

# Optimal Teaching Mix in Blended Team-Based Learning (BTBL)

A longitudinal study  
of  
The School of Professional and Continuing Studies (SCS)

Mr. Louis LAM  
Email: [louis.lam@cuhk.edu.hk](mailto:louis.lam@cuhk.edu.hk)  
Tel: 2781-0114

## Agenda

- Introduction
  - The purpose of this study
  - Victoria University (VU)
    - Professional Development 1 (PD1)
  - Blended Team-Based Learning (BTBL)
    - Optimal teaching mix
- Research
  - questions, aims and objectives
  - methodologies and analysis
  - Results and findings
  - Conclusion
  - Limitation
- future plan and research



## Introduction

- The purpose of this study:
  - To examine whether the **Modified Blended Team-Based Learning (BTBL)** developed by Victoria University (VU) can be generalized and applied in Hi-Diploma (HD) course of the School of Professional and Continuing Studies (SCS).
  - Share with colleagues
    - The research findings
    - BTBL teaching experience



## Introduction

- Victoria University (VU) Australia
  - One of SCS business partners
  - Co-operates with SCS jointly introduce top-up degree programme in Hong Kong.<sup>1</sup>
  - Introduced a new series of courses, called Professional Development (PD1, PD2, PD3), in the top-up degree programme in fall 2009.



## Blended Team-Based Learning (BTBL)

- The PD1 course is designed in form of BTBL including a number of carefully-chosen class activities (optimal teaching mix) for the propose of:

- Acquiring knowledge
- Identifying personal attributes
- Developing professional skills.<sup>1</sup>



1. <http://www.vu.edu.au/units/bfp1001>



## Blended Team-Based Learning (BTBL)

- Optimal Teaching Mix
- Class activities (assessment):
  - Readiness Assurance Test (RAT)<sup>1</sup> [BC, IC][G, I]
  - Critical Reading and Writing [BC, IC][I]
  - Self-reflection [AC][I]
  - Short case study [IC][G]
  - Long case study [BC, IC, AC][G]
    - presentation & report

BC = Before-class preparation

G = group activity

IC = In-class

I = individual activity

AC = After-class



<http://teambasedlearning.apsc.ubc.ca/wp-content/uploads/demo-rat.pdf>



## Blended Team-Based Learning (BTBL)

- Student is required to:
  - Work in team most of the time except individual activities
  - Be punctual and well time-managed as all the activities have tight schedule
    - Mark will be deducted for late submission
    - Zero mark for anyone absent in class activities
- Free-rider problem in teamwork
  - Peer evaluation
  - Teacher evaluation of individual performance in teamwork



<http://teambasedlearning.apsc.ubc.ca/wp-content/uploads/demo-rat.pdf>



## Background

- The HD of Corporate and Business Information System (CBIS) students are chosen to participate in this study.
- One of their courses, 'Corporate Governance and Ethics' (CGE), is taught using modified BTBL
  - Modified → localized to HD students



## Background

- The reason of choosing CGE course
  - The concept of CGE is relatively **profound** to HD students
  - **Traditional Teaching Learning (TTL)** approach was found **difficult to achieve** desired learning outcome, i.e.
    - To demonstrate and apply the knowledge of CGE
    - To evaluate and criticize the CGE of an enterprise



## Modified BTBL

A quick lecture is delivered teaching student CGE concept before class activities

Class activities	BC	IC	AC	G/I	From
Readiness Assurance Test (RAT)	x	x		IG	VU
Critical Reading and Writing	x	x		I	VU
Self-reflection			x	I	VU
Short case study [+Poster presentation]		x		G	Modified
Long case study [presentation & report]	x	x	x	G	VU
Online presentation [video recording]		x	x	G	New
Short quiz	x	x		I	New

BC: Before-class preparation  
IC: In-class  
AC: After-class

G: Group activity  
I: Individual activity

VU: Victoria University  
New: newly added  
Modified: VU + new



## Research questions

- Major research question
  - Can the modified BTBL approach be generalized and applied in the HD course of SCS in improving the learning outcome?



