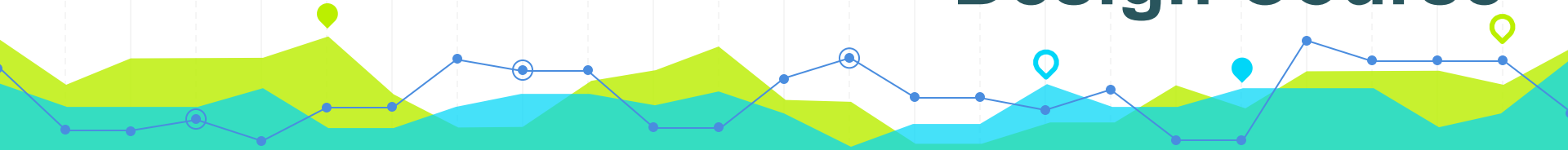


Pedagogical Learning from a Future-Oriented Interdisciplinary Design Course



Mei-Di Chen, Shang-Hsien Hsieh

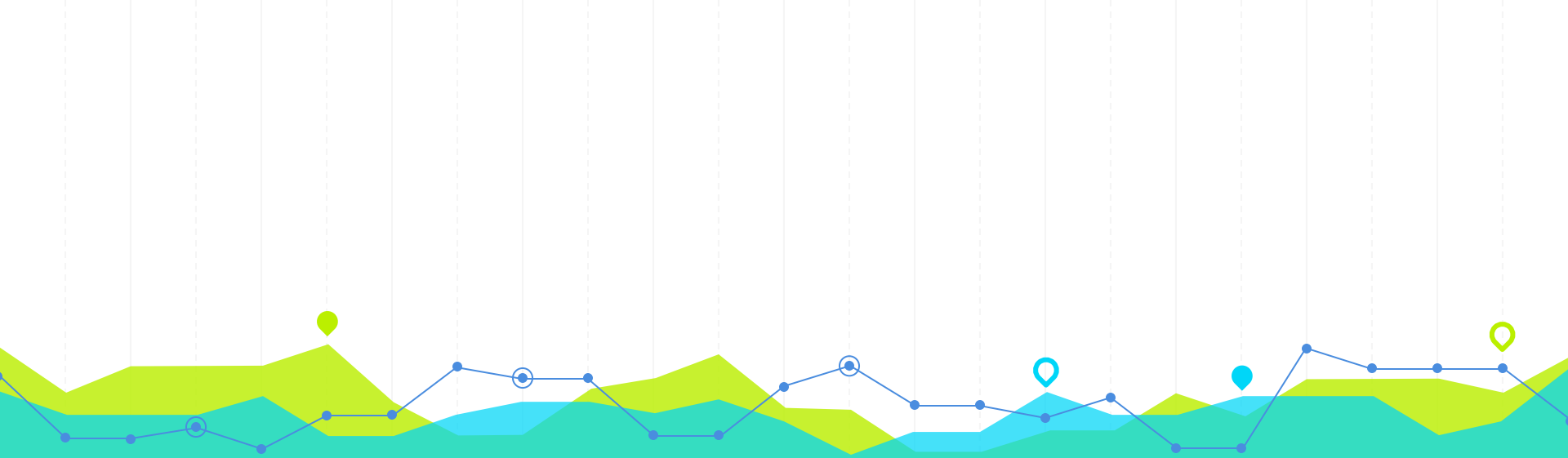
Department of Civil Engineering, National Taiwan University

Mei-Mei Song

Graduate Institute of Futures Studies, Tamkang University

Shih-Yao Lai

Graduate Institute of Building and Planning, National Taiwan University



Course Background

1

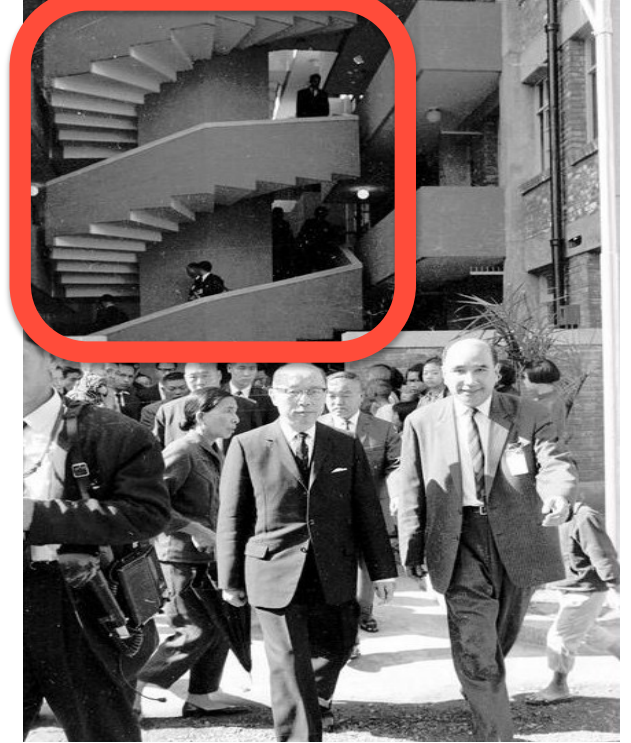
Theme: Revitalization of an old community in Taipei with future visions

