COMPUTER SUPPORTED COLLABORATIVE LEARNING

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Twenty-First Century

KNOWLEDGE AGE

INFORMATION AGE
Changing World, Changing Education
“We are currently preparing students for jobs that don’t yet exist......

using technologies that haven’t been invented......

in order to solve problems we don’t even know are problems yet!”

-- Karl Fisch
What is needed in the changing world and educated citizens?
### 21st Century Education Skills

#### Ways of thinking
- Creativity and Innovation
- Critical thinking
- Problem solving
- Learning to learn
- Metacognition

#### Way of working
- Communication
- Collaboration
- Teamwork

#### Tools of working
- Literacy, information literacy, ICT

#### Living in the world
- Citizenship, life and careers, personal and social responsibility

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**How?**

如何在教育中創新？
如何培養學生的創新能力？

*Source: OECD 2012*
Collaboration
Dialogical Thinking
INNOVATION
EDUCATION REFORM
Overview of the Hong Kong School Curriculum
Keeping ITE in step with curriculum development

IT in Education → Infrastructure → e-resources → e-leadership → ITE4

Curriculum Development
- Learning to learn reform
- New Academic Structure Reform
- Ongoing review and updating across Key Learning Areas

Teacher-centred → Student-centred

Timeline:
- 1998
- 2001
- 2004
- 2014
Facing the 21st century challenge

What does your classroom look like? How does ICT work? Are you supporting students to learn together? How to prepare students for future-oriented learning?
Computer Supported Collaborative Learning
What is computer-supported collaborative learning?

1) What is your experience with learning?

2) What is your experience with collaborative learning?

3) What is your experience with computer-supported learning?

4) What is your experience with learning through collaboration supported by computers?
Computer Supported Collaborative Learning

Learning, Collaboration, Computer

How to promote student learning and learning to learn (sharing, knowledge construction and creation of knowledge) through collaboration (peer interaction, group learning and community processes) supported by technology
How computers can bring students together to learn collaboratively in small groups and in learning communities

Goal

Provide opportunities to support students to learn together through discourse (discussion) for constructing shared knowledge
Collaboration is the next literacy into the 21st Century.

According to Social Constructivism, collaboration is the essence of how we learn, the nature of being human.

“Through others we become ourselves.”

Lev Vygotsky
Benefits of Collaboration (1)

Cooperative Learning

• Higher student motivation

• Development of social, inter-personal and communication skills

• Higher student academic achievement

(Johnson & Johnson, 2009)

Closed-end with known answers
Division of labor on sub-tasks
Knowledge level differ- peer tutoring
Product-based
Benefits of collaboration (2)

Collaborative Learning (Crooks, 1994)

• Articulation of ideas; language; talking and writing to learn

• Co-Construction of Knowledge – elaboration, explanation, negotiation of ideas and extension of thinking

• Cognitive Conflict – Different perspectives lead to disequilibrium and can bring about change

Open-ended problem
Working on solving same task; inquiry-based
Similar knowledge levels
Process-Based
Benefits of Collaboration (3)

Learning Communities

• Sharing with others in a positive & supportive environment

• New idea and knowledge emerge in communities - creativity and Innovation

• Collaboration starts in the classroom but can extend locally and globally; networked and unlimited learning for 21st century learners

Common and shared goals
Diverse expertise
Learning networks
Technology to share knowledge
Learning Theories and CSCL: Changing Theories

- **Behaviorism**
  - Pavlov

- **Humanism**
  - Maslow

- **Cognitivism**
  - Simon

- **Constructivism & Socio-Constructivism**
  - Piaget
  - Vygotsky

**1950s**
- Stimulus & Response
- Rewards & Punishment

**1960s**
- Needs & Feeling
- good

**1970s**
- Storage & Retrieval
- Attention; Memory

**1980s**
- Constructive;
- Social & Collective

**2000s**
**Constructivism & Social-Constructivist theories**

**Cognitive Constructivism**
- Knowledge is constructed
  - Learning depends on prior knowledge
  - Learning involves active engagement, metacognition & reflection

**Social Constructivism**
- Knowledge is constructed socially
  - Learning emerges through interaction
  - Groups and communities

**ICT - Use of tools to extend cognition and collaboration**
Collaborative Learning and Role of Technology
Can Technology Facilitate Learning?

