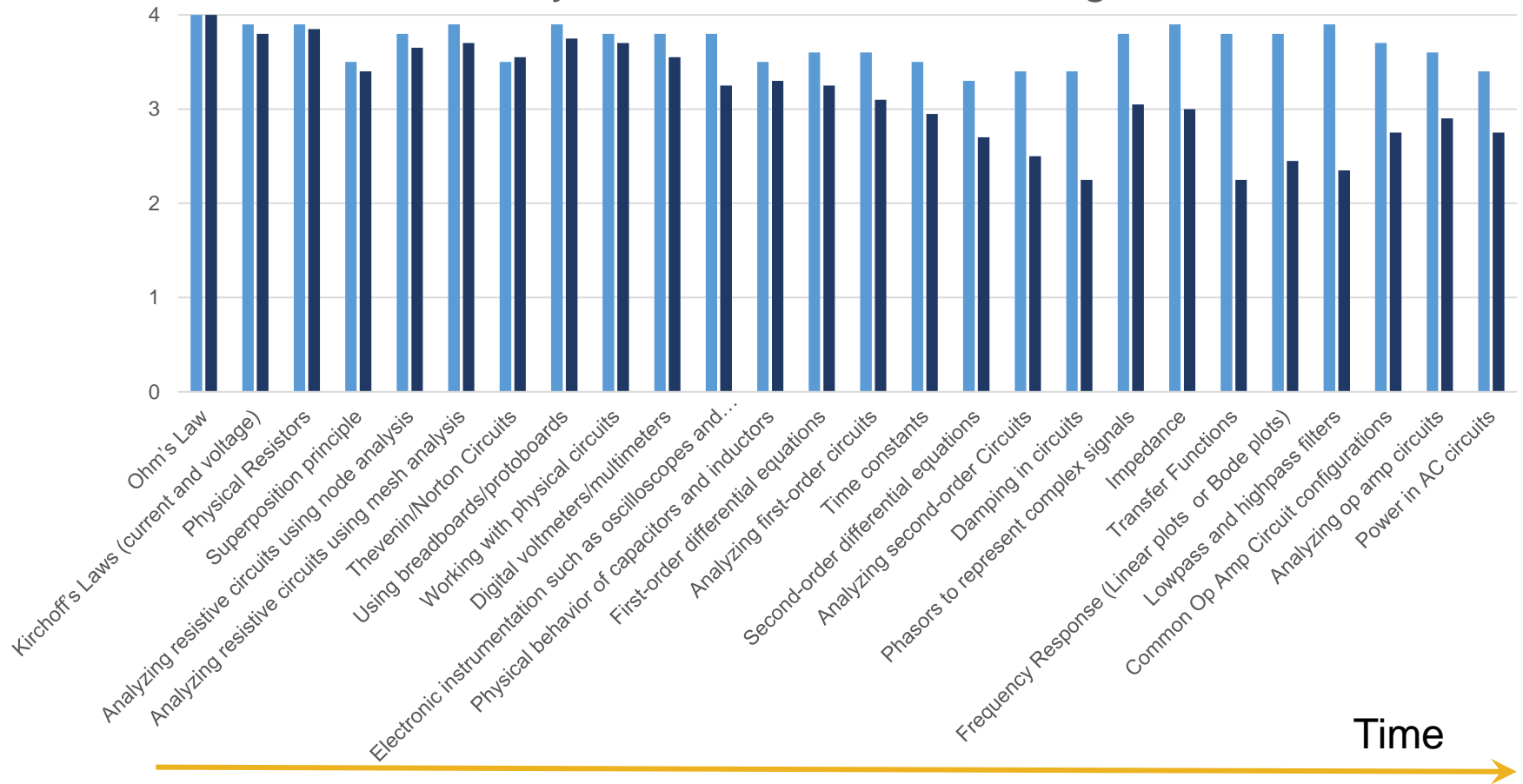
- 450 students/term in 9 sections

Old Format	Current Format
<ul style="list-style-type: none">• Incomplete coverage• Mismatch in coverage of 25%• Curves on grades	<ul style="list-style-type: none">• 100% coverage of syllabus• Common homework and tests, no curve on grades
GPA: 2.5 – 3.7	GPA: 2.9 - 3.1
No in-class labs	6 in-class labs

Results: ECE2040

Rate your level of understanding

Blended Traditional



Time

Evolution of Blending

- Revise videos based on student performance and questions
- Instruct students on how to succeed (*take notes*)
- Students want some lecture time
 - Basic concept/methods on video and advanced material and problem solving in class
- Give sufficient scaffolding of ideas before doing worksheets
- Repeat motivation for blended methodology numerous times to students