Case:

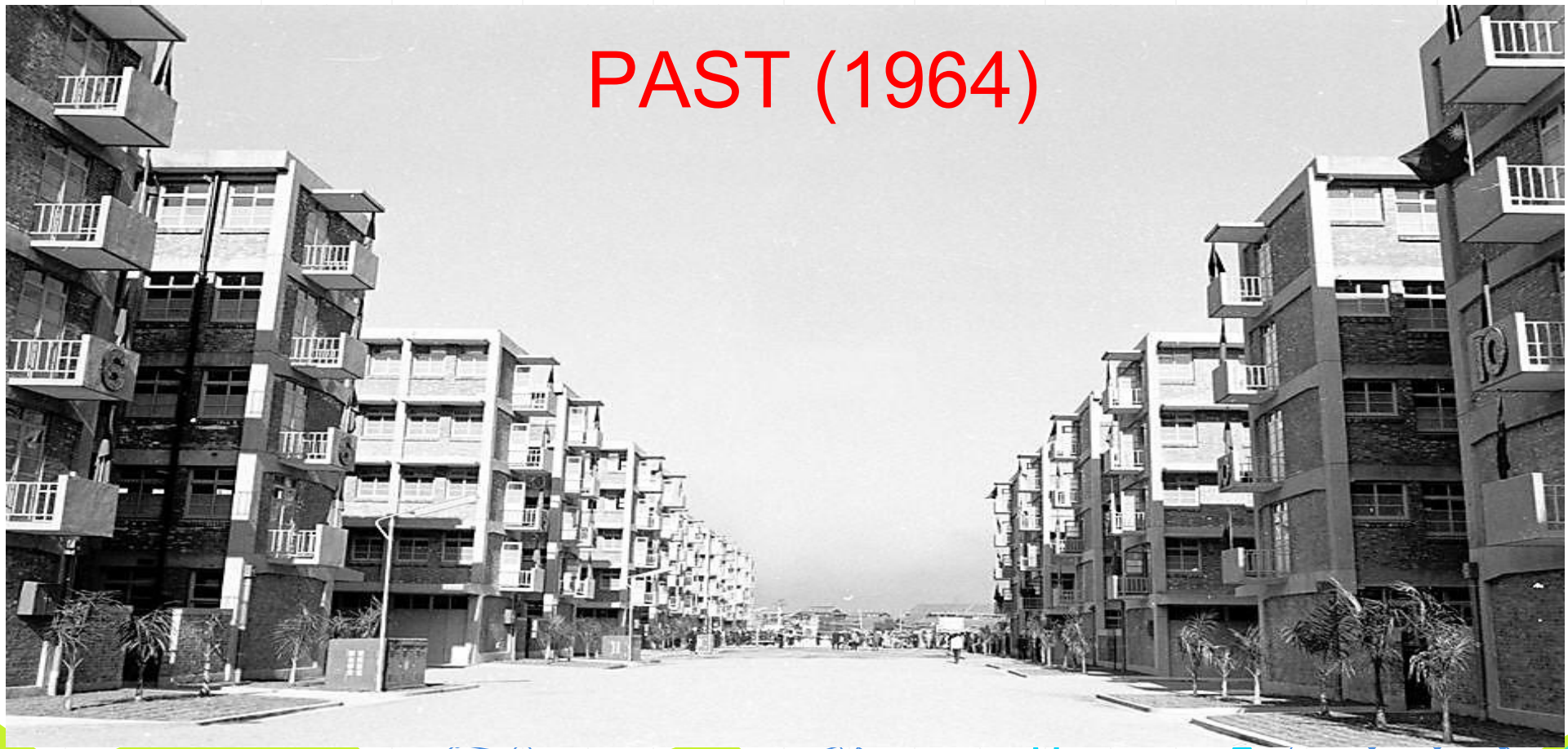
Nanjichang (Southern Airport) community

- Constructed 50 years ago
- Aging population
- Underprivileged families
- New immigrants

