Using Constructivist Learning Environment to Cater for Learning Diversity and Promote Approaches to Learning in an Associate Degree General Elective Subject

Wincy LEE, Ph.D.

The University of Hong Kong

Faculty of Education

8th July 2014

Research context

- Piloted Outcome-Based Learning in an associate degree-level general elective subject:
  - Change in teaching mode
  - Change in curriculum
  - Change in pedagogy
  - Change in assessment
- Gave a blanket name:
  - Constructivist learning environment
- Operationalized the effectiveness of change
  - Students' study approach

Quick Glossary

Surface Approach	Deep Approach
Treating the course seen as unrelated bits of knowledge	Relating ideas to previous knowledge and experience
Routinely memorizing facts and carrying out procedures	Looking for patterns and underlying principles
Focusing narrowing on the minimum syllabus demands	Checking evidence and relating it to conclusion
Seeing little value or meaning in the course or set tasks	Examining logic and argument cautiously and critically
Studying without reflecting on either purpose or strategy	Monitoring understanding as learning progress

Quick literature

- Mixed results regarding the change of study approach through learning environments and such can be attributed to contextual, perceived contextual and students' factor (Baeten, Kyndt, Struyven & Dochy, 2010)

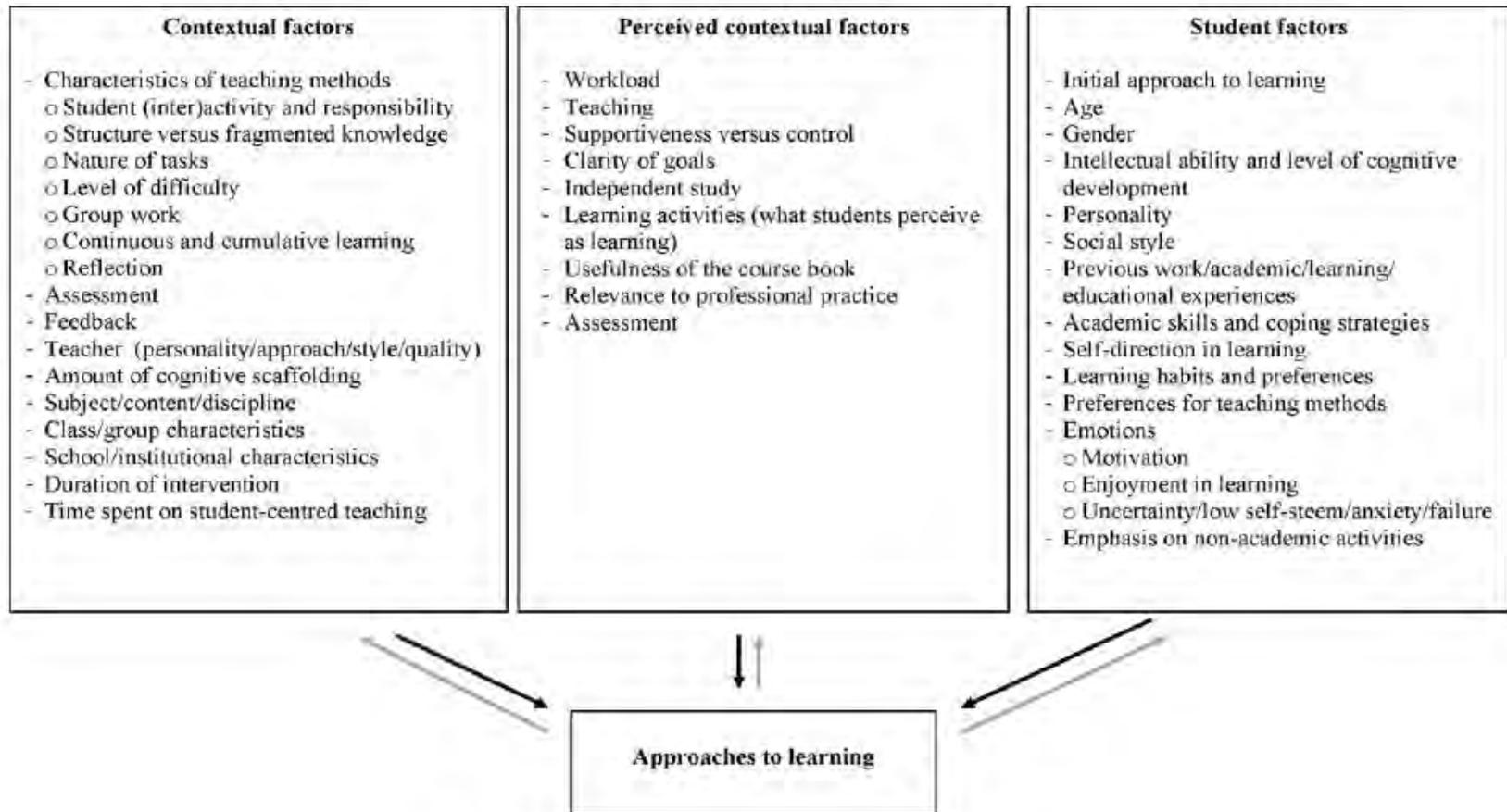| Contextual factors	Perceived contextual factors	Student factors

