



Chulalongkorn University
จุฬาลงกรณ์มหาวิทยาลัย
Pillar of the Kingdom

Learning Innovation Center



Enhancing Students' Critical Thinking Skill through Flipped Classroom

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Research Questions

- Can a flipped learning model enhance critical thinking skill of students in a research method class?
- What are the relationships between students' attitude towards flipped learning and other outcomes, i.e., their learning behaviours, perceived critical thinking skill, and score on critical thinking test?

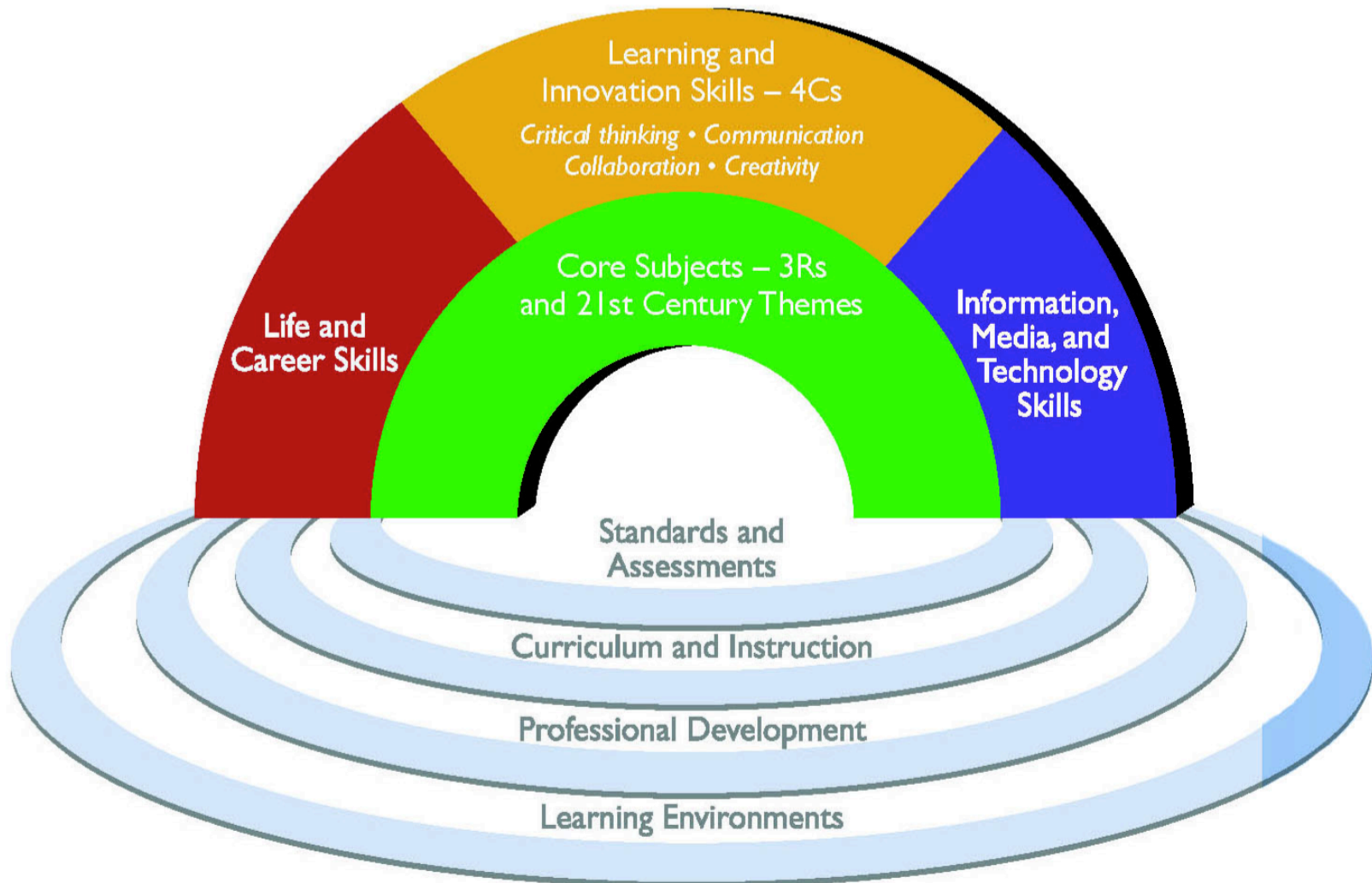


Critical Thinking

- The ability to actively analyse and evaluate arguments (Abrami et al., 2008)
- Consists of **6 skills**, i.e., interpretation, analysis, evaluation, inference, explanation, and self-regulation, **16 subskills**, and **19 dispositions**, e.g., inquisitive, open-mindedness (by American Philosophical Association – in Facione, 1990)
- One of the essential skills for students to succeed in life and work in the 21st century (Partnership for 21st Century Learning, 2015)



Framework for 21st Century Learning





Flipped Learning

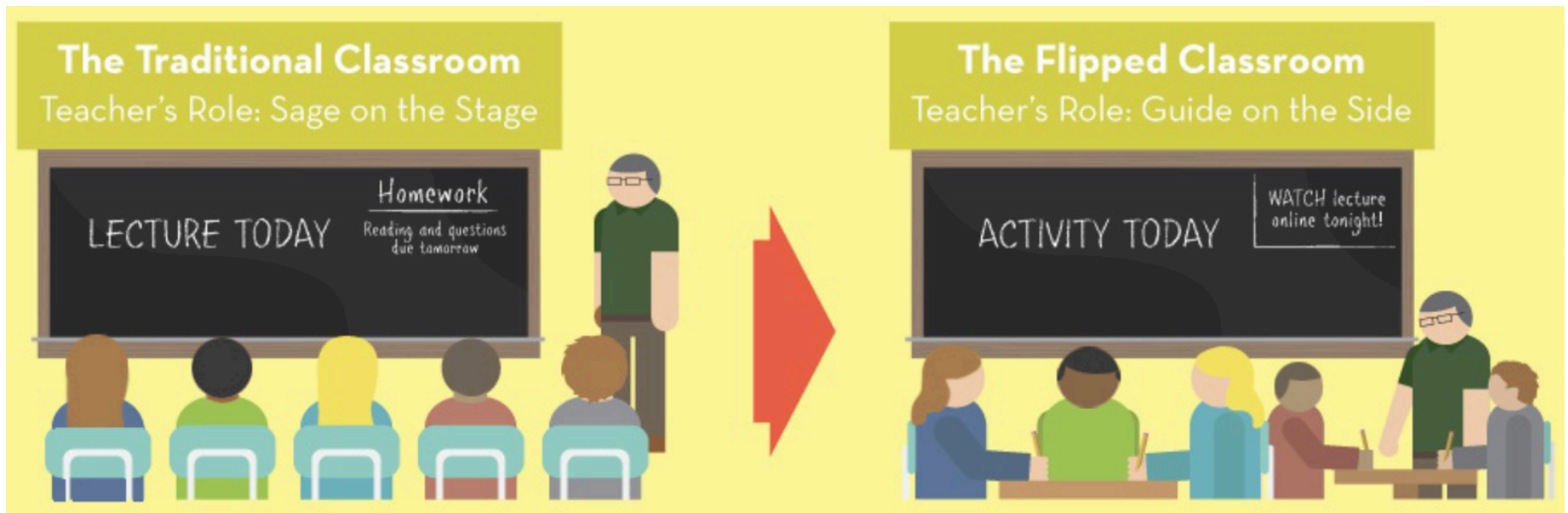
- “Flipped learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.”