## Research aims

- To show that the Modified BTBL be generalized and applied in the HD course of SCS in improving the learning outcome.



## Research objectives

- To show that the learning outcome of SCS HD course is influenced by the individual class activity [i] of modified BTBL, where class activity [i] is
  - Readiness Assurance Test (RAT)
  - Critical Reading and Writing
  - Self-reflection
  - Short case study
  - Long case study
  - Online video presentation
  - Quiz
- To show that the learning outcome of SCS HD course is influenced by the BTBL teaching mix of class activities



## Research objectives

- Testing hypothesis [i] for  $i = 1 - 7$ 
  - **H0 (Null hypothesis):** The learning outcome is not influenced by individual class activity [j]
  - **HA (Alternative hypothesis):** The learning outcome is positively influenced by individual class activity [j] compared to traditional teaching learning (TTL)
    - where class activity [j]
      - [A1] Readiness Assurance Test (RAT)
      - [A2] Critical Reading and Writing
      - [A3] Self-reflection
      - [A4] Short case study
      - [A5] Long case study
      - [A6] Online video presentation
      - [A7] Quiz



## Research objectives

- Testing hypothesis 8
  - **H0:** The learning outcome is not influenced by BTBL teaching mix of all class activities.
  - **HA:** The learning outcome is positively influenced by BTBL teaching mix of all class activities compared to traditional teaching learning (TTL).

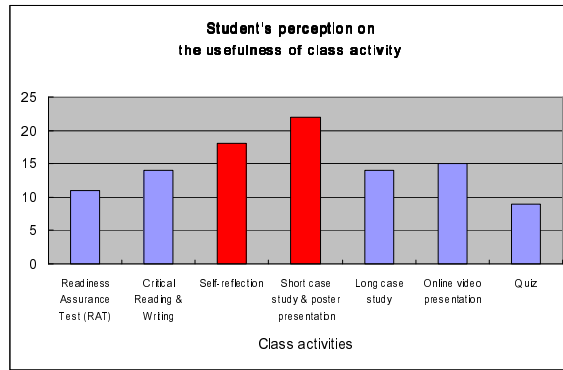


## Research methodology

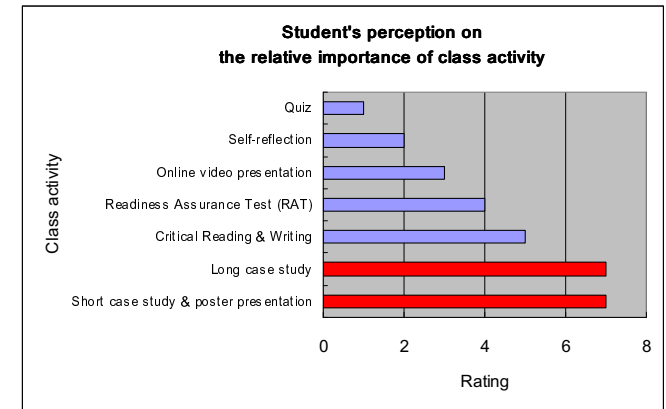
- Sample size
  - 30 students
- Sampling method
  - Convenient sampling
- A longitudinal study (quantitative)
  - The students attend two courses of different teaching learning approaches, i.e. BTBL and TTL
- Testing instrument
  - An attitude survey questionnaire contains close-ended questions (Likert Scale) and open-ended questions
- Data analysis
  - Step 1: chi-squared test
    - → test significant relationship
  - Step 2: z-statistics test
    - → test positive relationship



