Course Description

MEDD6389 The Philosophical, Social and Cultural Aspects of Mathematics Education

Course description
This course focuses on the features that characterise mathematics as a distinctive discipline. It explores the relationship between the nature of the discipline, the aims of mathematics education, and the nature of mathematics teaching and learning. The effect on teachers' and students' beliefs and attitudes, and on students' achievement will also be discussed. In addition, this course investigates the social and cultural factors that affect the teaching and learning of mathematics. This includes international comparisons of socio-cultural differences; ethnomathematics from anthropological and utilitarian perspectives; social inequalities including gender issues; and the relationship between language and mathematics. The objectives of the course are to enable students to (1) reflect critically on the features that characterise mathematics as a distinctive discipline, and be aware of the conflicting views on the nature of mathematical knowledge, (2) explore the relationship between the nature of mathematics and the nature of mathematics teaching and learning, (3) explore the social and cultural factors that affect the teaching and learning of mathematics, (4) reflect upon the aims of mathematics education and how mathematics instruction should be conducted, and (5) reflect critically on how teachers' views of mathematics and mathematics education affect their own practice.
Course objectives
The objectives of the module are to enable students to (a) reflect critically on the features that characterize mathematics as a distinctive discipline, and be aware of the conflicting views on the nature of mathematical knowledge; (b) explore the relationship between the nature of mathematics and the nature of mathematics teaching and learning; (c) explore the social and cultural factors that affect the teaching and learning of mathematics; (d) reflect upon the aims of mathematics education and how mathematics instruction should be conducted, and (e) reflect critically on how teachers' views of mathematics and mathematics education affect their own practice.

Course learning outcomes (CLOs)	**Aligned programme learning outcomes (PLOs)**
1. Reflect critically on the features that characterize mathematics as a distinctive discipline, and be aware of the conflicting views on the nature of mathematical knowledge	PLOs 1, 3
2. Explore the relationship between the nature of mathematics and the nature of mathematics teaching and learning	PLOs, 2, 3
3. Explore the social and cultural factors that affect the teaching and learning of mathematics.	PLOs 2-4
4. Reflect upon the aims of mathematics education and how mathematics instruction should be conducted accordingly.	PLOs 1, 3, 4, 5
5. Reflect critically on how teachers' views of mathematics and mathematics education affect their own practice.	PLOs 1-5

Course assessment methods
• Reflective reading • Reflection on mathematics classroom incident • Individual essay
Course content and topics
• Introduction: Rethinking our mathematical experiences in relation to the nature of mathematics and its socio-cultural context • Nature of mathematics and its applications • Mathematical truth and meaning

- Mathematics as a social activity
- Mathematics education in the society
- Socio-cultural perspectives of mathematics education
- Culture and mathematics learning and teaching

Required / recommended readings and online materials

1. Ernest, P. (2018). The philosophy of mathematics education: An overview. In P. Ernest (Ed.), The philosophy of mathematics education today (pp. 13-35). New York: Springer.
2. FitzSimons, G. E. (2002). Introduction: Cultural aspects of mathematics education. Journal of Intercultural Studies, 23(2), 109-118.
3. Goos, M. (2014). Creating opportunities to learn in mathematics education: A sociocultural perspective. Mathematics Education Research Journal, 26, 439-457.
4. Prediger, S. (2007). Philosophical reflections in mathematics classrooms: Chances and reasons. In K. Francois & J. P. van Bendegem (Eds.), Philosophical dimensions in mathematics education (pp. 43-59). New York: Springer.
5. Wong, N.-Y. (2002). Conceptions of doing and learning mathematics among Chinese. Journal of Intercultural Studies, 23(2), 211-229.

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