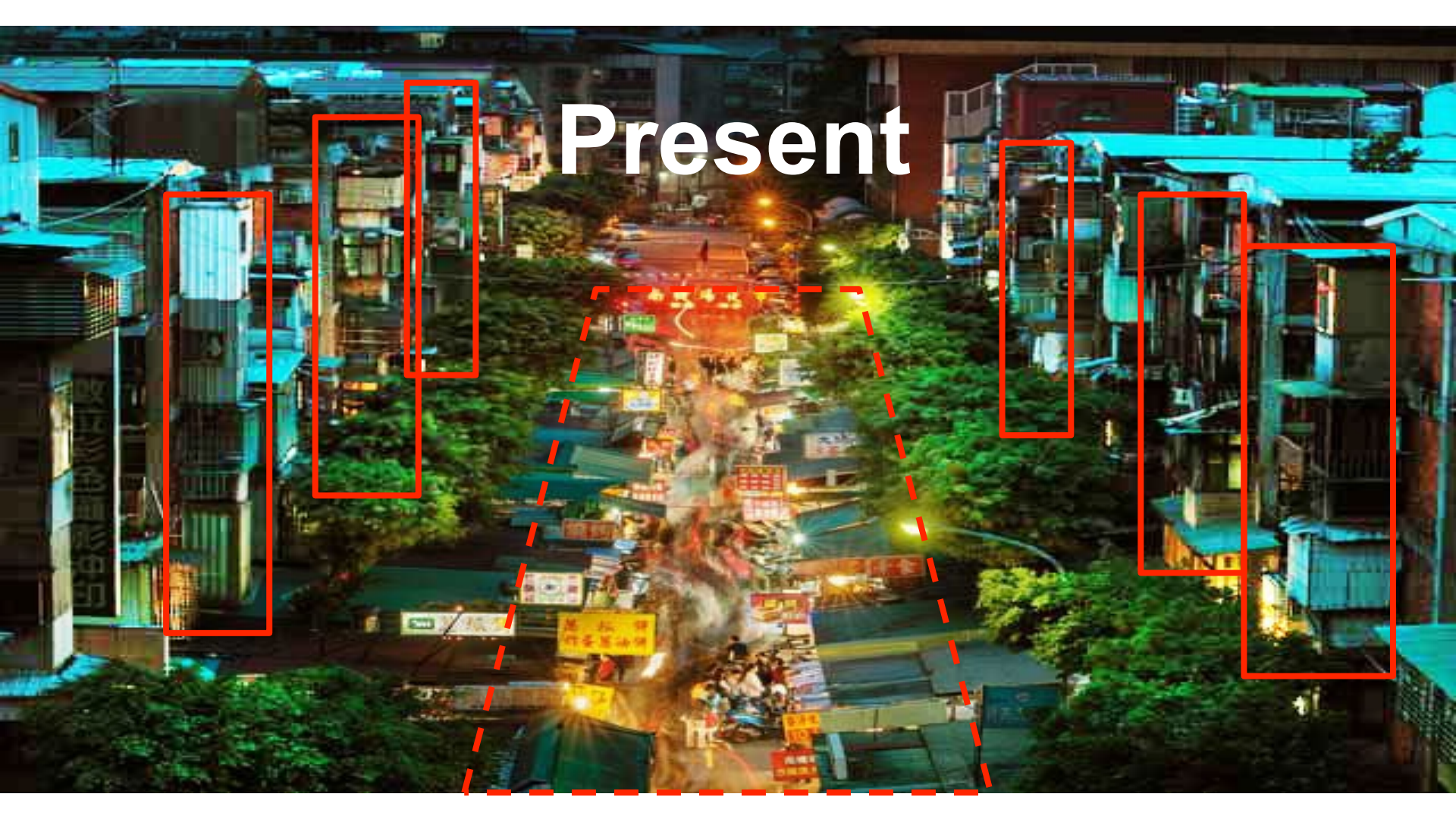




PAST (1964)



