

THE EDUCATION UNIVERSITY OF HONG KONG

Course Outline

Part I

Programme Title	: Doctor of Education (Mathematics Education – Directed Study)
Course Title	: MATH 1 – Research and Issues in Mathematics Learning
Course Code	: MTH7122
Department	: Mathematics and Information Technology
Credit Points	: 3
Course Hours	: 39 hours
Pre-requisite(s)	: Nil
Level	: Foundation Stage

Part II

1. Synopsis

This course aims to provide the candidates with an overview of both cognitively and affectively oriented research on the learning of mathematics. It focuses on young children development, student identity, growth of discourses and advanced mathematical thinking. Cognitive and affective theories and models relevant to learning of mathematics will be visited to provide an opportunity to critically reflect upon major issues and research findings concerning students' development of mathematical abilities. The focus is on empowering teachers and practitioners of related-disciplines in cultivating student-centered environments conducive to effective learning.

2. Course Intended Learning Outcomes (CILOs)

Upon completion of this course, students will be able to:

- CILO₁ understand the key issues, theories and current arguments in the psychology of mathematics education;
- CILO₂ synthesize ideas from a critical analysis of current cognitively and affectively oriented research articles for the improvement in mathematics learning;
- CILO₃ apply the learned knowledge to their own classrooms or professional practices in making better informed judgments concerning student learning;
- CILO₄ design and undertake small-scale inquiries into their working environments concerning the psychology of mathematics learning by examining current research with reference to literature.

3. Content, CILOs and Teaching & Learning Activities

Course Content	CILOs	Suggested Teaching & Learning Activities
Cognitive theories and models relevant to mathematics learning	CILO _{1,2}	<ul style="list-style-type: none"> ▪ Lecturer-led Q&A ▪ Guided Research Activities
Affective domain on mathematics education	CILO _{1,2}	<ul style="list-style-type: none"> ▪ Lecturer-led Q&A ▪ Guided Research Activities
Situated cognition and learning in context	CILO _{2,3}	<ul style="list-style-type: none"> ▪ Lecturer-led Q&A ▪ Problem-Based Learning Activities
Mathematical problem solving and metacognition	CILO _{3,4}	<ul style="list-style-type: none"> ▪ Problem-Based Learning Activities ▪ Guided Research Activities
Research and development on specific learning theories/models in mathematics context	CILO _{3,4}	<ul style="list-style-type: none"> ▪ Problem-Based Learning Activities ▪ Guided Research Activities

4. Assessment

Assessment Tasks	Weighting (%)	CILO
(a) A presentation on the articulation of self-selected readings and on possible future research directions.	20	CILO _{1,2,3}
(b) An analytical and critical essay of around 4000 words on one of the topics in the Content Themes.	80	CILO _{1,2,3,4}

5. Required Text(s)

Nil

6. Recommended Readings

Alexander, P. A., & Winne, P. H. (Eds.) (2006). *Handbook of educational psychology* (2nd Ed.). Mahwah, N.J.: Lawrence Erlbaum Associates.

Carpenter, T. P., Dossey, J. A., & Koehler, J. L. (Eds.) (2004). *Classics in mathematics education research*. Reston, Va.: National Council of Teachers of Mathematics.

*Desoete, A., & Veenman, M. (Eds.) (2006). *Metacognition in mathematics education*. New York: Nova Science Pub., Inc.

*English, L. D. (Ed.) (2004). *Mathematical and analogical reasoning of young learners*. Mahwah, N.J.: Lawrence Erlbaum Associates.

English, L. D. (Ed.) (2008). *Handbook of international research in mathematics education* (2nd

Ed.) New York: Routledge.

Ernest, P. (1997). *Social Constructivism as a Philosophy of Mathematics*. Albany, New York: State University of New York Press.

Goodchild, S., & English, L. (Eds.) (2002). *Researching mathematics classrooms: a critical examination of methodology*. Westport, CT: Praeger.

*Gutiérrez, A., & Boero, P. (Eds.) (2006) *Handbook of research on the psychology of mathematics education: past, present and future*. Rotterdam, The Netherlands : Sense Publishers

Nickson, M. (2004). *Teaching and learning mathematics: a guide to recent research and its applications* (2nd Ed.) London: Continuum.

Royer, J. M. (Ed.) (2005). *The cognitive revolution in educational psychology*. Greenwich, CT: Information Age Pub.

Skemp, R. R. (1987) *The Psychology of Learning Mathematics (2nd Ed.)*, Erlbaum, London.

*Steffe, L. P., Neshor, P., Cobb, P., Goldin, G. A. and Greer, B. Eds. (1996) *Theories of Mathematical Learning*, Mahwah, New Jersey, Erlbaum.

Those marked by () are highly recommended.*

7. Related Web Resources

<http://www.flaguide.org/cat/math/math/math1.php> <http://mathforum.org/brap/wrap/>
<http://www.cut-the-knot.com/front.shtml>

8. Related Journals

Mathematical Thinking and Learning
Teaching Children Mathematics
The Journal of Mathematical Behavior
Mathematics Teaching in Middle Schools

9. Academic Honesty

The University adopts a zero tolerance policy to plagiarism. For the University's policy on plagiarism, please refer to the *Policy on Academic Honesty, Responsibility and Integrity with Specific Reference to the Avoidance of Plagiarism by Students* (<https://www.eduhk.hk/re/modules/downloads/visit.php?cid=9&lid=89>). Students should familiarize themselves with the Policy.

10. Others

Nil

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