Key: value-added in class

Challenges

- **Logistics**

- TA support, video taping support, lab support

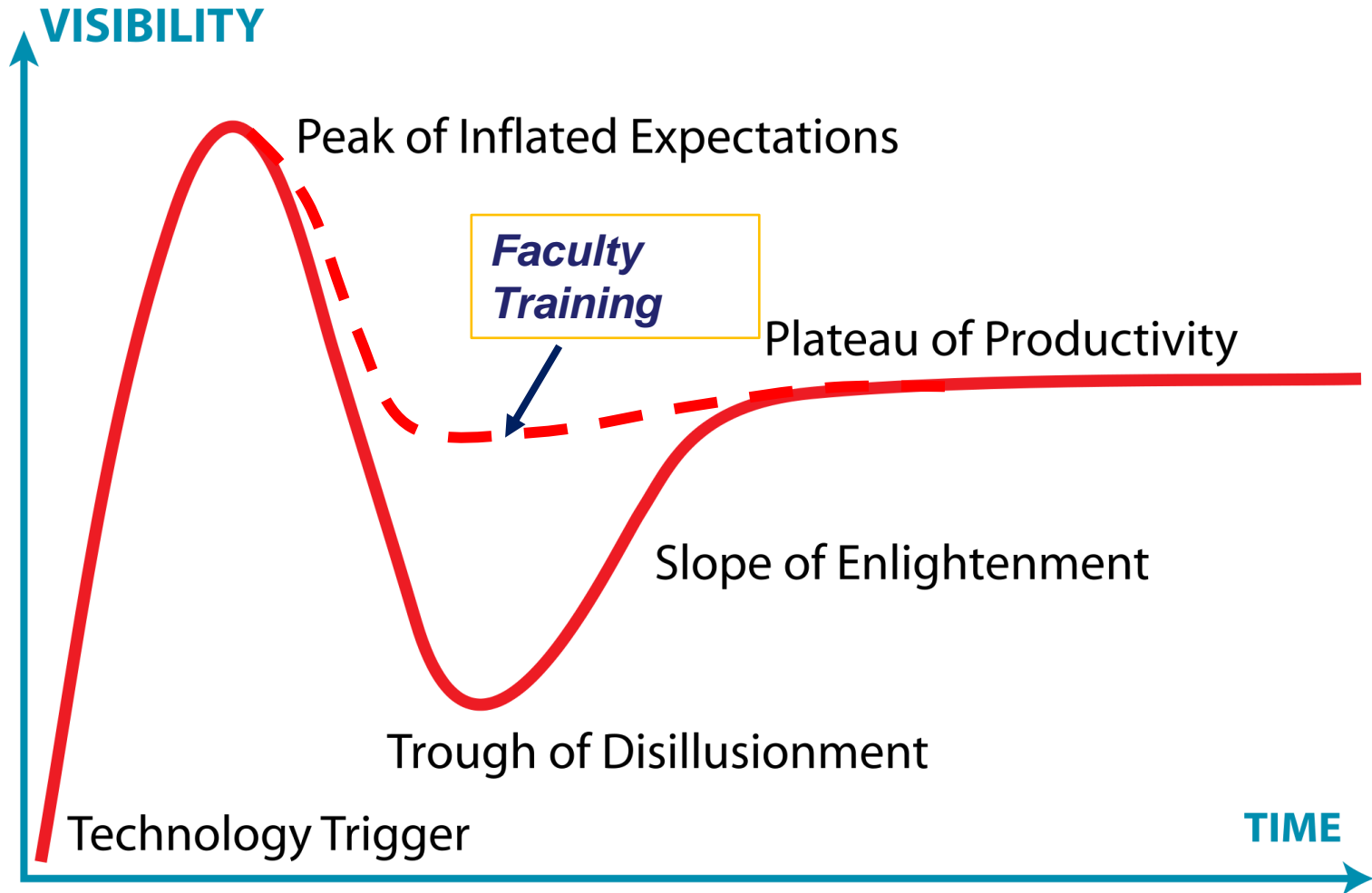
- **Faculty Buy In**

1. Value (high impact on learning with small investment of time)
2. Expectation of Success
 - Comfort level
 - Faculty training/mentoring

Faculty Training

- Active Learning Workshops
 - Blended classroom experiments (11 faculty members)
- Hands-On Learning
 - 1800 students/term, 25 instructors/term
- Innovation in Education Committee
 - Faculty resources
 - Video equipment and taping, TA support
 - ECE Teaching Fellows
 - Instructional videos on blended learning for faculty

Gartner Hype Cycle



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