

An Innovative Integration of Online and Traditional Teaching in International Cooperative Courses

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What is international cooperative course?



Professional
courses in
English

Education
travel
cooperation

Sino foreign
joint
education

High-quality
undergraduate
/ graduate
studies

International
workshops



Teaching
system
innovation

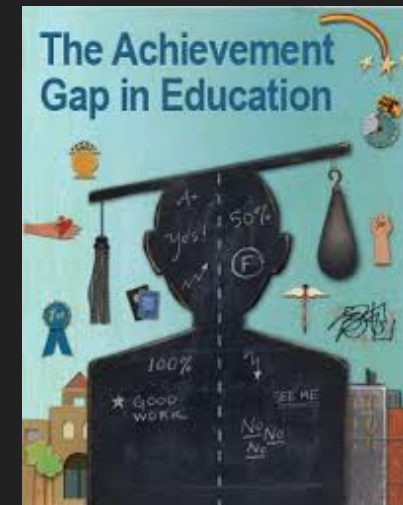


International
academic
exchange
forum



Barriers

- Language
- Culture
- The gap between the instructors' expectations and students' competencies



Course Type

- Undergraduate level
- Graduate level
- Professional seminar






Collaborative Institutes

- Auburn University
- Ocean University of China
- Qufu Normal University
- Tianjing Huanhu Hospital
- Beijing University of Civil Engineering and Architecture



Six Cooperative Courses

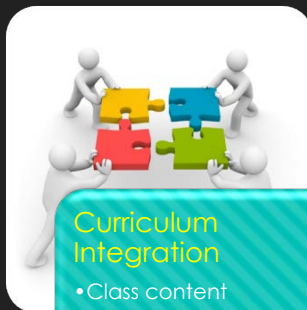
Class	Type	Level	Enrollment	Hours	Cooperation
Cell Biology	Elective	Undergraduate, senior-level	40	36	Bilingual, online + traditional 
Marine Biology	Required	Undergraduate, senior-level	> 50	36	English, online + traditional 
Evolutionary Biology	Elective	Undergraduate, senior-level	120	24	English, traditional
General Biology	Required	Undergraduate, entry level	10	36	English, traditional
Pharmacology	Required	Undergraduate, senior	100	36	Bilingual, online + traditional 
Clinical Pharmacy Seminar	Required	Graduate / Professional level	8	10	English, online

Key Points of Success



Course Planning

- Course schedule
- Location
- Online class planning



Curriculum Integration

- Class content
- Class structure
- Teaching strategies
- Assessments



Teaching Implementation

- Online teaching
- Foreign professor teaching
- Local professor teaching
- Technical support
- TAs