flippedlearning.org/

definition



Flipped Learning



(www.knewton.com)



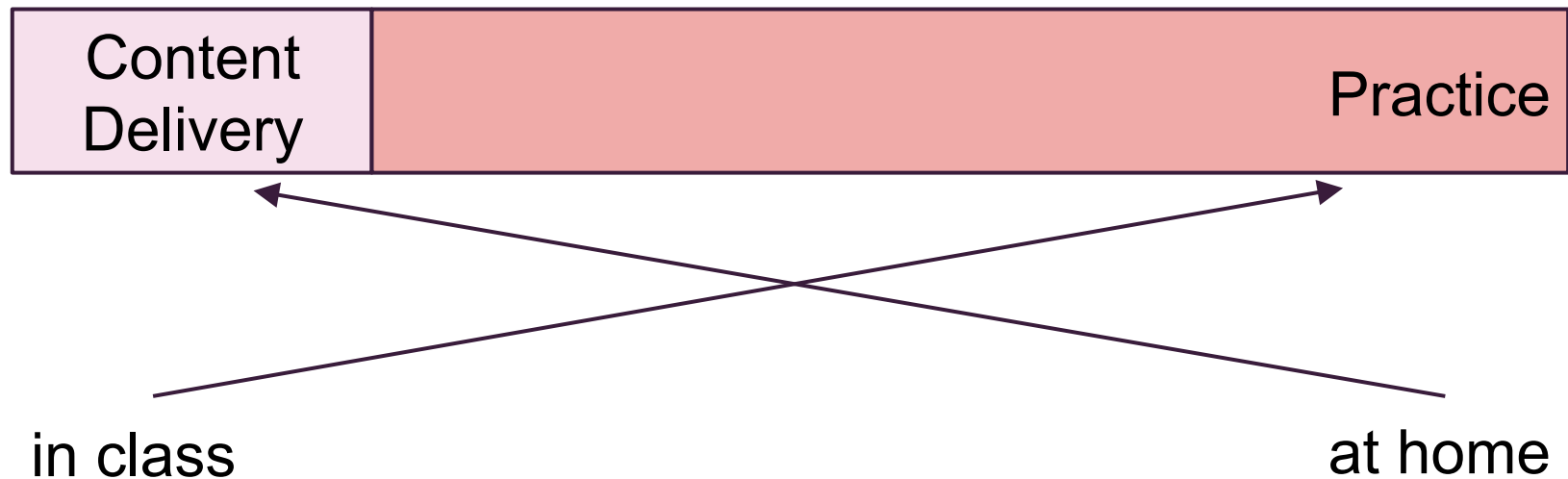
Flipped Learning



(Sam, 2014)



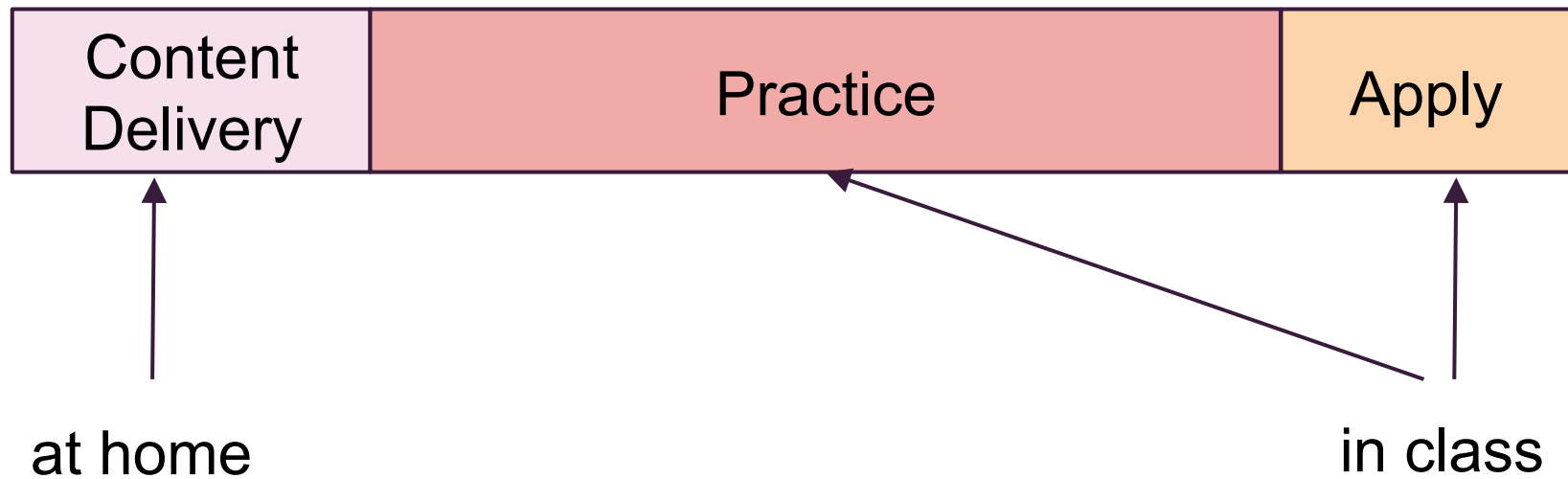
Flipped Learning



(Sam, 2014)



