

Technology-enhanced Formative Feedback for Lifelong Learning: Emerging Classroom Practices

Dr Min Yang

Hong Kong Institute of Education

ASEM Forum on Lifelong Learning

10-11 March, 2015

Bali, Indonesia

Outline

- Research questions
- Theoretical background
- Context and methods:
- Findings
 - *The **yin** and **yang** in the use of technology-enhanced formative feedback to support lifelong learning*
- Implications for teachers and administrators in higher education



Research questions

- How can technology-enhanced formative feedback support lifelong learning among students in higher education classrooms?
- Data from two case studies at Hong Kong Institute of Education: classroom observations and teacher/student interviews from two classrooms

Theoretical background

Two relevant themes ~

1. Supporting lifelong learning through formative assessment practices in higher education

2. The use of technology-enhanced formative feedback as cognitive and social support for lifelong learners in classrooms

Supporting lifelong learning through formative assessment

- **Formative assessment**

- *“Practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers, to make decisions about the next steps in instruction that is likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that was elicited” (Black and Wiliam, 2009: p 9)*

Supporting lifelong learning through formative assessment

Role of **Feedback** as a core aspect of formative assessment:

- Feedback can help students identify and close the *gap between current and desired achievements* (Sadler, 2010)
 - *Assist in learning here and now*
 - a. Effective feedback should help students gain knowledge about *where they are, where they are going, and how to get there*
 - b. Effective feedback should facilitate students in making use of feedback to improve learning

Supporting lifelong learning through formative assessment

Role of **Feedback** as a core aspect of formative assessment:

- Eventually, effective feedback aims at helping students develop *self-regulative learning skills* (Hattie and Timperley, 2007)
 - *Assists in lifelong learning*
- a. Self-regulative learning involves students setting short and long-term learning goals; and directing and regulating learning process toward goals
- b. One way to promote self-regulated learning is making expected learning outcomes and assessment standards explicit by involving students in dialogues about concrete learning/assessment tasks

Supporting lifelong learning through formative assessment

In higher education (Boud, 2007; Chalmers, 2007)

- Institutional assessment policies emphasise the provision of feedback as an important facet of teachers' assessment practice to nurture students' capabilities for lifelong learning
- QA procedures, competing academic roles, and large class sizes make teachers focus feedback on assessment products at the end of the semester
- The formative power of feedback can be diminished if it is not embedded in everyday classrooms (Evans, 2013)

Technology-enhanced feedback that supports lifelong learning

- Integration of ICT into classroom feedback strategies is potentially a viable means to
 - a. increase opportunities for students to gain timely and meaningful feedback
 - b. generate feedback dialogues among teachers and students which provide both cognitive and social-emotional support to engage students in effective and active learning

Technology-enhanced feedback that supports lifelong learning

Examples of technology-enhanced feedback – evidence from research literature:

a. Instant feedback generated by technology-enabled (e-)assessment tasks:

- *computer-based interactive concept maps* (Wu et al., 2011) with real-time assessment and feedback to help students clarify knowledge structures
- *turn-it-in in learning management system* formatively used on draft essays to help students interpret similarity rates and reduce risks of committing plagiarism (Rolfe, 2011)

Technology-enhanced feedback that supports lifelong learning

Other means of instant feedback:

- *online quizzes* with embedded feedback messages on incorrect answers to MCQs
- *serious games* (play-based learning, e.g. business management simulations) used to assess cognitive skills/competences involved in the game and track progress (Bellotti et al., 2013)

Technology-enhanced feedback that supports lifelong learning

b. Collaborative learning and peer feedback via e-learning platforms and online social networks

- sharing of e-portfolios *on* Mahara for peer comments (Barbara, 2009; Luchoomun et al., 2010)
- collectively created blogs and wikis on internet-based social networks for co-construction of knowledge (Hatzipanagos & Warburton, 2009)
- → Lesson learned: curriculum and assessment design should enable recurrent teacher and peer-feedback in technology-enabled formative assessment (Kali et al., 2009)

Technology-enhanced feedback that supports lifelong learning

These examples illustrate the concept of **formative e-assessment** proposed by Pachler et al. (2010, p. 716):

- *“the use of ICT to support the iterative process of gathering and analysing information about student learning by teachers as well as learners and of evaluating it in relation to prior achievement and attainment of intended, as well as unintended learning outcomes.”*