Learning Assessment

- Formative
- Summative

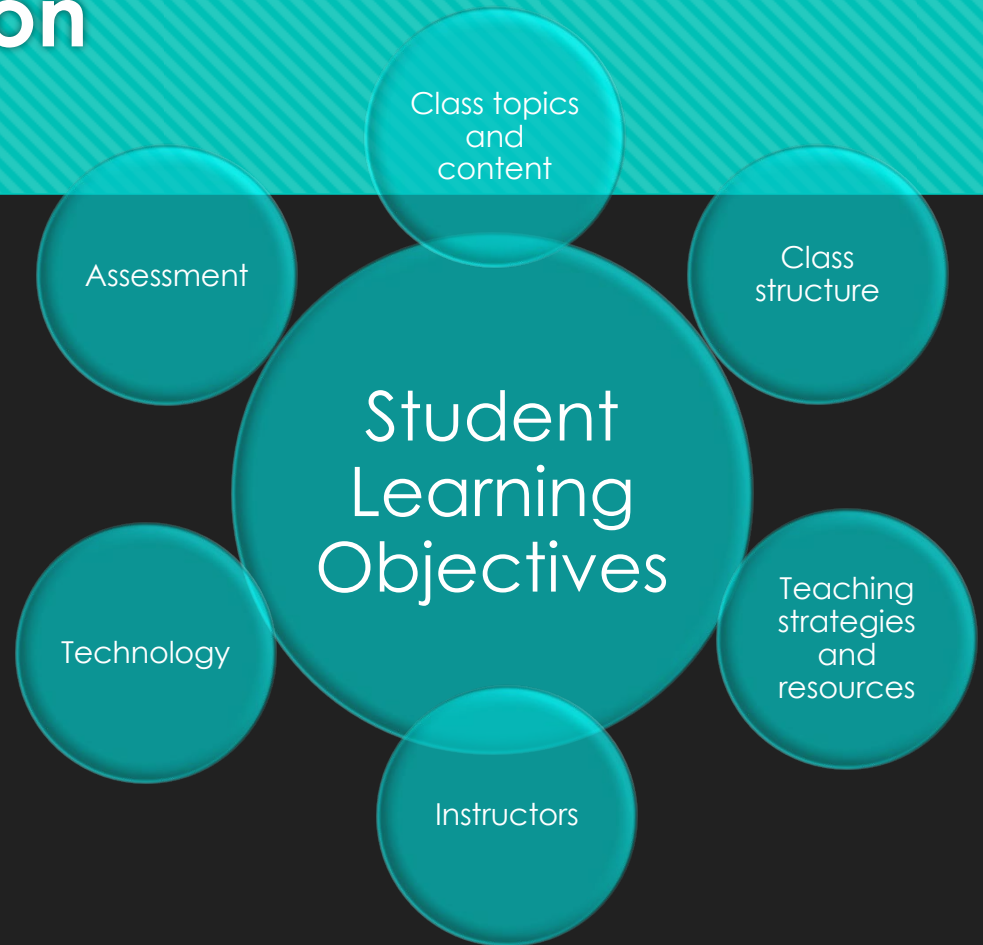
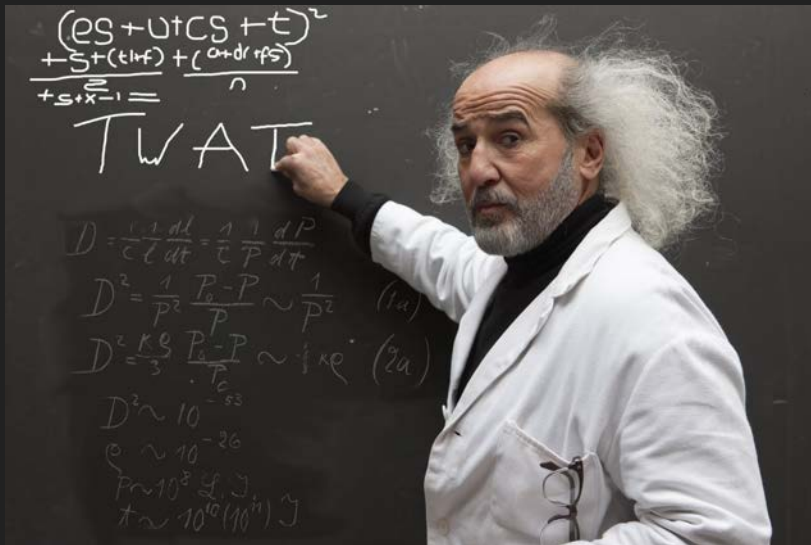


Curriculum Internationalization

- Coursework transforming with international elements
 - Technology
 - Instructors
 - Pedagogy
- Global knowledge and awareness
- Cross-cultural competence



Curriculum Integration



Benefits of Curriculum Integration and Internationalization

- For students:
 - Improving students' learning motivation and class participation
 - Helping them to overcome language and culture barrier.
 - Extending students' understandings about the real world and help them to adapt to the diversity.
 - Introducing students to a wide range of career options and opportunities.
 - Connecting students and their learning to the larger community.
- For teachers:
 - Allow the flexibility of curriculum and teaching
 - Offer teachers a way to better assess student's learning and potential ability.

Class Structure

Class
preparation

- Curriculum integration
- Study materials delivery

Foreign
professor
teaching

- Online class teaching
- Traditional class teaching
- Formative assessment



Assessment for
foreign
teaching

- Summative assessment



Local
professor
teaching

- Local professor teaching

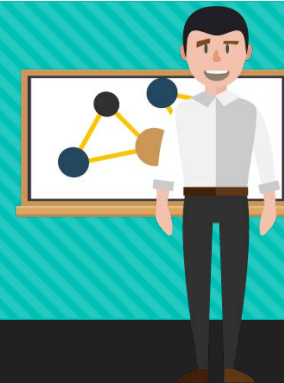


Assessment for
the whole
course

- Summative assessment



Teaching strategies



- Overcome language and culture barrier
- The interactive pedagogy of active learning
- TAs