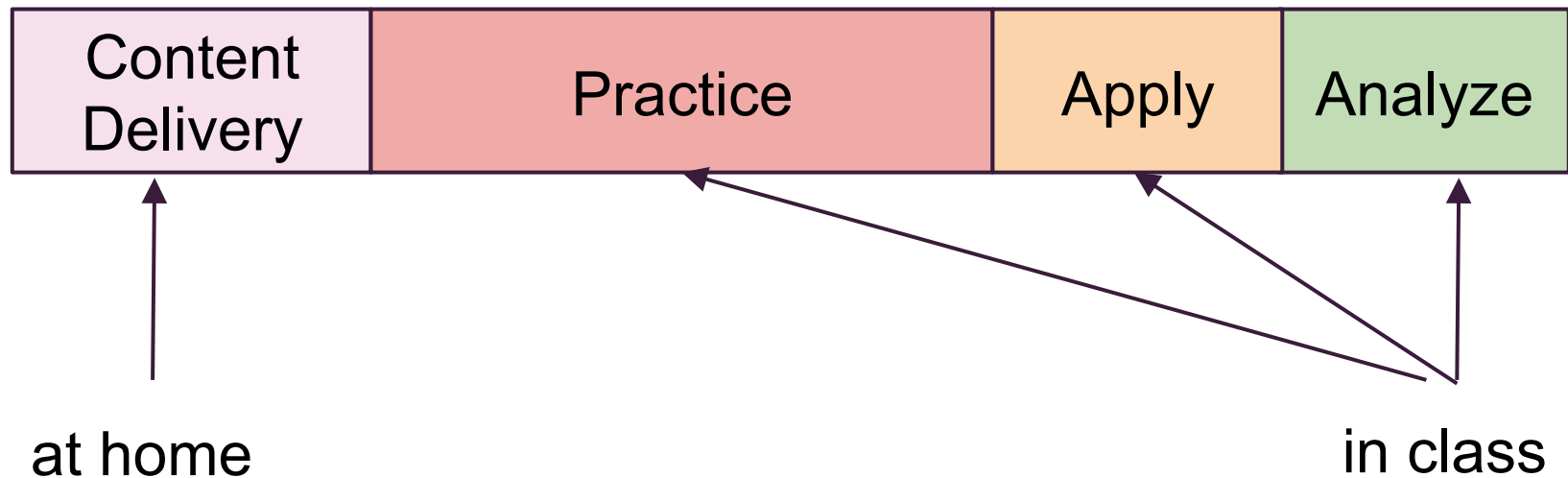
Flipped Learning



(Sam, 2014)



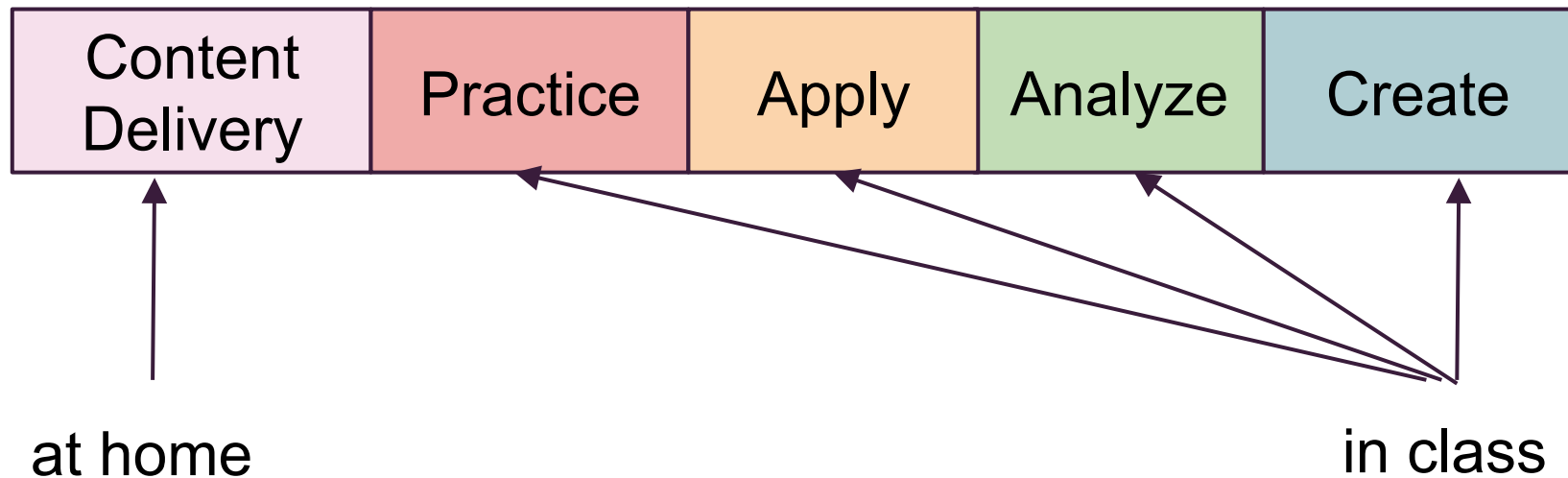
Flipped Learning



(Sam, 2014)



Flipped Learning



(Sam, 2014)



Method

■ Participants:

- 85 students (59 females and 26 males) enrolled in the Fall 2014 Research Method in Psychology

■ Learning Management System:

- Blackboard
- Facebook



Method

- **Content Delivery**
- **Classroom Activities**
- **Outcome Measures**

YouTubeTH



Upload



CREATOR STUDIO



DASHBOARD



VIDEO MANAGER

Videos

Live Events

Playlists

Search History

Likes



COMMUNITY

**CHANNEL**

Playlists 24

24



New playlist

Search playlists

Why Research Methods?

Why research? What do you need about research? How do you know what you know? How do you know what you know? How do you know what you know?

Ways of Knowing

Authority: Authority is a way of knowing. It is a way of knowing that is based on the authority of others. It is a way of knowing that is based on the authority of others. It is a way of knowing that is based on the authority of others.

Science as a Way of Knowing

Science: Science is a way of knowing. It is a way of knowing that is based on the scientific method. It is a way of knowing that is based on the scientific method. It is a way of knowing that is based on the scientific method.

Philosophy

Philosophy: Philosophy is a way of knowing. It is a way of knowing that is based on the philosophical method. It is a way of knowing that is based on the philosophical method. It is a way of knowing that is based on the philosophical method.

The Road of Research to Psychology

Psychology: Psychology is a way of knowing. It is a way of knowing that is based on the psychological method. It is a way of knowing that is based on the psychological method. It is a way of knowing that is based on the psychological method.

6 videos

3800212: Week 01 Scientific Thinking



3800212: Week 02 Research Questions



What to measure? **Scales of Measurement** **Estimating Measures of Reliability & Validity** **Statistical Analysis** **Statistical Analysis**
Descriptive Statistics: summarize data & describe *Descriptive Statistics: summarize data & describe* *Descriptive Statistics: summarize data & describe*










7 videos

3800212: Week 03 Measurement and D



3800212: Week 04 Observational and S





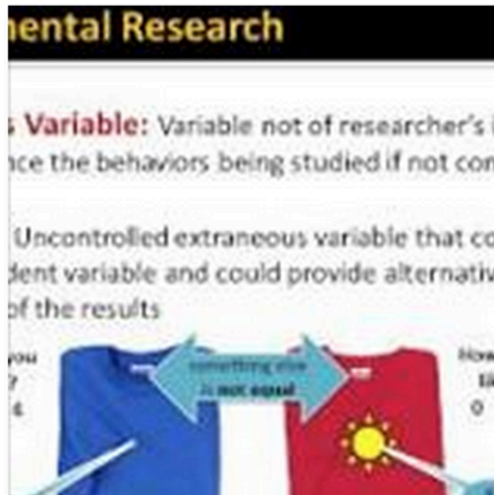
Method: Content Delivery



อ.ดร.ทิพย์นภา หวนสุริยา

September 23, 2014

วิดีโอเล็กเซอร์ของสัปดาห์นี้มาแล้วค่ะ



3800212: Week 06 Intro to
Experimental Research

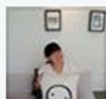
YOUTUBE.COM

Like · Comment · Share



Komm Pophum and 10 others like this.