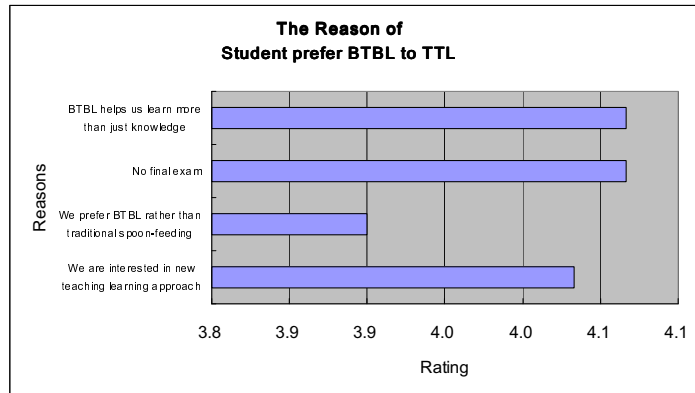
# Research results



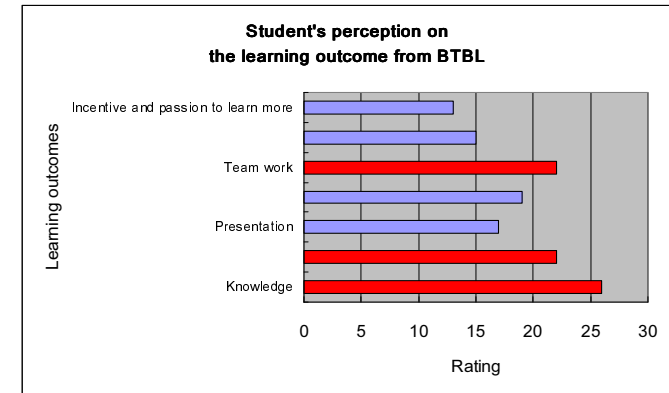
# Research results



# Research results



# Research results



## Data analysis [step 1]

- Chi-squared test ( $X^2$ )
  - To test whether there is a significant relationship between BTBL teaching mix and learning outcomes



## Data analysis [step 1]

Chi-squared value	A1	A2	A3	A4	A5	A6	A7	Total
Knowledge	2.184	0.977	0.843	0.753	0.395	2.175	3.985	11.311
Communication and interpersonal skill	0.120	0.435	1.226	0.301	0.072	1.068	3.166	6.387
Teamwork and collaboration	1.413	1.301	0.821	1.487	3.099	1.062	3.658	12.841
Time management	0.297	0.034	0.354	0.001	0.000	0.036	0.000	0.722
Incentive and passion to learn more	0.684	0.039	2.908	0.552	0.702	0.456	0.034	5.374
Others	0.197	0.857	2.083	0.088	1.045	0.001	4.831	9.103
<b>Total</b>	<b>4.895</b>	<b>3.643</b>	<b>8.234</b>	<b>3.180</b>	<b>5.314</b>	<b>4.798</b>	<b>15.674</b>	<b>45.737</b>

- The calculated Chi-squared value:
  - $X^2_{[calc]} = 45.737$  with 30 degree of freedom
- Area in upper tail
  - $X^2_{[5\%]} = 43.77 < X^2_{[calc]} < X^2_{[2.5\%]} = 46.98$



## Data analysis [step 1]

- The decision is:
  - Reject  $H_0$  (null hypothesis) that there is no association between BTBL and learning outcome.
- The conclusion is
  - There is a **significant association** between the BTBL teaching mix and learning outcomes **at the 5% level of significance.**



## Data analysis [step 2]

- z-statistics test
  - To test whether the learning outcomes are positively influenced by **individual class activity** compared to traditional teaching learning (TTL)
  - To test whether the learning outcomes are positively influenced by **BTBL teaching mix of all individual class activities** compared to traditional teaching learning (TTL)



## Data analysis [step 2]

z-statistics test	A1	A2	A3	A4	A5	A6	A7	Overall
BTBL Mean	3.43	3.70	2.87	4.20	4.20	2.97	2.37	3.39
BTBL SD	2.06	1.49	2.21	1.63	1.79	2.09	2.25	2.03
TTL Mean	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
z-stat [calc]	3.01	5.15	1.41	6.39	5.82	1.75	0.16	2.94
z-stat [1%]	2.33	2.33	2.33	2.33	2.33	2.33	2.33	2.33
Hypothesis to be accepted	HA	HA	H0	HA	HA	H0	H0	HA
z-stat [5%]	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65
Hypothesis to be accepted	HA	HA	H0	HA	HA	HA	H0	HA