Students Preparation

- Preview note
- Textbook / chapter reading
- Chapter objectives
- Online classes
- Pre-class assessment



What is a C-value?

mass of all nuclear chromosomal DNA
(regardless of ploidy)
in *picograms* (1 pg = 10^{-12} g)

	C value (pg)	Chromosome number
<i>Homo sapiens</i>	3.50	46
<i>Pan troglodytes</i>	3.76	48
<i>Canis lupus</i>	2.81	78
<i>Rattus norvegicus</i>	3.05	42
<i>Bos taurus</i>	3.70	60
<i>Equus caballus</i>	3.15	64

1 pg DNA = 978 Mbp = 9.78×10^8 bp

Greilhaber et al. 2005. *Ann Botany* 95:255-260.
<http://dx.doi.org/10.1093/aob/abj051>

<http://www.genomesize.com>

Chat

From Yang Wang to Everyone: nuclei

From Lily Ji to Everyone: DNA

From Jiding to Everyone: Ribosome

From Andy-B to Everyone: cell membrane

From Harry/Jianghui Lu to Me: (Privately) ribosomes

From Daria: Learning Aa to Everyone: cytoplasm

From Jipin to Everyone: plasma membrane

From Josephine-B to Everyone: Cytoskeleton

From Hsien Hsien Ren to Everyone: mitochondria

From Yinghui Deng to Everyone: cytoplasm

From Kingyu Dai to Everyone: cytoplasm

From Amber to Everyone: Ribosomes

From Amy: Kingyu Wang to Everyone: cytoskeleton

From Pitter: Shua Qian to Everyone: plasma membrane

From Wilma-Li Lu to Everyone: cytoskeleton

From Josephine-B to Everyone:

To: Harry/Jianghui Lu (Privately) More...

Type message here...

Learning Assessments

Formative – monitoring student learning

- Knowledge-based assessments
- Motivation survey
- In-class Q&A interaction

Summative - evaluating student learning

- A small symposium
- A final exam
- A self-Efficacy survey

Evaluation of the Importance of Online Classes

○ Course assessment —Knowledge-based

Before online classes

Ocean University of China
Cell Biology
Richard Paul Serrano, Ph.D.

Course assessment questions (online portion only)

1. In terms of structure and function, what is a gene?

Is the messages on the DNA.

2. What, exactly, is evolution?

It's a process of changing.

3. What do we really mean when we say that two organisms are related?

They have the same the same.

4. What kind of organism do we think that LUCA is?

Virus.

5. What two ideas unify all of biology?

The cells and their functions.

6. How many molecules of DNA are in one chromosome?

17.

7. What is a living system?

They can do some activities.

8. What structures are common to all cells?

cell wall
cell
ribosome

9. What functions are common to all cells?

reproduction.

10. What are the three major branches of the phylogenetic tree of life?

DNA
protein
Gene.

11. What test could you perform to determine whether two organisms are related?

the test of gene . protein

12. What are the five (5) major events in Earth's evolutionary history?

The deep "flood" was prevented.
they discovered the structure of DNA.

13. What are the physical carriers of the usable energy in a molecule?

14. How do we justify spending so much money and time studying, as organisms?

15. Why is it important to students of biology to understand the proper electron?

It's based on biology

16. What happens when any two molecules "bind" to each other?

they can produce another molecules, or they will be a
lower molecules

17. What three (3) characteristics of molecules are important in any interaction between molecules?

18. What kinds of interactions determine the precise shape of a molecule?

19. What is one structural difference between prokaryotic and eukaryotic cells?

cell ~~the~~ nucleus

20. What physical phenomenon is responsible for holding phospholipids together in a bilayer?

21. Name all the structures in a plant cell that hold genetic information.

cell ~~the~~ nucleus
Glu .

22. Why are yeast are better experimental models of human cells than are green algae?

They have little impact on human cells.

After online classes

Ocean University of China
Cell Biology
Richard Paul Serrano, Ph.D.

Course assessment questions (online portion only)

1. In terms of structure and function, what is a gene?

gene is a double helix structure
A sequence of nucleotides and
Change of over generations

2. What, exactly, is evolution?

Change of over generations
What do we really mean when we say that two organisms are related?

4. What kind of organism do we think that LUCA is?

A cell.

5. What two ideas unify all of biology?

genetics and evolution

6. How many molecules of DNA are in one chromosome?

1.