✓ Seen by 104



PQ Penpen อรุณสวัสดิ์ค่ะอาจารย์ อาจารย์ลิ้มลงซีทหรือเปล่าคะ แฮะๆ ._____.

September 23, 2014 at 5:15pm · Like · 4



Method: Content Delivery



อ.ดร.ทิพย์นภา หวนสุริยา

November 5, 2014

วิดีโอที่พยายามจะเปิดให้ดูวันนี้ แต่เปิดที่ห้องเรียนไม่ได้ มีเรื่องการทดลองที่น่าสนใจ ลองดูเผื่อเป็น idea ออกแบบการวิจัยสนุกๆ ค่ะ





Method: Classroom Activities

■ Classroom Activities:

- Weekly quizzes and instant feedback
- Group discussion of case studies
- Coming up with research projects
- Data analysis and writing up reports
- Peer assessment of group reports



Method: Classroom Activities



อ.ดร.ทิพย์นภา หวนสุริยา asked a question.

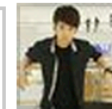
October 26, 2014



ในวันที่นิสิตเรียนจบจากคณะจิตวิทยา นิสิตต้องการเป็นบัณฑิตที่มีทักษะ ความรู้ความสามารถในศาสตร์จิตวิทยาอยู่ในระดับใด



เท่าเทียมนักศึกษาจิตวิทยาในต่างประเทศ



+37



เหนือกว่านักศึกษาจิตวิทยาสถาบันอื่นในประเทศไทย

+7



เหนือกว่านักศึกษาจิตวิทยาในต่างประเทศ

+4

2 More...

Like · Comment



Chawallanat Laopoonpat and 4 others like this.



Seen by 104



Method: Classroom Activities



Kik Chotika ▶ 3800212 Research
Methods in Psychology

November 27, 2014 ·

กลุ่ม "ขอโทษนะคะ พอจะรู้จัก ใครที่เล่นอินเทอร์เน็ต 2-3
ชั่วโมงต่อวันบ้างรึป่าว"

5637416638 จันทร์เพ็ญ โชควินุลย์สุข

5637418938 จุฑารัตน์ พงษ์ชู

5637425238 โชติกา จันทรวาณย์

5637475638 พัชรพร สะอาดยิ่ง

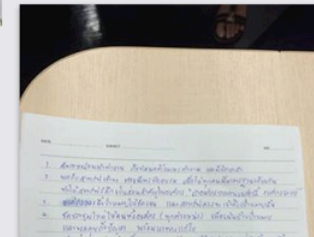
5637498038 วรารี สุขจิตินธุ์ — with PQ Penpen, Nui Sa-
artying and Waree Sookjadit.

Like · Comment · Get Notifications · Share

สรวงชนก โพธิ์สนสมวงศ์ likes this.



Kik Chotika





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Method: Classroom Activities





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Method: Classroom Activities





Method: Classroom Activities

Learn helplessness แนว $P \times E$ Factorial Designs

- IV1. = เพศ (between subject, subject variable)
- IV2. = เวลาในการเรียนต่อสัปดาห์ (between subject, manipulated variable)
- DV. = มีภาวะสิ้นหวังที่เกิดจากการเรียนหรือไม่ (Learn helplessness)
- Notation 2×2 factorial
= 2 IVs, one with 2 levels, one with 2 levels
= 4 total conditions

- Matrix

	ชาย	หญิง
เรียนต่อสัปดาห์	A	C
ไม่เรียนต่อสัปดาห์	B	D



Wararee Sookjadit

November 5, 2014 · 11

Like

People You May Know



Peppa Worakitt

1 mutual friend

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Method: Classroom Activities





Method: Outcome Measures

- **Critical thinking skill test**
- **Perceived critical thinking skill**
- **Self-reported learning behaviours**
- **Attitudes towards flipped classroom**



Method: Outcome Measures

■ Critical thinking skill test

- Developed in Thai using Watson-Glaser Critical Thinking Appraisal (Watson & Glaser, 2002) as a framework.
- Measured three times during the semester
- Consisted of five dimensions:
 - inferences
 - recognition of assumptions
 - deductions
 - Interpretations
 - evaluation of arguments



Method: Outcome Measures

■ Critical thinking skill test: Sample Questions

Evaluation of arguments

“Should the government provide ‘baby grants’ to help support each dependent child in a family so that the family standard of living is not lowered by having children?”

- Yes; many families who cannot now afford it would then provide better childcare, and this would greatly improve the general health of the nation. (Strong or Weak argument?)
- No; government provision of ‘baby grants’ would involve additional public expenditure of money. (Strong or Weak argument?)

(Watson, & Glaser, 2002)



Method: Outcome Measures

■ Perceived Critical Thinking Skill

- Four items on a 0 – 4 scale

**“Please evaluate yourself on each of the following skills
before and after taking this class”**

1. analysing incoming information with critical mind
2. selecting appropriate statistics for each research design
3. analysing the strengths and weaknesses of a research study
4. understanding the importance of research in psychology

(none) 0 1 2 3 4 (proficient)



Method: Outcome Measures

■ Self-reported learning behaviours

- Four items on a 0 – 5 scale

“How often did you engage in each of these behaviours in this class?”

1. watching all the videos before coming to class
2. taking notes while watching the lectures
3. attending class
4. participating and fully engaging in classroom activities

(never) 0 1 2 3 4 5 (almost all the time)



Method: Outcome Measures

■ Attitude towards Flipped Classroom

- One item on a 0 – 5 scale

“What do you think of the flipped classroom model?”

(do not like at all) 0 1 2 3 4 5 (like it very
much)