YES
NO
MAYBE
Using Computers in Collaborative Learning

What can computers do in promoting collaborative learning? Affordance (adapted from Jeong & Hmelo-Silver, 2016)

- Share information & resources (but beyond)
- Communicate and interact
- Engage in a joint task (e.g. write paper/project together)
- Joint meaning making (articulation; elaboration; explanation, co-construction)
- Visualize, trace ideas; organize group knowledge
- Reflect, monitor and regulate group processes (self-regulation to co-regulation)
- Develop and build communities. Knowledge creation

Computers help structure learning and support the learning process
CSCL tools/technologies

- Instant messaging
- Email
- Web conferencing (WebCT)
- Blogs (Weblogs)

- Discussion threads and chatrooms
- Wiki's (knowledge network building tools)

http://www.slideshare.net/slackeroo/computer-supported-collaborativelearningfinal?qid=f35d0f04-be48-43bd-af45-a3a9a8446dfc&v=&b=&from_search=5
Using Technology to Engage

- Technical environment
- Cognitive tools
- Blogging, wikis, forums, e-portfolios
- Digital images, video, sound
- Using mobile devices
5. Digital Storytelling

- Session 3 content
- Using Social Media in the Classroom
- This week we will explore the use of social media in the classroom, focusing on platforms like Twitter, Facebook, and Instagram.
- Standards for the English language arts
- Emphasizing the importance of digital storytelling in English language arts classrooms.

Blogging

- Keep in mind:
- A video produced by TeacherTube that provides a clear explanation of what blogging is.
- Storyboard.net's Extended Essay Blog
- This tool can be used to help students organize their ideas, by breaking down the topics into manageable sections. 
- Developed by the English language arts department.

Edmodo

Edmodo is a platform that enables teachers, students, and parents to connect and collaborate online. It provides a secure and collaborative environment for classroom activities, allowing for seamless communication and exchange of resources. It can be used to share assignments, announcements, and assessments, facilitating a more interactive and engaging learning experience. 

- Group activities:
- Group posts:
- Chat feature:

Language 2013:

- Group Posts:
- Chat:
- Group activity:
- Group members:
SE Inquiry Physics Group

by Carol Kwai Kuen Chan  -  Wednesday, 5 October 2016, 10:43 AM

1) SE Weekly Inquiry: Use the observation sheets to help you notice classroom events and reflect on teaching and learning. Write three things you have learned, two teaching strategies you would try out in your future teaching, and one question you have. Please make at least ONE response to your group-mates' sharing and more discussion encouraged as time allowed. There is no need to write very long responses but some interaction is good. Bring the completed observation sheets to Session 2 (Friday) for sharing.

2) General Discussion: After you now have several classes and started SE, you would have some questions on your own and you are most encouraged to start the discussion posing questions and sharing your experience (and resources) and responding to each others in the general discussion forum. Your discussion will also be considered in your course assessment on SE (bonus) and it can also help you with your final portfolio.

[School Experience_October3.docx]

Re: SE Inquiry Physics Group

by Yee Chiu Kevin Chan  -  Wednesday, 5 October 2016, 8:48 PM

(1) 3 things I have learned:-
- Teachers can give praises to a whole group students, not just to individuals. Many of the teachers during the assembly were descriptive in their praises to the entire group of students, e.g. teachers praised them for their patience, attentiveness, participation, hard-working attitude.
- Physical touching of students to get students' attention and to stop students' off task behaviour is used, e.g. teacher tapped student with a pen on student falling asleep, teacher's 'gentle squeeze' on students shoulder from the back as student was being off-task.
- Teachers should be prepared for contingencies, and we witnessed the success of one teacher; guest speaker was unable to make it to the meeting; yet, teacher already arranged 2 students (a male & a female)
Flipped Classroom advancing learning at home making more room for classroom interactive learning

Flipped Classroom in Hong Kong

A teacher in a local primary school used to put up presentation slides and assignments on the school's learning management system for students to revise and work on after class. When schools were closed down for weeks due to the outbreak of an epidemic disease, he began to tape his own presentations and put them online for students' viewing as a temporary substitute for class. He realised that students were able to demonstrate their learning in class discussions. A Flipped Classroom was then born, a local case that started off similar to a Khan Academy type of endeavour, i.e. an Internet learning platform with e-learning resources to sustain learning anywhere and anytime.
Welcome to Your New Wiki!