7. What is a living system?

Only a cell can
do it alone
It is really a
cell membrane
cytoplasm
ribosomes
nucleus

8. What structures are common to all cells?

9. What functions are common to all cells?

Basic structural, functional, and regulatory units
of all human living organisms.
Building blocks of life.
plasma membrane, cytoplasm, nucleus,
mitochondria, golgi apparatus, lysosomes

10. What are the three major branches of the phylogenetic tree of life?

animalia
plantae
fungi

11. What test could you perform to determine whether two organisms are of the same species?

They have the same genes.
We can search their gene codes. If not
we can call two organisms are of the same

12. What are the five (5) major events in Earth's evolutionary history?

I don't know the answer to this question
but I must write something on this paper.
how, I'm really interested on the history!

13. What are the physical carriers of the usable energy in a molecule?

Band.

14. How do we justify spending so much money and time studying, as organisms?

Because we can't see human for our studies
to our laws. So we must study model
search human.

15. Why is it important to students of biology to understand the properties and electron?

Because properties and behavior of objects
for our future studying. They play important

16. What happens when any two molecules "bind" to each other?

There are some chemical they interact between two molecules.
They can communicate with each other.

17. What three (3) characteristics of molecules are important in any interaction between molecules?

Having different chemical
They can interact with each other.

18. What kinds of interactions determine the precise shape of a molecule?

The same gene codes.
Electrostatic interaction.
Hydrophobic interaction.
Hydrogen bond.

19. What is one structural difference between prokaryotic and eukaryotic cells?

Sexotic membrane.
Nucleus.

20. What physical phenomenon is responsible for holding phospholipids together in a bilayer?

hydrophobic interaction and hydrogen bond

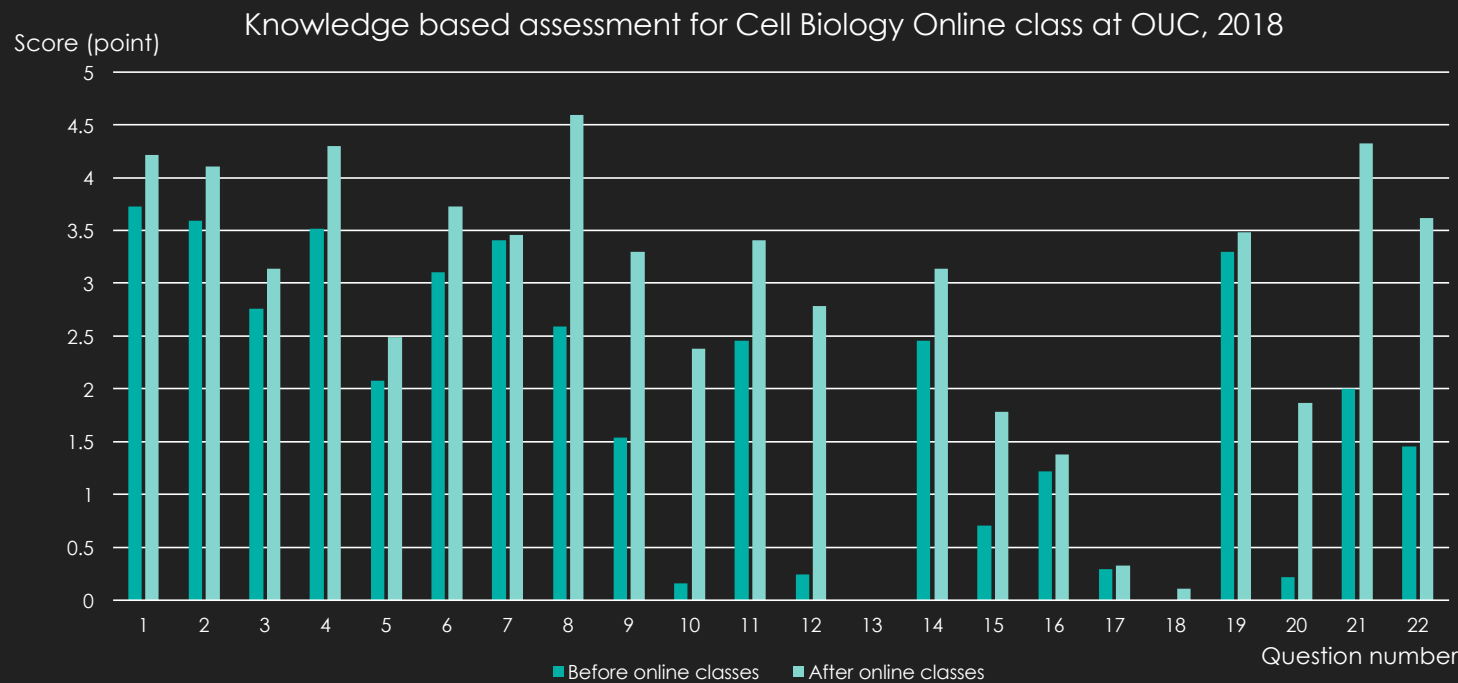
21. Name all the structures in a plant cell that hold genetic information.