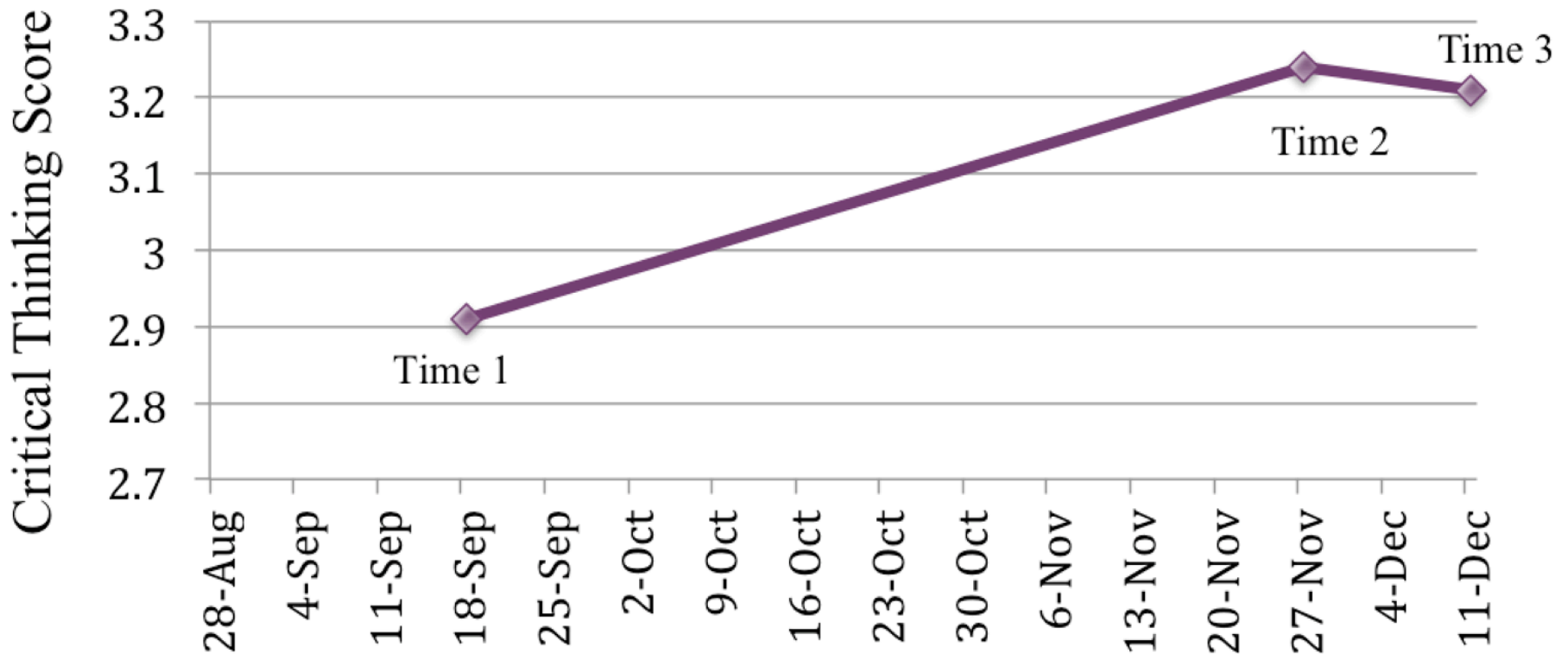
Results

- **Can a flipped learning model enhance critical thinking skill of students in a research method class?**
 - Time 1 -- $M_1 = 2.91, SD_1 = 0.54$
 - Time 2 -- $M_2 = 3.24, SD_2 = 0.47$
 - Time 3 -- $M_3 = 3.21, SD_3 = 0.54$



Results

Figure 1. Mean critical thinking scores
($N = 85$)





Results

■ Can a flipped learning model enhance critical thinking skill of students in a research method class?

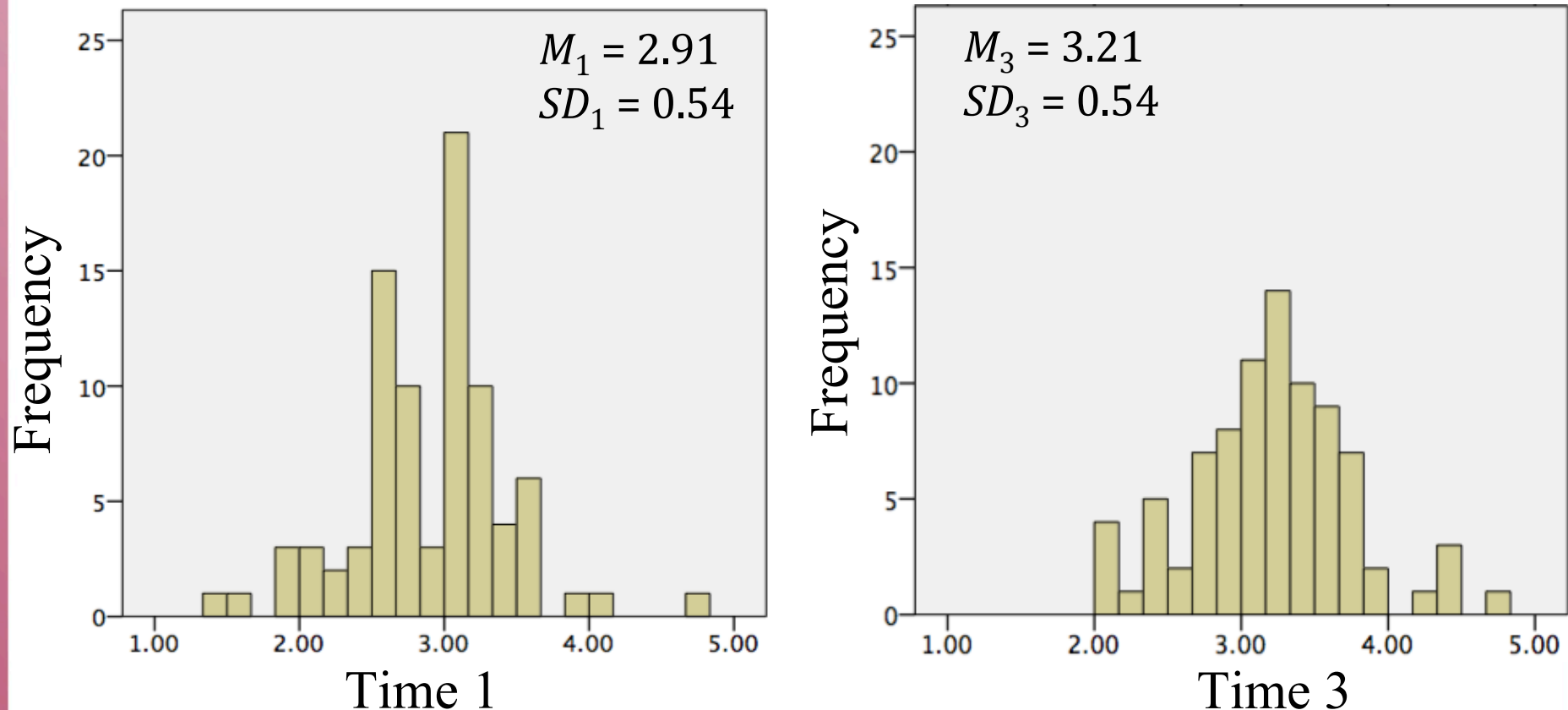
- Time 1 -- $M_1 = 2.91, SD_1 = 0.54$
- Time 2 -- $M_2 = 3.24, SD_2 = 0.47$
- Time 3 -- $M_3 = 3.21, SD_2 = 0.54$

- Wilks' Lambda = .809, $F(2, 83) = 9.80, p < .001$
 - $M \text{ Difference}_{2-1} = 0.33, SE = 0.08, p < .001$
 - $M \text{ Difference}_{3-1} = 0.30, SE = 0.08, p < .001$
 - $M \text{ Difference}_{2-3} = 0.03, SE = 0.07, p = 1.00$