Context and methods

- Two case studies from an internal research grant project
- Sampling: purposive – 2 teachers pursuing effective feedback practices (6 teachers in the project)
- Duration: March – May 2014
- Courses involved: 2 general education courses - one core for Year-1 BEd undergraduates; one elective for Year-2 undergraduates (various disciplines)
- Class size: around 20

Context and methods

Data collection:

- *classroom observations* (2 times in each class)
- *2 teacher interviews* in Chinese or English
- *5 student focus groups* in Chinese
- documents: course outlines and student handbooks

Written transcripts / records:

- Records of classroom dialogues: summaries and observation notes, with selected conversations fully transcribed in English
- Transcription of interviews: fully transcribed in English

The two case studies

- Technology, Entertainment and Mathematics
 - an elective course of 3 credits, spanning one semester, enrolling mainly Year-1 and Year-2 students, 3-hour lecture per week
 - Dr Wong Ka Wai Gary and his 15 students
- General Education Foundation
 - a core course of 6 credits, spanning two semesters, enrolling Year-1 students, 2-hour lecture and 2-hour tutorial per week
 - Dr Lee Thai Hoi Theodore and his 20+ students in the tutorials

Findings

- *The **yin** and **yang** in the use of technology-enhanced formative feedback to support lifelong learning*
 - a. Complementing elements found in the two teachers' technology-enhanced feedback strategies
 - b. Task design intentions enabling the technology-enhanced feedback
 - c. Students' responses to the technology-enhanced feedback
 - d. Implications for lifelong learning among higher education students



What are yin and yang?

- In Chinese philosophy, *yin and yang* represent perfect and harmonic balance
 - They describe how obviously opposite or contradictory forces interact and give rise to each other in the world
 - *yin and yang* are therefore complementary (rather than opposing) forces
- (http://en.wikipedia.org/wiki/Yin_and_yang)



Complementing elements in technology-enhanced feedback

- Explication of knowledge and skills in **direct instruction** via **PPT lecture notes**
- **Instant feedback** generated by **online and computer-based games, mobile apps and online surveys (Socratic)**

1. formal instruction

vs play-like tasks

Task design intentions enabling instant feedback based on games, mobile apps and online surveys

- The use of games, mobile apps and online surveys was intended
 - to encourage exploration and application of knowledge and skills introduced in direct instruction
 - to increase motivation and interest
 - to provide a sense of involvement
 - to encourage collaborative learning and peer-feedback when completed in groups
 - through play-like learning and collaboration, to promote positive emotions and sense of social-relatedness

Task design intentions enabling instant feedback based on games, mobile apps and online surveys

- Dr Wang's explanation of his intention to students:
- *You don't need sophisticated mathematical knowledge in this game (using programming to create a computer game), because it has already done for you. However, you still need to know mathematical logics about the condition and about the causes. And you will know to build up a game is to set up rules and set up logics. I hope this software could illustrate this point for you. (Excerpt from classroom observation notes)*

Students' responses to instant feedback based on games, mobile apps and online surveys

- *Dr Wong would look for some easier ways for us to write a programme. The programme for the last lesson is far better than the one from the course of my major. He is more thoughtful. His teaching materials are thoughtful. The course design is thoughtful as well. The course outline provided reflects what he wants you to learn from the course. He is not just teaching what he is good at. (S8)*

Students' responses to instant feedback based on games, mobile apps and online surveys

- *At the beginning of the course, he introduced an app called 'Socrative'. It collects students' opinions. It has secret ballot. I think it is good as it encourages students to join discussion in class. Hong Kong students are reluctant to answer questions. This app allows you to express your opinion without raising your hand. (S3)*
- *He would ask a question and some options. And then you do the voting. The result will be shown at the end. No one would know what other is voting for. And everyone can participate in the class. This is better than asking a specific person to answer question, no one would answer this way.(14:40) Yes. And we can play with iPad. (S7)*

Students' responses to instant feedback based on games, mobile apps and online surveys

- *There is a lesson on the history of computer. It also mentioned how some mathematicians and engineers have contributed to computer technology in the past. It requires us to pick two inventors and research on them on Wikipedia. After that we need to complete an online form about the information of those inventors. We have to submit it immediately. (S5)*
- *It was an in-class activity. We come up with the contributions of around 30 mathematicians. We summarize their contributions into some messages. For example, most scholars of computer science are mathematicians at the beginning. These hidden messages are interesting. This way makes everyone contributes to the class. (S9)*