Ribosome, Mitochondrion, chloroplast.

22. Why are yeast are better experimental models of human cells than are green algae?

Small
of genetic background is clear.
It is easy to do something on yeast.

Evaluation of the Importance of Online Classes



- 22 questions
- Calculate average score per question
- $p < 0.01$

Evaluation of the Importance of Online Classes

Survey after the first online class

1. Are you interested in online classes?

2. How much did you get from the first online class?

3. Is the preview note helpful?

4. Can you make sure to attend the online class on time?

5. Is your Wifi good during the online class?

6. Did you interact with the instructor during the first online class?

“细胞生物学”国际合作课程教学效果反馈表（一）

亲爱的同学：

你们好！本学期“细胞生物学”课程采取中国海洋大学和美国奥本大学国际合作共建的方式进行。外教部分包括开课前期 online class 和外教面授相结合。引进先进的教学理念和教学方法，为同学们开拓国际视野，提高英文能力、沟通能力、表达能力、思考能力提供了良好的平台。为了保证教学质量和效果，我们需要了解同学们的需求和建议。请真实仔细填写以下内容，谢谢大家的配合与支持！（请在相应选项下划对勾）

1. 你对 online class 感兴趣吗？（五级为兴趣度满级）

A 一级 B 二级 C 三级 D 四级 E 五级

0 3 10 16 5

2. 第一次 online class 你听懂了多少？

A 20%以下 B 20-40% C 40-60% D 60-80% E 80%以上

3 11 11 9 0

3. 你认为 preview 外教课前资料有帮助吗？（五级为帮助度满级）

A 一级 B 二级 C 三级 D 四级 E 五级

0 1 3 14 16

4. 你能保证准时上课吗？

A 完全能保证 B 大部分课能按时上 C 大部分课不能按时 D 时间完全冲突

33 0 0 1

5. 网络是否稳定流畅？（五级为流畅度满级）

A 一级 B 二级 C 三级 D 四级 E 五级

1 1 10 17 5

6. 你在第一次课里用语音发言或用文字形式回答有价值的问题了吗？

A 发言多次 B 发言一次 C 只通过文字多次 D 只通过文字一次 E 一次也没有

0 0 0 5 29

如果没有发言，请回答主要原因是什么？

原因：

① 英语水平限制：A. 有些问题听不清，口语表达能力差，听不懂老师在讲什么

B. 英语水平低，需要查单词才能表达或者不知道问题该怎么用英语表达

C. 对相关领域的英语不熟悉

D. 理解不到位

8. 课堂上教师的风格，不能只注重英文教学
- ① 心理因素：A. 害怕英文听不懂
- ② 基础知识：A. 英文基础薄弱提出有问题，耽误上课
- B. 学习困难
- C. 害怕英文听不懂
- ③ 其他因素：A. 第一次课，同学们没有提出任何问题，第一次课是老师和学生的熟悉
- B. 没有良好环境
- C. 没有良好习惯