Results

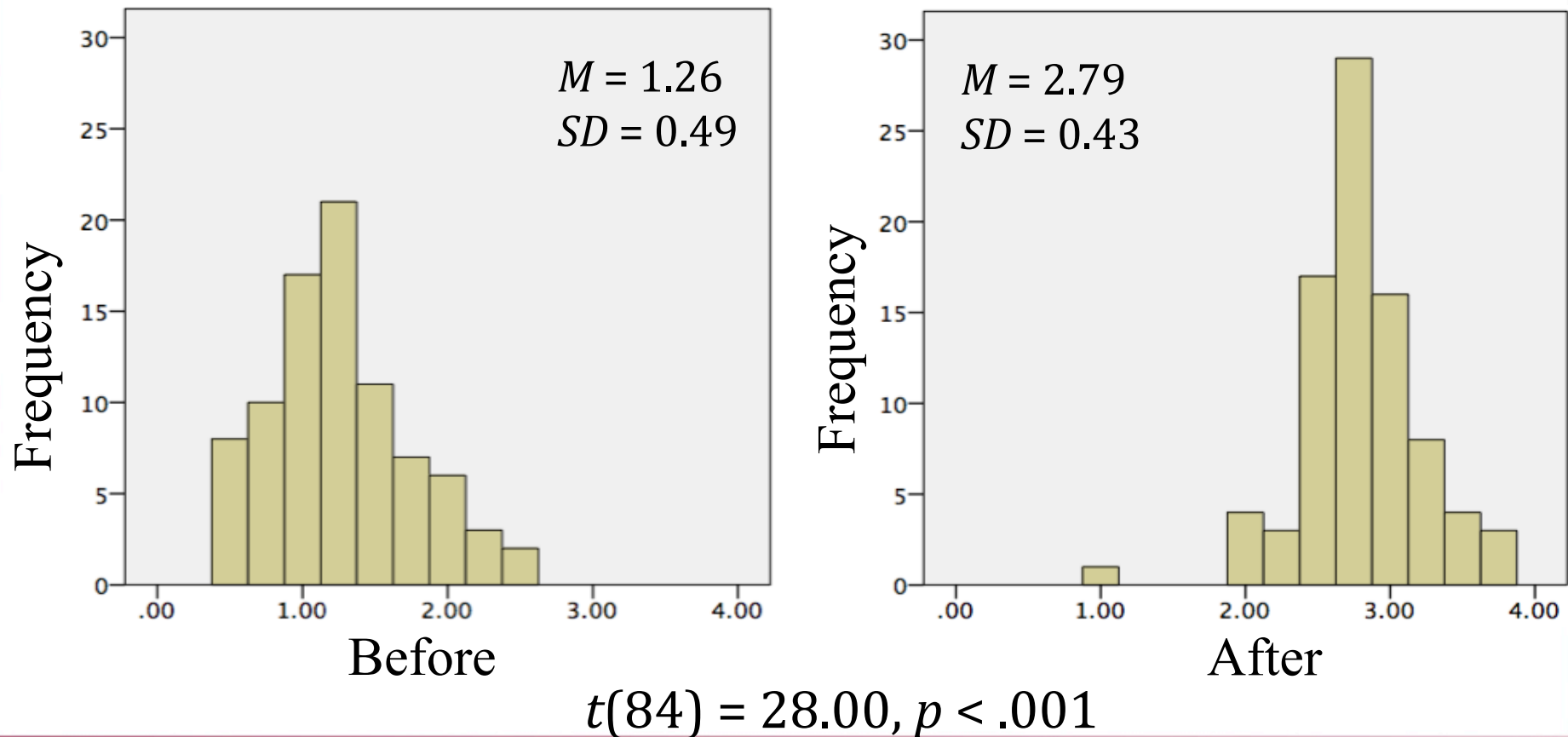
Figure 2. The distribution of critical thinking scores at Time 1 and Time 3





Results

Figure 3. The distribution of students' perceived critical thinking skill before and after taking the class





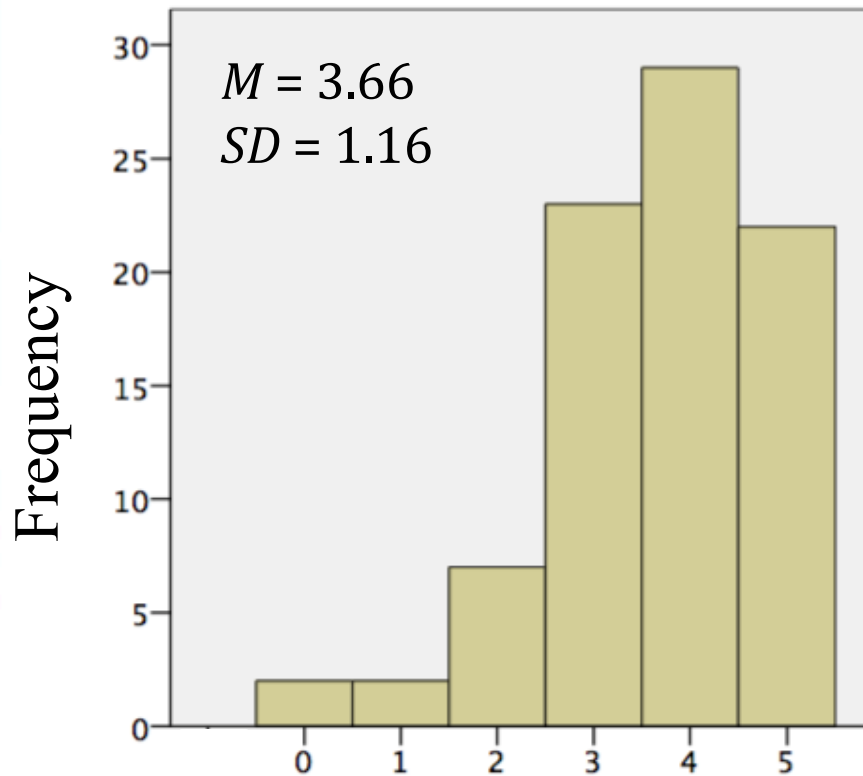
Results

- **What are the relationships between students' attitude towards flipped learning and other outcomes, i.e., their learning behaviors, perceived critical thinking skill, and score on critical thinking test?**