Implications for lifelong learning among higher education students

- Instant feedback generated by technology-supported tasks is recognised by students as fun, thoughtful, relevant and meaningful
- By promoting students' active engagement in tasks, this technology-enhanced feedback strategy contributes to students' intrinsic interest and motivation
- Intrinsic interest and motivation are, in turn, necessary for them to adopt deep approaches to learning (Biggs and Tang, 2011)



Complementing elements in technology-enhanced feedback

- Teacher oral feedback on students' e-journal entries about lecture topics during face-to-face tutorials
- Peer-feedback generated by online sharing of group assignments on Facebook for the course

2. teacher oral feedback

vs collaborative learning & peer-feedback

Task design intentions enabling the combination of teacher- and peer-feedback

Dr Lee's interview:

- *My feedback of e-journal is normally presented as reflective questions. 'Am I writing good or precisely?' If the feedback is a question, it will involve them in further thinking. 'Am I thinking on the right track? Is it the right direction? Do I need to think more?'*
- *We posted something to Facebook that discussed in tutorials according to students' request. For example, they told me they wanted to review the e-journals again. I can choose what should be presented to other students (who were not the authors).*

Task design intentions enabling the combination of teacher- and peer-feedback

Dr Lee's feedback on an e-journal entry during class:

- *Some of you mentioned how to understand current poverty issues. One of the students said that poor people have to apply for the CSSA. Does this really represent the current situation? Do poor people really have no choices? Why are other choices not available? ...Are there any reasons that prevent other choices? This is the direction in which we can think in more depth.*

Students' responses to instant feedback based on games, mobile apps and online surveys

- *He wants us to put our PowerPoint to the Facebook group one week in advance before presentation. We can comment on each other's work and share our ideas. (S21)*
- *We don't mind (sharing the PowerPoint). We all want a better grade in this course. **The reason for Dr. Lee to open a Facebook platform for us is that he wants us to learn from each other and exchange the ideas with each other. (S23)***
- *Some classmates post videos which are relevant to the topics onto the platform. (S22)*

Students' responses to instant feedback based on games, mobile apps and online surveys

- *I think it (group activities and sharing) promotes interaction between me and my classmates. Sometimes my classmates can think of some ideas that I may have overlooked. In this way, we can exchange the ideas among ourselves. And this is very important because learning is two-way but not only individually based. Learning from each other can facilitate improvement. (S23)*

Implications for lifelong learning among higher education students

- Peer-feedback promoted through the use of social networks (and e-learning platforms such as Moodle) can assist students' exchange of ideas and extend collaborative learning beyond face-to-face interactions in class
- Students recognised peer-feedback as useful in complementing teacher-feedback
- Web-based peer feedback can therefore increase students' dialogue on qualities of learning and assessment tasks and promote their collaborative and independent learning which are conducive to self-regulative learning (Nicol et al. 2013)

Conclusions

- The two case studies provide evidence on the role of technology-enhanced feedback to facilitate lifelong learning among students in higher education
- Clear task design intentions of teachers and clear communication of the intentions to students through regular feedback dialogues are the **yin** and **yang** of effective technology-enhanced feedback in everyday classrooms



Some reflections

✧ Teachers / practitioners of higher education:

- What lifelong learning skills and disposition mean for students and graduates in your field?
- In using technology-enhanced formative assessment and feedback, what are your professional development challenges?
- How will you embrace and deal with the challenges?

Some reflections

- Researchers of higher education
- What emerging practices of technology-enhanced formative assessment and feedback need to be captured or more fully explored?
- How can we involve “highly skillful users” of ICT among teachers and students in scholarship of learning and teaching, so that research evidence is more relevant to front-line teachers and to students?
- How can research contribute to assessment and learning culture change at system, institution and classroom levels?

Some reflections

✧ Academic developers and administrators:

- How can frontier teachers be supported in harnessing the power of ICT to optimise lifelong learning opportunities for students of traditional age and their mature counterparts?
- How can less confident/competent and less enthusiastic teachers be engaged in making use of ICT for pedagogic and formative assessment purposes?
- What are possible means for institutional change of culture in the use of ICT for lifelong learning beyond upgrading technological infrastructure and facilities?

Some reflections

✧ Higher education policy makers

- How can schools and HEIs join hand-in-hand in creating and promoting innovative and user-friendly approaches to technology-enhanced formative assessment and feedback for better lifelong learning opportunities among all learners?

Questions and comments welcome😊

Email:

myang@ied.edu.hk

Department of Curriculum and
Instruction

Hong Kong Institute of Education