- Characteristics of teaching methods
  ○ Student (inter)activity and responsibility
  ○ Structure versus fragmented knowledge
  ○ Nature of tasks
  ○ Level of difficulty
  ○ Group work
  ○ Continuous and cumulative learning
  ○ Reflection
- Assessment
- Feedback
- Teacher (personality/approach/style/quality)
- Amount of cognitive scaffolding
- Subject/content/discipline
- Class/group characteristics
- School/institutional characteristics
- Duration of intervention
- Time spent on student-centred teaching
	- Workload
	- Teaching
	- Supportiveness versus control
	- Clarity of goals
	- Independent study
	- Learning activities (what students perceive as learning)
	- Usefulness of the course book
	- Relevance to professional practice
	- Assessment
		- Initial approach to learning
		- Age
		- Gender
		- Intellectual ability and level of cognitive development
		- Personality
		- Social style
		- Previous work/academic/learning/educational experiences
		- Academic skills and coping strategies
		- Self-direction in learning
		- Learning habits and preferences
		- Preferences for teaching methods
		- Emotions
		  ○ Motivation
		  ○ Enjoyment in learning
		  ○ Uncertainty/low self-steem/anxiety/failure
		- Emphasis on non-academic activities

Approaches to learning

Fig. 1. Overview of encouraging and discouraging factors.

Baeten, M. Kyndt, E., Struyven, K. & Dochy, F. (2010). Using student-centred learning environments to stimulate deep approach to learning: Factors encouraging or discouraging their effectiveness. *Educational Research Review, 5,* 243-260.

- Critical constructivist learning environment has been implemented in a secondary school economic class (Fok & Watkins, 2007)

- It was found to be effective in promoting Deep Approach among the group of high achievers

Research Question

- How does a constructivist learning environment cater for learning diversity and foster deep learning in a general elective course?
  - Increase the use of Deep Approach
  - Lessen the use of Surface Approach

The course

- <u>Subject</u>: Social Psychology
- <u>Nature</u>: GE subject (without pre-requisite)
- <u>Duration:</u> 14 weeks
- <u>Class composition</u>:
  - Yr1 & Yr2;
  - Business, English for Business Communication, Engineering, Arts
- <u>Class size</u>:
  - Class 1: 30 students
  - Class 2: 37 students

Change in teaching mode

- Structure and mode:
  - Traditional: 2-hour lecture & 1-hour tutorial on different days of the week
  - New: 3-hour lesson on one day of the week

Change in curriculum

- Traditional:
  - Coverage of chapters and concepts
- New:
  - Identify and re-group big ideas and core concepts across different chapters;
  - Example: concept of self
    - Self-serving heuristics
    - Better-than average, illusory correlation, illusory causation, counter-factual thinking…

Change in pedagogy: Design Principles

Pedagogical design principles based on key findings in learning sciences (Bransford, Brown & Cocking, 2000; Sawyer, 2009):

- – Role of prior knowledge
- – Establishing solid understanding in core ideas
- – Developing metacognitive abilities
- – Supporting collaboration

Change in pedagogy

- Traditional:
  - Lecture & tutorial
- New:
  - Mini-lecture (at most 15 minutes), learning tasks and discussion were interspersed within the three-hour period
  - Examples: Learning task

Measurement

- Study Process Questionnaire (SPQ; Biggs, Kember and Leung, 2002)
  - Beginning of course:
    (Time 1: DA α = 0.71; SA α = 0.65)
  - End of course:
    (Time 2: DA α = 0.78; SA α = 0.66)
- Sample item:
  - Deep Approach: "I find that at times studying gives me a feeling of deep personal satisfaction."
  - Surface Approach: "My aim is to pass the course while doing as little work as possible."