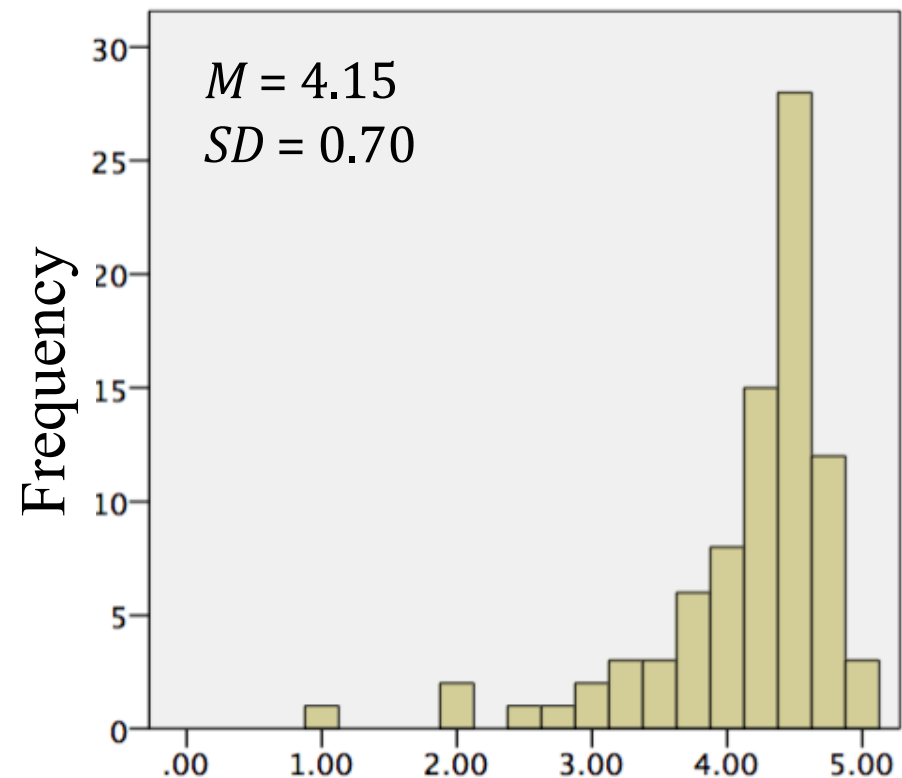


Results

Figure 4. The distribution of attitude towards flipped classroom and Self-report learning behaviours



Attitude towards Flipped Classroom



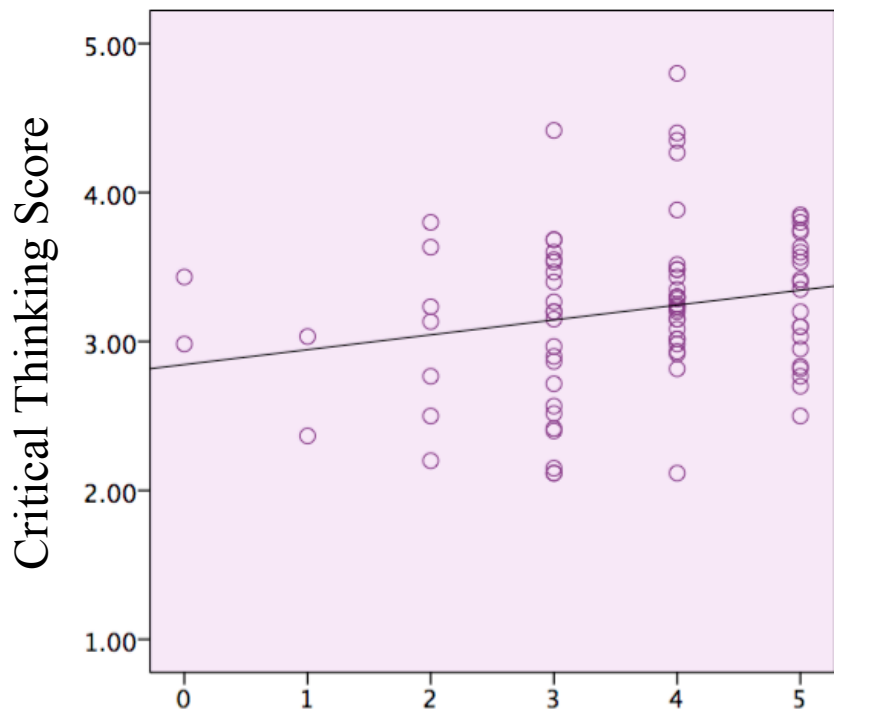
Self-reported learning behaviors



Results

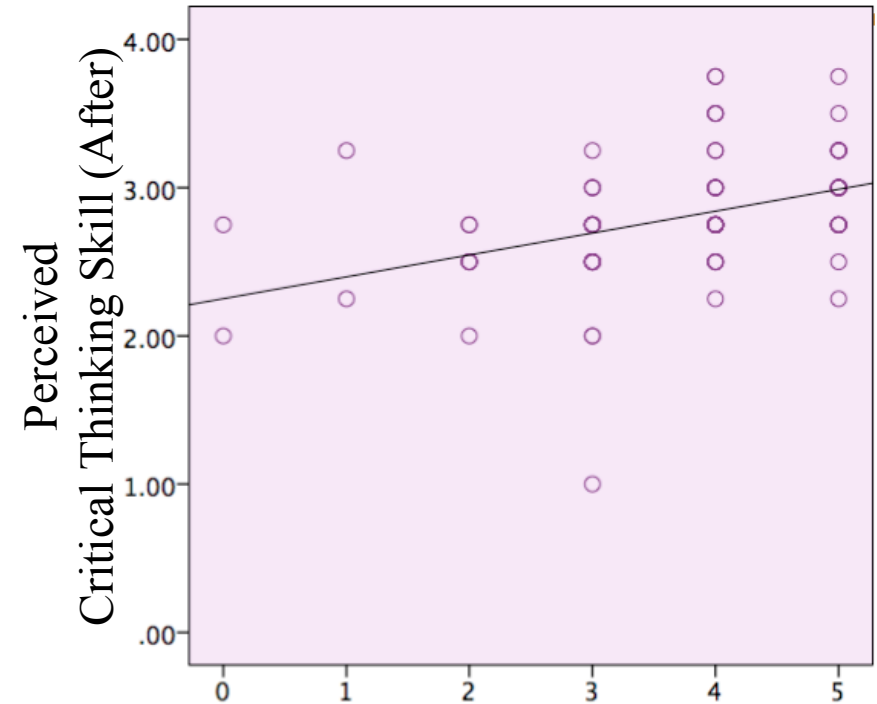
Correlations between variables ($N = 85$)