Present





Identical



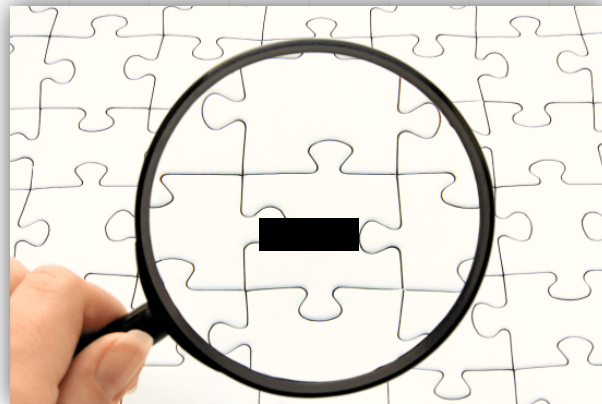
● Nanjichang community

● Interdisciplinary team of teachers

Differences



National
Taiwan
University



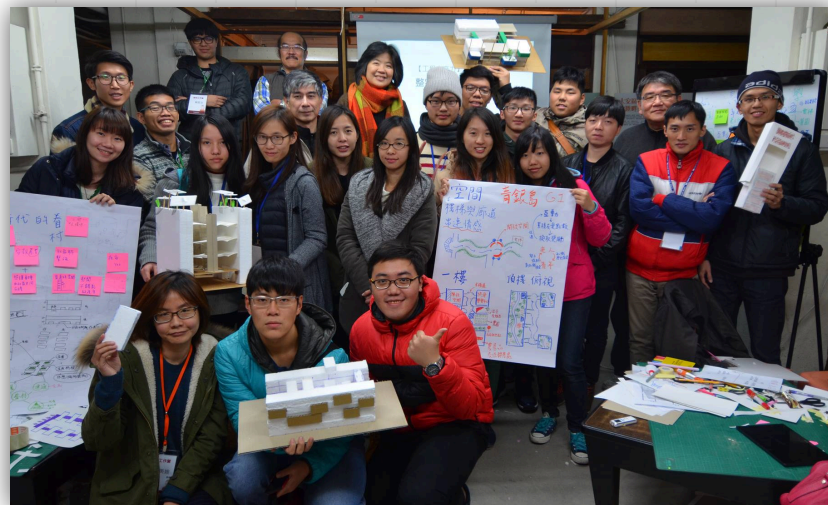
● Only NTU students

● Project theme was assigned

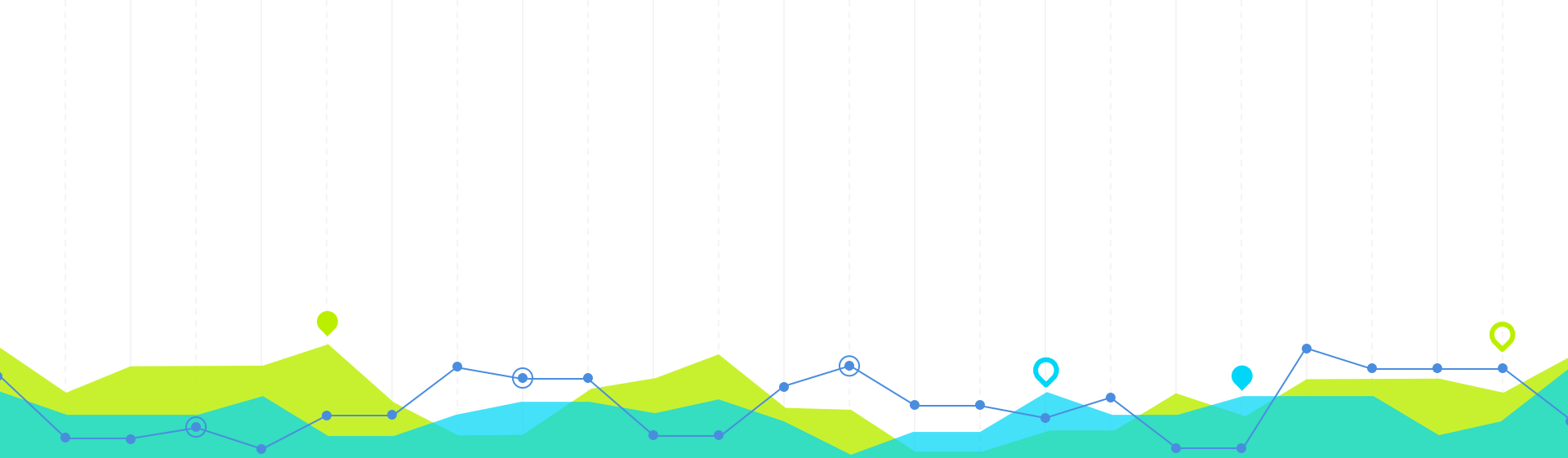
Differences



● Professional groups



● Pre-course 3-day workshop



Course Design & Implementation **2**

This year

Spring 2016 (3 or 6 credit hours)