Results
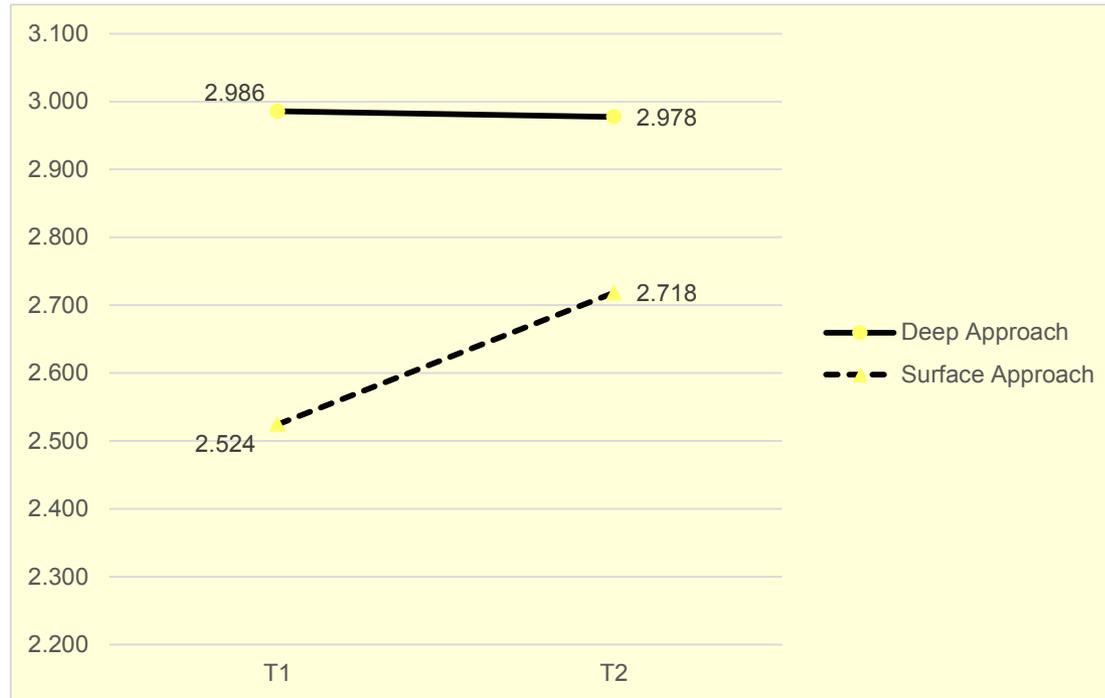
Repeated measure MANOVA showed significant Time effect (Wilks' Lambda=0.839, p=0.016).
Univariate test suggested only change in Surface Approach was significant (F=9.014, p < 0.01)

- Constructivist learning environment promotes SA but not DA??
  - Similar results had been found (Nijuis et al, 2005; Segers et al, 2006)
  - Students were not motivated to begin with

Open-ended feedback (excerpted)

- [The class] can encourage us to have discussion so that we may **understanding [the content] better**.

- During the class, I don't need to [just] sit still and do nothing. There are group discussion, which **makes me more involved in each topic**.

- [The class] is very interactive, it focuses on learning activities during the class**, students can understand the concepts better through participating in the learning activities**.

- …there is a great degree of freedom in answering the questions or doing the assignments when compare other [social science] subjects that I take. I think this **great degree of freedom can stimulate students thinking.**

- …**Encourage us to think of real life examples to test our understanding of concepts.** Very good teaching skills to draw students attention.

- **Knowing** and **understanding** as well as **memorizing** the concepts **are all important.** I'm actively involved in the class, not like other classes just listen and jot notes.

- There was many different activities during each lectures. Therefore, the **three hours lecture can be easily finished and I didn't feel boring.**

Take Home Messages

- Learning diversity has been "teritarized"
  - massification of Higher Education
  - change of curriculum
- The mission of GE instructor:
  - 'Students' last chance to learn the subject matter in the rest of their life…"
  - How to engage them?
    - Designing learning environment with the powerful learning principles can be a highly promising avenue

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