$$r = .215, p < .05$$



Attitude towards Flipped Classroom

$$r = .402, p < .001$$



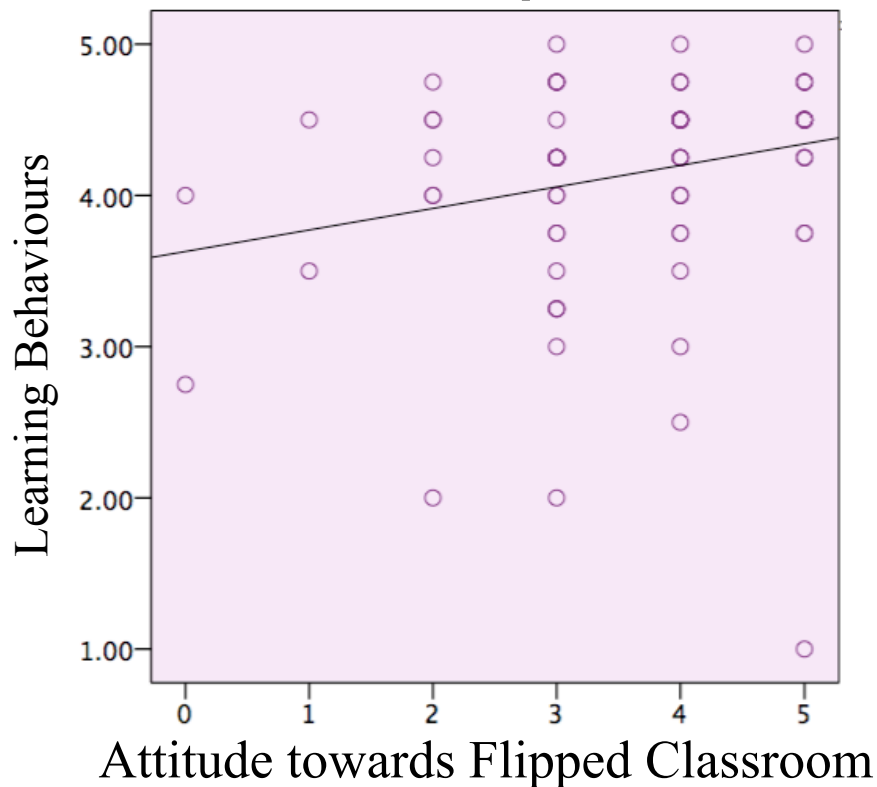
Attitude towards Flipped Classroom



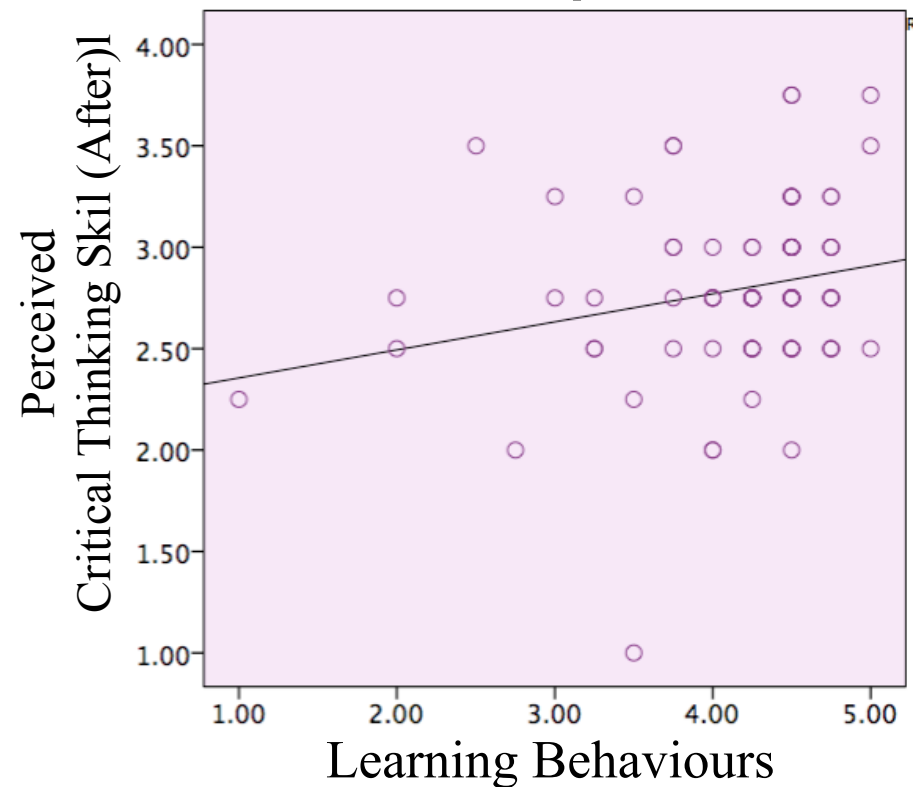
Results

Correlations between variables ($N = 85$)

$$r = .235, p < .05$$



$$r = .228, p < .05$$





Results

Means, Standard Deviations, and correlations among Variables ($N = 85$)

Variables	M	SD	1	2	3	4	5	6
1 Critical thinking score Time 1	2.91	0.54						
2 Critical thinking score Time 2	3.24	0.47	-.031					
3 Critical thinking score Time 3	3.21	0.54	.086	.304**				
4 Perceived CT skills – before class	1.26	0.49	.122	.001	-.020			
5 Perceived CT skills – after class	2.79	0.43	.022	-.041	.071	.399***		
6 Self-reported learning behaviors	4.15	0.70	-.024	.024	-.071	.075	.228*	
7 Attitude towards flipped classroom	3.66	1.16	.113	-.003	.215*	-.035	.402***	.235*

Note: * $p < .05$, ** $p < .01$, *** $p < .001$



Students' comments

- 70% of the comments were positive. Students like flipped classroom because they:

gain new perspectives
from classmates
during the discussion

have opportunities to
practice applying what
they have learned

can go back and
review the lecture
videos anytime



gain deeper
understanding of
the materials
through practice



Students' comments

- 30% of the comments were neutral or negative.
Students don't like flipped classroom because they:

think the workload is
much more than
traditional classroom

prefer live lecture in
traditional classroom

still don't understand
the purpose of flipped
classroom





Students' Suggestions

- More dynamic videos with better-quality sound
- More exciting in-class activities, e.g., a debate, role play
- Videos should be posted at least one week ahead of time so they have enough time to watch and learn before coming to class
- Online discussion board where they can leave questions or comments anonymously



Next Steps

- Improve the quality of the lecture videos
- Integrating quiz questions into the videos
- More and better designed classroom activities
- Smaller class size, quicker and more thorough feedback
- Better measures of outcome variables
- Better research design



TEDEd Lessons Worth Sharing

Lessons Series Community Clubs

What Aristotle and Joshua Bell can teach us about persuasion - Conor Neill



162,397
Views

9,405
Questions
Answered

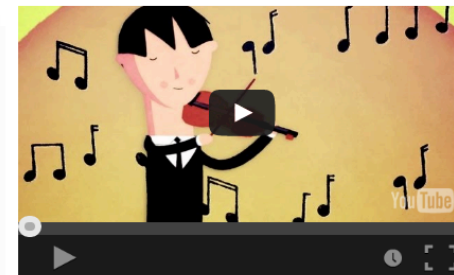
Let's Begin...

Imagine you are one of the world's greatest violin players, and you decide to conduct an experiment: play inside a subway station and see if anyone stops to appreciate when you are stripped of a concert hall and name recognition. Joshua Bell did this, and Conor Neill channels Aristotle to understand why the context mattered.

1 2 3 4 5 6 7 8

What ensures that you build credibility and connection?

- ☐ A Always make sure that you develop your idea
- ☐ B Ensure that you have thought about ethos, pathos, and logos
- ☐ C Both A and B
- ☐ D None of the above



Watch

Think

Dig Deeper



References

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Q&A