Theme: Old building revitalization of Nanjichang community with future visions

National Taiwan University

Civil Engineering Capstone Course

in Department of Civil Engineering

(3 credits)

Practice of Environment Planning and Design (I) course

in Graduate Institute of Building and Planning

(6 credits)

Energy Conservation Design in Green Buildings course

in Department of Mechanical Engineering

(3 credits)



Course objectives

**Interdisciplinary
Teamwork**

**Emerging
Technologies**

**Problems
Solving**

Creative Thinking

Futures Thinking



Five stages

Stage I: Pre-course Workshop (Three days)

Outcome: interdisciplinary teams building

Stage II: Community Scanning (Week 1-3)

Outcome: scanning report

Stage III: Site Selection (Week 4-6)

Outcome: professional groups' analysis report

Stage VI: Building Project Planning (Week 7-9)

Outcome: mid-term report

Stage V: Design Proposal (Week 10-15)

Outcome: building project proposal (final report)

Pre-course workshop

● Futures thinking workshop



G1

- Big Data.
- 自動駕駛
- Virtual Personal Assistants.

各領域所需
↳ 市場走向使用
文字化
講究證據
↳ 資料在證
證

多故人期待的
價值觀錯亂
↳ 過度依賴科技
投資問題
事故處理
失業問題

學校消失
作息改變
交通成本降低
↳ 營運人力

講求效率
照顧陪伴需求

資訊流通迅速
移動需求 → 老盲重
交通安全

配置車流路線 → 降低塞車
生活品質與效能提高 → 老頑照顧 工作效率
逐漸失去自理能力 → 難依賴科技
不受場域局限

浮

G4 南機機場整宅二期 2066 南機之肺

自適應建築

新鮮空氣供應
空汙日益

沒有機車 渴望 自然

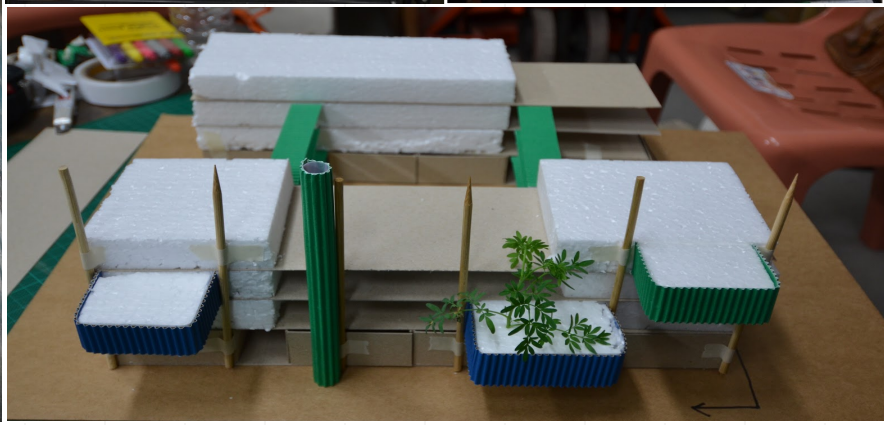
A hand-drawn sketch of a building with a large, open-air structure, possibly a terminal or a public space. The drawing is done in black ink on a white background. There are several text annotations around the drawing, including '自適應建築' (Adaptive Building), '新鮮空氣供應' (Fresh Air Supply), '空汙日益' (Air Pollution Increasing), and '沒有機車 渴望 自然' (No Motorcycles, Yearning for Nature). The drawing shows a multi-story building with a large, open-air area in front of it, and a road or path leading to it.