- z-stat<sub>[calc]</sub>[A3, A6, A7] < z-stat<sub>[1%]</sub>
  - Decision: Reject HA
- z-stat<sub>[calc]</sub>[A1, A2, A4, A5] > z-stat<sub>[1%]</sub>
  - Decision: Reject H0
- z-stat<sub>[calc]</sub>[Overall] > z-stat<sub>[1%]</sub>
  - Decision: Reject H0

- [A1] Readiness Assurance Test (RAT)
- [A2] Critical Reading and Writing
- [A3] Self-reflection
- [A4] Short case study
- [A5] Long case study
- [A6] Online video presentation
- [A7] Quiz
- BTBL – Blended Team-Based Learning
- TTL – Traditional Teaching Learning



## Data analysis [step 2]

- The conclusion:
  - The learning outcomes are **not influenced** by individual class activity A3, A6, A7.
  - The learning outcomes are **positively influenced** by individual class activity A1, A2, A4, A5 compared to traditional teaching learning (TTL)
  - The learning outcomes are **positively influenced** by BTBL teaching mix of all individual class activities compared to traditional teaching learning (TTL) at the 1% level of significance.



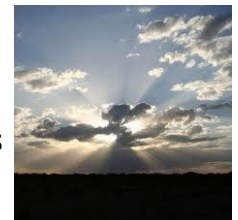
## Conclusions

- The modified BTBL teaching mix is applicable in SCS HD course
  - +ve influence on the learning outcome
- Ultimately, students can, not only be benefited from knowledge acquisition, but also **apply** the knowledge and **reflect themselves**.
  - According to SOLO Taxonomy (Biggs & Collis), student responses reach 4th or 5th SOLO level, i.e. “Logically related answer” or “unanticipated extension”, **if and only if he/she is engaged in all the class activities of BTBL**



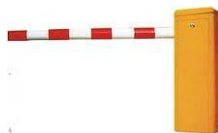
## Contribution of research findings

- The research opportunities, for example:
  - The issues of BTBL: free-riders, quality assurance, classroom culture.
  - The BTBL instructional design and its alignment with the learning outcome as perceived by students
  - The impacts of IT on BTBL.
- Share with colleagues the innovative BTBL



## Limitations of research

- Small sample size
  - not representative
- Research findings based on the student perception only
  - No validation from senior staffs or in-depth interview
- Convenient sampling
  - Non-probability sample method



## Future plan

- The major objective in teaching:
  - to achieve and maximize the learning outcome of students.
- What I need to do as a teacher:
  - Keep examining the **effectiveness** of current teaching approach on HD courses
  - Keep evaluating the **appropriateness** of different teaching approach on HD courses
  - Keep **attending professional development courses** in teaching provided by CLEAR (if time allowed :P)
  - **Exchange the teaching experience** with other institutions like Victoria University Australia
  - Keep **updated from literatures and articles**



## Future research

- Stage 1:
  - A similar study will be carried out for **different courses** in order to test if this BTBL be generalized and needs localization in certain areas.
- Stage 2:
  - A comparison study of the **impact of cloud computing** on traditional teaching learning and BTBL: Is it **complementary** or **redundant** with respect to e-learning software platform?



## Thank you!

- If you have any enquiries, please kindly contact me by email or phone.
- If you are interested in this research, please contact me for details.
- I am looking forward to **any collaborative research opportunities** with you.
- Contact:
  - Email: [louis.lam@cuhk.edu.hk](mailto:louis.lam@cuhk.edu.hk)
  - Tel.: 2781-0114
  - Office: Rm1501, 15/F, Mongkok Learning Centre, 90A Shan Tung Street, Mongkok, Kowloon, HK