Getting Started
- Click on the edit button above to put your own content on this page.
- To invite new members, click on Manage Wiki and Invite People.
- To change your wiki's colors or theme, click on Manage Wiki and Look and Feel.
- To set who can view and edit your wiki, click on Manage Wiki and Permissions.

Need Help?
- Click on the help link above to learn more about how to use your wiki.
Writing Instruction using Computer-Supported Collaborative Learning

Author:
Anna Maria Wing

http://tccl.rit.albany.edu/knilt/index.php/Writing_Instruction_using_Computer-Supported_Collaborative_Learning
Role of Computers in Collaborative Learning

1) **Cognitive**: task requirement; productivity; subject knowledge & skills

2) **Socio-Cognitive**: interact; articulate; explanation; elaboration; make arguments; meaning making; knowledge construction

3) **Meta-Cognitive**: Reflection; planning; monitoring and regulation

4) **Social and Community**: Team building; affective; community building

5) **Epistemic**: Views of learning and knowledge
Knowledge Building: CSCL in Hong Kong Classrooms
Knowledge Building

A new way of thinking & Pedagogy
A Pioneering model of Computer-supported Collaborative Learning

Students working together to create and to improve ideas that add value to the (classroom)community.

- Pose problems, construct explanations, test ideas, rise above, make collective advances; sustained pursuit of inquiry

  Collective Cognitive Responsibility for idea improvement

Knowledge building supported by Knowledge Forum
Critical Thinking? Argumentation?

Argue: to offer reasons for or against something; to dispute; to disagree
The act or process of forming reasons, gathering evidence and of drawing conclusions and applying them
Improvable Ideas

Ideas are treated as improvable rather than simply accepted or rejected; ‘community’ proceeds continuously to improve ideas.

Not searching for the final answer but on the best explanation that will be revised

“Let’s design an experiment,” “How does it work, REALLY?”, “We used to think..., now we think...”
Rise Above

Work with **diverse ideas** in complex problem spaces;

Transcend trivialities and oversimplifications and work toward **higher level formulations of problems**

There's got to be a **better way**!

"Let's take this to a new level."

"I bet we are missing something important here,"

"How do we get beyond our current thinking?"

"It can't be that simple."

"We just keep going back and forth—this or that."

Community Knowledge

Team members produce ideas of value to others and share responsibility for the overall advancement of knowledge in the community.
Different Levels of Collaboration in Online Learning

- **Knowledge Sharing**
  - Sharing of opinion, information, resource

- **Knowledge Construction**
  - Meaning making and construction of deeper understanding; solving problems together

- **Knowledge Building/Creation**
  - Contributing and improving the state of knowledge of the classroom community

Features of Knowledge Forum

Welcome View: Organizing Curriculum & Inquiry

View: Communal space for building-on ideas
Scaffolds

Graphic Views

Rise-above

Structure of a note: Scaffolds and other support
Knowledge Building Pedagogy

How to conduct knowledge building in classroom?
Earthquake View

What do you want to study about earthquake?

What is earthquake? Why do earthquake happened?
What is water problem?

How to know the water is drinkable, and how to test it?

How to “clean” (purify) the polluted water, and make it drinkable?

Is there any country that drought and water pollution would happen frequently and why?
First students identify the problems of people chopping down trees because they need paper, then other students further build on them. For example, they asked whether food can be used for making paper instead of using wood. This is an important procedure for improving ideas.
Building on each others’ ideas

Building on notes

Authentic problems
Working on Idea Diversity

Students make the discussions through the learning platform from their diversified ideas. For example the discussing of “How can we reduce paper using?”, “Ways to save the environment?” and “Ways to Recycle?” These topics are linked and expand ideas to make productive use of diversity.
Constructive use of Authoritative Source


Students will refer some magazines, newspapers to support their own point of view.
Rise above notes

Rise above note is making the conclusion and summary about some big discussions, it helps to formulate the big ideas and advance the discourse.
Reflective Journal

- My Theory
- I need to understand
- New information
- This theory cannot explain
- A better theory
- Putting our knowledge together

When we were writing the application forms, we two had a same question: Why does people pay attention of the sustainability of the forest? We want to know the answer of this question so we attend this program.  
What we discussed... we discussed about why we have to sustain the forest, what can we do to save, protect the forest and what animals will affect the ecological system. 