Pre-course workshop

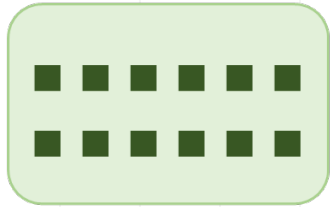


● Community observation

● Design & prototyping



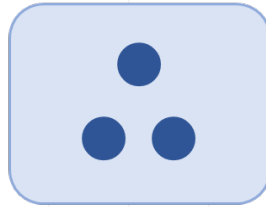
Professional & project groups



Civil engineers
Group



Architects & planners
Group



Mechanical engineers
Group



Group A



Group B

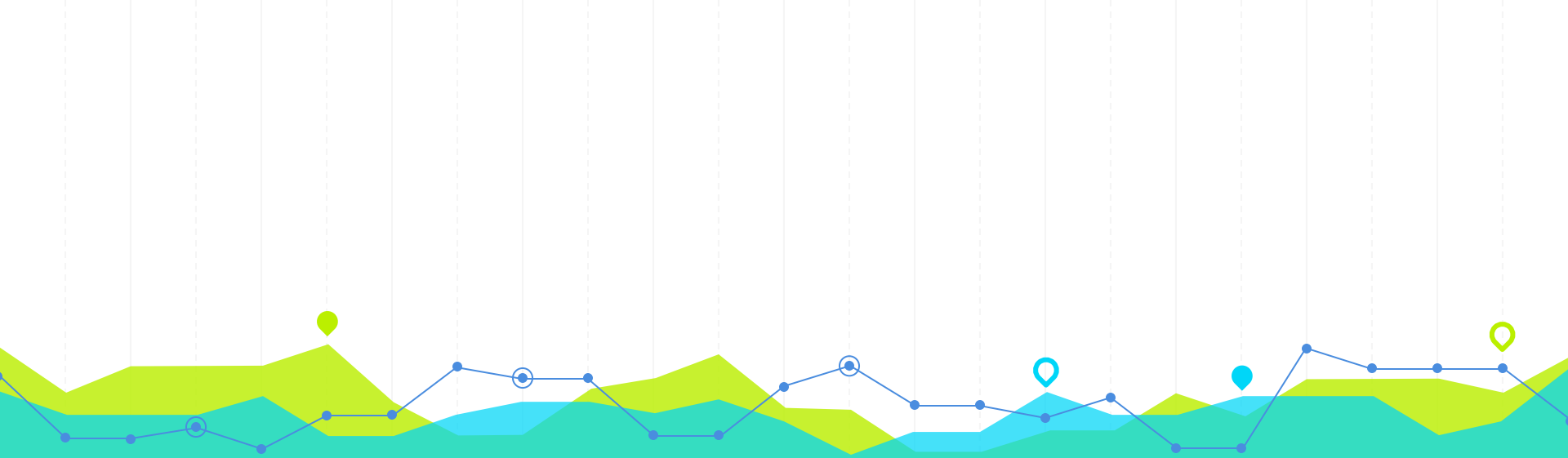


Group C

Professional groups

Project groups



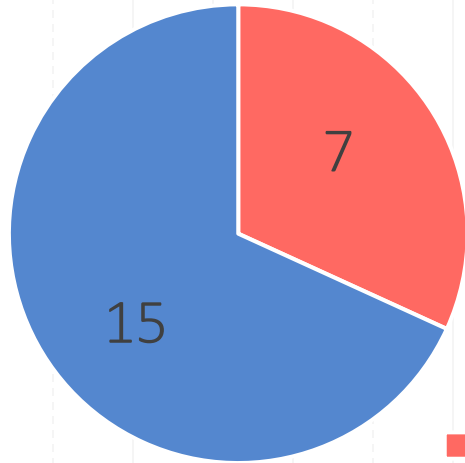


Pedagogical Learning 3

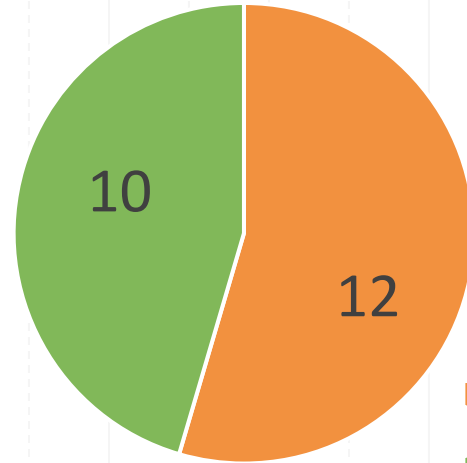
One-on-one interview

● 22 students

● In the 11th week of this course (after mid-term)



■ female ■ male



■ Undergrad
■ master's degree

● Learning expectations

Interview Questions and Answers		Respondents	
1. What was the reason for taking the course?		22	
Possibility of developing a design proposal to be accepted by government	4	18%	
Interested in Nanjichang community	6	27%	
Interested in structural retrofit, urban renewal and green buildings	11	50%	
Interdisciplinary cooperation	11	50%	
Hands-on project	8	36%	

● Learning gains and difficulties

Interview Questions and Answers		Respondents	
2. What did you gain in this course?		20	
Futures thinking	6	30%	
Self-learning	1	5%	
Understanding space planning and urban renewal	4	20%	
Retrofitting Design of Building Structures	5	25%	
Interdisciplinary communication	11	55%	
Breaking away from old thinking	4	20%	
3. What difficulties did you have in this course?		17	
Short working time	1	6%	
Division of work	3	18%	
Lack of prior knowledge	4	24%	
Different opinion from different teacher	1	6%	
Interdisciplinary communication	11	65%	