9. 教授的教学方式你认为如何？

总体感觉不错

优点：1. 讲课风格幽默，十分有趣，易懂，易懂，激发了同学们的学习热情

2. 资料准备充分，通过资料帮助同学们理解所学内容，大大提升了上课的效率

3. 讲解认真

建议：1. 讲课太快，有些内容跟不上

2. 有一些同学觉得课程内所需的时间太多，建议 online class

3. 希望同学们能多参与讨论

4. 课程内容太多，跟不上

5. 网络卡的时候，ppt 对不上老师所讲的内容

6. 教授的教学内容信息量非常大

7. 希望同学们能多参与讨论

8. 希望同学们能多参与讨论

9. 希望同学们能多参与讨论

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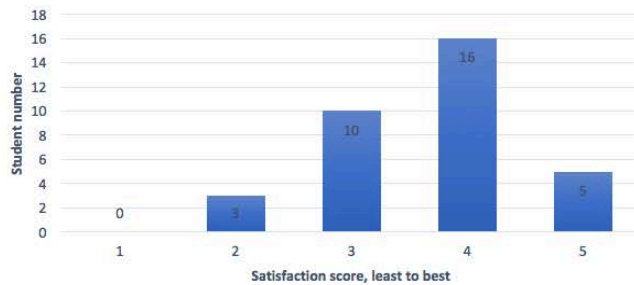
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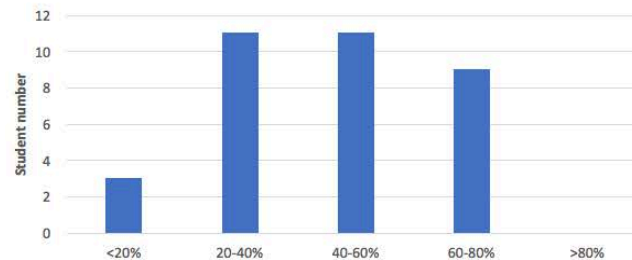
Evaluation of the Importance of Online Classes

○ Improve students' motivation and interests

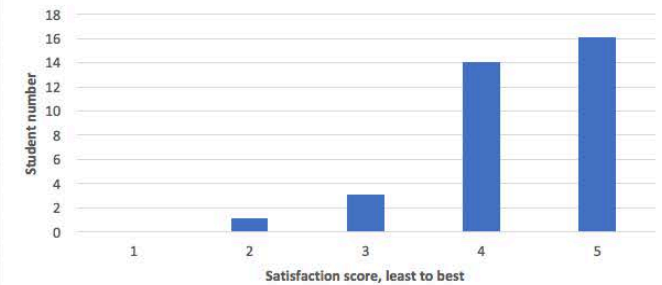
1. Are you interested in online classes?



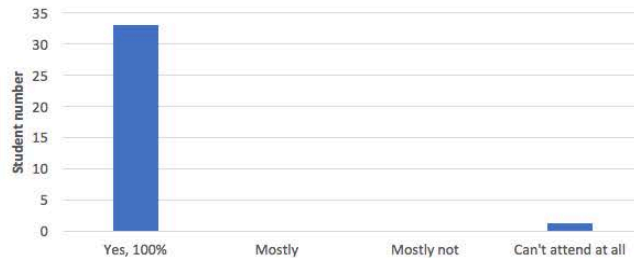
2. How much did you get from the first online class?



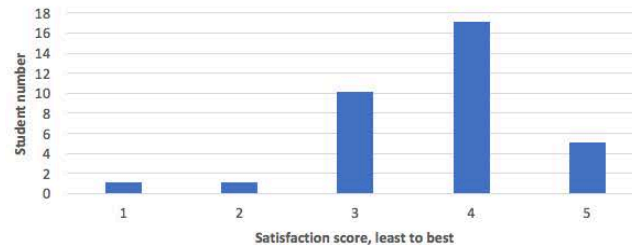
3. Is the preview note helpful?



4. Can you make sure to attend the online class on time?



5. Is your Wifi good during the online class?



6. Did you interact with the instructor during the first online class?



Evaluation of the Foreign Teacher's Classes

- A small symposium



Preliminary Results

- Engage students in:
 - class preparation
 - interests
 - study motivation
 - strategies for learning
 - involvement of some in-class activities.
- Improve receptivity and overcome the barriers of language and culture
- Improve learning outcomes.
- Increase in student interest and an improvement in long-term performance in upper level courses.

International Cooperative Course as a trend

- An emerging trend in high level education in China
- An innovative pedagogy and course framework
- An effective module to enhance class internationalization as well as the global collaborations of professional courses.



International Cooperative Course as an issue

- Teacher cooperation
- Curriculum re-design
- Class time coordination and re-scheduling
- Effectiveness of online classes
- More Effective assessment strategies
- Finding qualified professors



Acknowledgement

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 - Beijing University of Civil Engineering and Architecture
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- OUC undergraduate Teaching Quality and Teaching Reform Fund