We started talking at Hong Kong forest is shrinking. Geoffrey talked that the forest in Hong Kong.

Next, we talked about the balance of the oxygen and carbon dioxide. This is a good topic to build on because if the deforestation get worse, the oxygen and carbon dioxide will not be balance.

Afterwards, Geoffrey, Sebastian and other students talked about the waste of paper, how to solve the problem, and the topic of using less paper.

We had discussed about the land space to use. We said that the land were used to make factories and houses. The land space can be further discussed.

Then, Geoffrey had said that the paper could make the deforestation worse.
Applets Assessment Tools

Assessment Tools

Other Views:
- KBTN-1
- KBTN-1
- KBTN-1

Other Views:
- KBTN-1
- KBTN-1
- KBTN-1

Contribution
by Paul Johnson

Lexical Analysis
by Marc Lalancette

Semantic Overlap
by Chris Teplov

Social Network
by Paul Johnson

Vocabulary Growth
by Jud Curtis

Writing
by Ben Smith Lea
Self assessment and peer assessment are powerful qualitative assessment methods.

A student chooses the best note contributed by his group, his mostly appreciated note written by one of his classmate and his own best note. He gives detail explanation on his choices.
老师可以引导学生分析案例，让学生反思他们自己的学习过程、了解他们的想法和观点如何在讨论的过程中逐渐发展、转变和升华。

黄老师 通识教育科 平安福音中学
How does knowledge building work?
What is Learning?
Learning is an internal and individual process geared towards producing changes in belief or attitude.
“Learning-by-doing” is similar if the goal is to improve an individual’s skill at a particular task, performance, or competence.
Most school-based practice focuses on learning.

How is Knowledge Building different?
Knowledge Building (KB) involves creative, sustained work with ideas. The overarching objective is to work collaboratively to improve those ideas, and to extend the frontiers of public knowledge.

KB work focuses on knowledge that ‘lives in the world’ and can be modified and extended by others. KB calls for community discourse to advance knowledge on shared problems of understanding.
Community Building

Students and teachers working together
Exchange among Teachers in Hong Kong, Guangzhou, and Shenzhen
Knowledge Building International (KBI) was incorporated July 2012 as a non-profit membership-based corporation, with the intention to serve the knowledge building community of innovators and researchers, and dedicated to advancing research, practice, and public awareness of knowledge building.

Goals

- To promote collaboration among education and training practitioners, researchers, and engineers in the design of effective methods for building capacity for the creation of new knowledge.
- To promote application of the concepts of "knowledge creation" and "knowledge building" in educational and professional development contexts.
- To support the engagement of learners at all kinds and levels in authentic knowledge creation;
- To develop theory, pedagogy, and technology for assessing skills and abilities employed in knowledge creation;
- To design and collaborate closely with schools and other organizations in various countries to establish "hubs of innovation" in education for knowledge creation.

http://ikit.org/kbi/about
CSCL in Classroom: Helping Students to Learn and Collaborate using Computers

1) **Goal** of future-oriented education: Teach students to think and learn together and to create/innovate

2) **Learning**: Use computers to promote beneficial collaborative learning processes (beyond sharing to knowledge construction to creation)

3) **Pedagogy**: Putting students together do not mean they know how to collaborate – need to scaffold (prepare) students for collaboration.

4) **Assessment**: CSCL pedagogy and tools provide “windows” into students’ thinking and learning processes (e.g. what they understand; misconceptions; trajectory)

5) **Community**: Develop a learning and knowledge-building community culture (ethos/values). Students working together to improve ideas, rise above, and to contribute to collective growth
Knowledge Building at University of Hong Kong

http://kbc2.edu.hku.hk/

Knowledge Building/Knowledge Creation at University of Toronto

http://www.knowledge-building.org/