● Course design

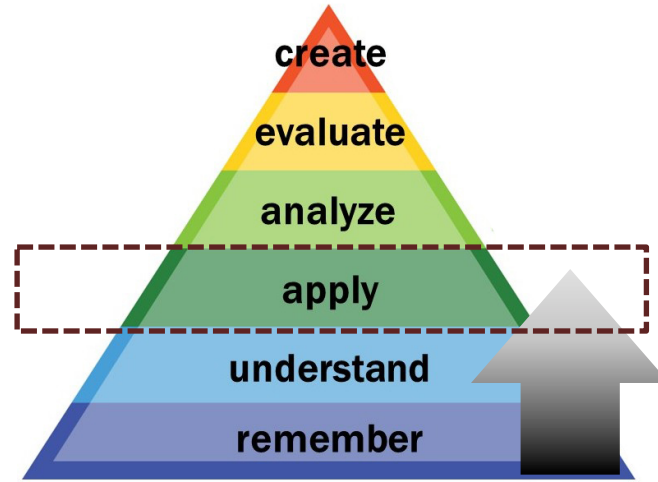
Interview Questions and Answers		Respondents	
4. What are the useful course design?		15	
	Grouping by professional fields before grouping for final projects	2	13%
	Pre-course workshop	3	20%
	Additional courses	6	40%
	Interdisciplinary cooperation	6	40%
	Field work	1	7%
	Guest speeches	3	2%
5. What are the useless course design?		14	
	Grouping by professional fields	7	50%
	Difficulties in applying futures thinking	5	36%
	Excessive time spent on deliberation in earlier stages of the course	3	21%
	Guest speeches	4	29%

Brief discussions from students' responses

- Interdisciplinary communication



- Practical application of futures thinking



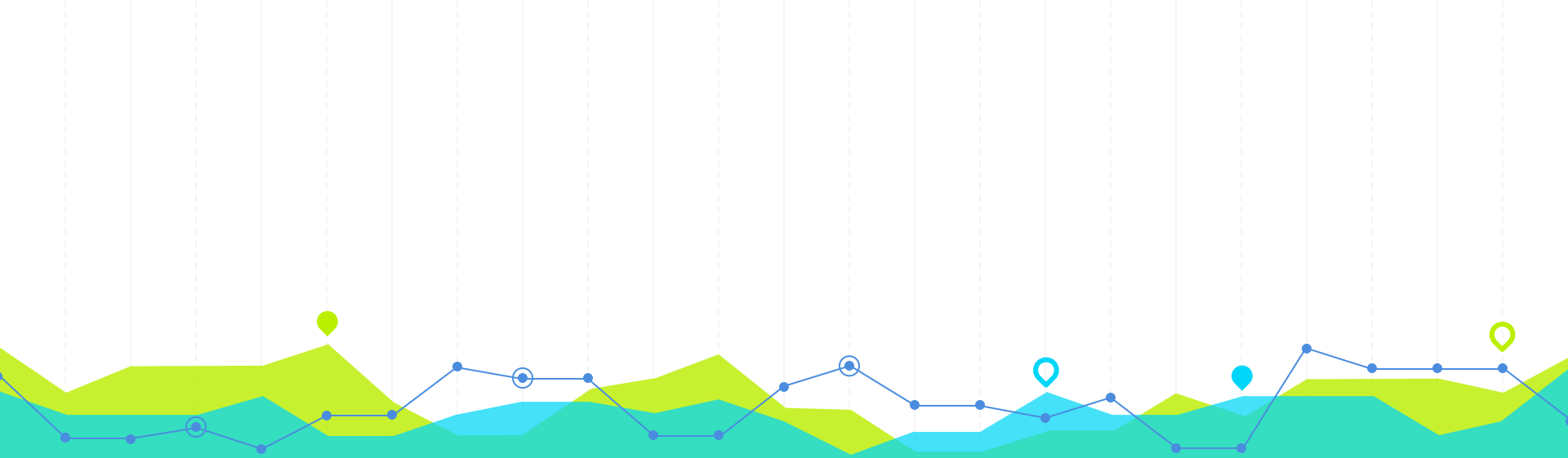
Bloom's taxonomy

- Interactions with guest speakers



Reflections from Teachers

- Teach to enhance students' communication skills ?
(Balance?)
- Synchronize course credit hours?
- Assent to the gov't urban regeneration policies?
- Balance the ratio of students from different fields in a group?
- Teach engineering students to think differently?



Conclusion **4**

Results after course

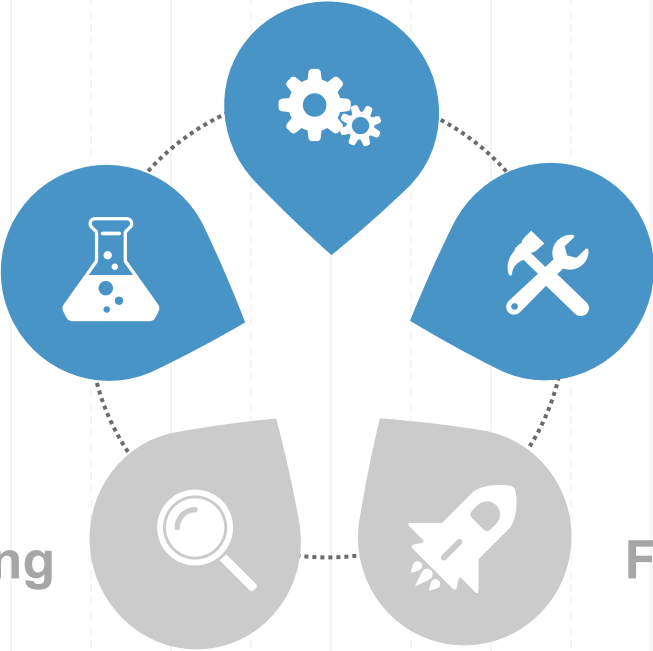
Interdisciplinary Teamwork

Emerging Technologies

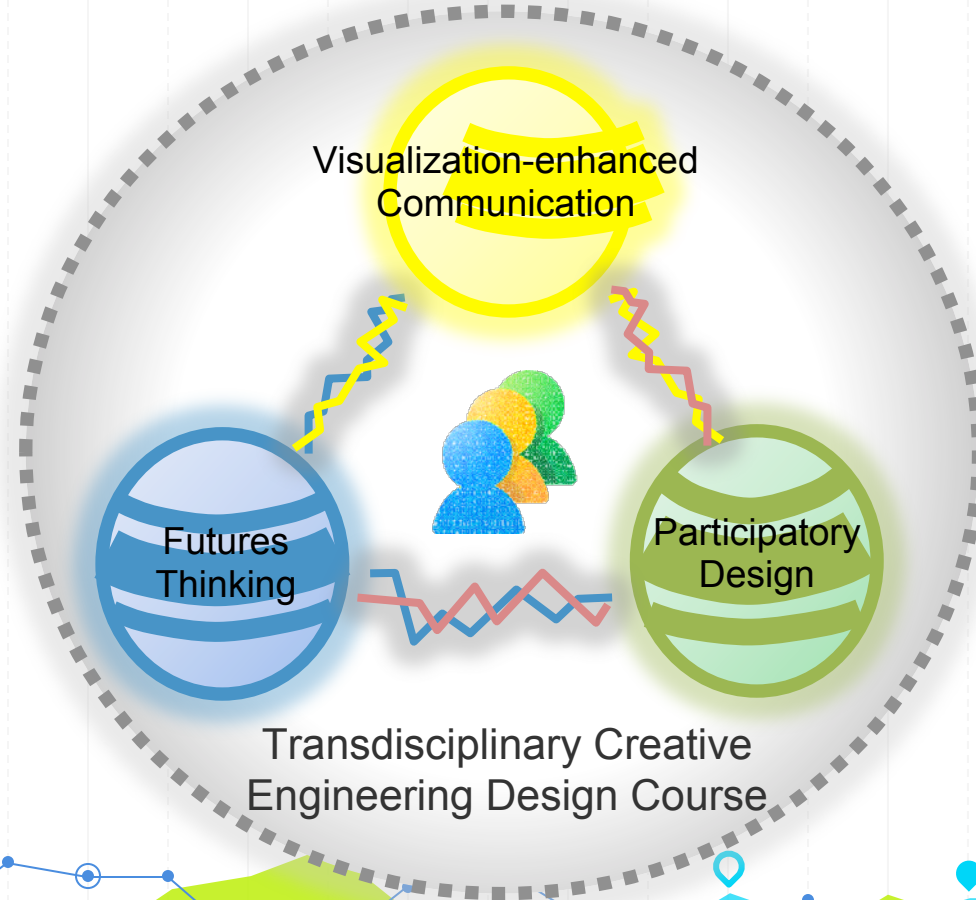
Problems Solving

Creative Thinking

Futures Thinking



New course
in
D-School@NTU



THANK YOU!

Questions?

