



ECED827

Learning Through Mathematics, Science and Technology in Early Childhood Settings

S2 External 2016

Institute of Early Childhood

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General Information

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Second contact

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Credit points

4

Prerequisites

(ECED600 or ECED817) or admission to MEChild or MEdLead in Early Childhood or PGDipEChild or PGCertEChild or MEd or PGDipEdS or MIndigenousEd or PGDipIndigenousEd or PGCertIndigenousEd or MSpecEd or PGDipSpecEd or PGCertSpEd

Corequisites

Co-badged status

Unit description

This unit explores theories of learning in mathematics, science and technology for young children (birth to five years). Students will examine the specialist role of play and conceptual development in a range of early childhood settings. Current issues in research and practice will be investigated through independent study. Students acquire autonomy and expert knowledge of pedagogy and content for mathematics, science and technology as they design and evaluate learning experiences for young children.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

1. Demonstrate a fundamental understanding of the major theoretical developments in early childhood mathematics, science and technology education;
2. Examine the role of play in children's mathematics, science and technology learning;
3. Demonstrate how children use play to represent their experiences, construct knowledge about, and make sense of their world;
4. Evaluate a variety of mathematics, science and technology resources;
5. Engage in the multi-faceted task of early childhood curriculum design with an emphasis on mathematics, science and technology;
6. Locate, analyse and synthesise a wide range of current research literature;
7. Identify problems or issues of relevance to early childhood mathematics, science, and technology education;
8. Identify strategies to successfully link mathematics, science and technology learning to the child's home environment and community.

General Assessment Information

There are three separate assessment tasks for this unit.

Assessment Tasks

Name	Weighting	Due
<u>Technology for learning</u>	35%	5 September 2016
<u>Mathematics and science</u>	35%	7 November 2016
<u>Critical reflections</u>	30%	Weekly

Technology for learning

Due: **5 September 2016**

Weighting: **35%**

Review of technology for learning in mathematics and science

On successful completion you will be able to:

- 1. Demonstrate a fundamental understanding of the major theoretical developments in early childhood mathematics, science and technology education;
- 2. Examine the role of play in children's mathematics, science and technology learning;
- 3. Demonstrate how children use play to represent their experiences, construct knowledge about, and make sense of their world;
- 4. Evaluate a variety of mathematics, science and technology resources;

- 5. Engage in the multi-faceted task of early childhood curriculum design with an emphasis on mathematics, science and technology;
- 6. Locate, analyse and synthesise a wide range of current research literature;
- 7. Identify problems or issues of relevance to early childhood mathematics, science, and technology education;
- 8. Identify strategies to successfully link mathematics, science and technology learning to the child's home environment and community.

Mathematics and science

Due: **7 November 2016**

Weighting: **35%**

Journal article detailing mathematics and science learning experience.

On successful completion you will be able to:

- 1. Demonstrate a fundamental understanding of the major theoretical developments in early childhood mathematics, science and technology education;
- 2. Examine the role of play in children's mathematics, science and technology learning;
- 3. Demonstrate how children use play to represent their experiences, construct knowledge about, and make sense of their world;
- 4. Evaluate a variety of mathematics, science and technology resources;
- 5. Engage in the multi-faceted task of early childhood curriculum design with an emphasis on mathematics, science and technology;
- 6. Locate, analyse and synthesise a wide range of current research literature;
- 7. Identify problems or issues of relevance to early childhood mathematics, science, and technology education;
- 8. Identify strategies to successfully link mathematics, science and technology learning to the child's home environment and community.

Critical reflections

Due: **Weekly**

Weighting: **30%**

Weekly reflective blog posts.

On successful completion you will be able to:

- 1. Demonstrate a fundamental understanding of the major theoretical developments in early childhood mathematics, science and technology education;

- 2. Examine the role of play in children's mathematics, science and technology learning;
- 3. Demonstrate how children use play to represent their experiences, construct knowledge about, and make sense of their world;
- 4. Evaluate a variety of mathematics, science and technology resources;
- 5. Engage in the multi-faceted task of early childhood curriculum design with an emphasis on mathematics, science and technology;
- 6. Locate, analyse and synthesise a wide range of current research literature;
- 7. Identify problems or issues of relevance to early childhood mathematics, science, and technology education;
- 8. Identify strategies to successfully link mathematics, science and technology learning to the child's home environment and community.

Delivery and Resources

The unit consists of weekly seminars of two-hour duration (Internal students), or a full day on campus session (external students) and a week of independent research and study. Each tutorial session will comprise lecturer input, discussion and hands-on workshop.

All students are required to:

1. Download the topic notes and tutorial activities from iLearn (bringing these to tutorials each week in hard copy or in an electronic format). Topic notes and tutorial activities are available from iLearn, one week prior to each tutorial.
2. Read the set weekly readings *prior* to the seminars each week/ on campus session
3. Respond to the readings, by posting a 300 word reflection each week on the discussion board and
4. Actively participate in discussions and hands-on activities during the tutorials.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

New Assessment Policy in effect from Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy_2016.html. For more information visit http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public <http://www.mq.edu.a>

[u/policy/docs/complaint_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au.

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcome

- 5. Engage in the multi-faceted task of early childhood curriculum design with an emphasis on mathematics, science and technology;

Assessment tasks

- Technology for learning
- Mathematics and science
- Critical reflections

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- 1. Demonstrate a fundamental understanding of the major theoretical developments in early childhood mathematics, science and technology education;
- 2. Examine the role of play in children's mathematics, science and technology learning;
- 3. Demonstrate how children use play to represent their experiences, construct knowledge about, and make sense of their world;
- 4. Evaluate a variety of mathematics, science and technology resources;
- 5. Engage in the multi-faceted task of early childhood curriculum design with an emphasis on mathematics, science and technology;
- 7. Identify problems or issues of relevance to early childhood mathematics, science, and technology education;
- 8. Identify strategies to successfully link mathematics, science and technology learning to the child's home environment and community.

Assessment tasks

- Technology for learning
- Mathematics and science
- Critical reflections

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- 1. Demonstrate a fundamental understanding of the major theoretical developments in early childhood mathematics, science and technology education;
- 2. Examine the role of play in children's mathematics, science and technology learning;
- 4. Evaluate a variety of mathematics, science and technology resources;
- 6. Locate, analyse and synthesise a wide range of current research literature;
- 7. Identify problems or issues of relevance to early childhood mathematics, science, and technology education;

Assessment tasks

- Technology for learning
- Mathematics and science
- Critical reflections

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- 1. Demonstrate a fundamental understanding of the major theoretical developments in early childhood mathematics, science and technology education;
- 5. Engage in the multi-faceted task of early childhood curriculum design with an

emphasis on mathematics, science and technology;

- 6. Locate, analyse and synthesise a wide range of current research literature;
- 7. Identify problems or issues of relevance to early childhood mathematics, science, and technology education;
- 8. Identify strategies to successfully link mathematics, science and technology learning to the child's home environment and community.

Assessment tasks

- Technology for learning
- Mathematics and science
- Critical reflections

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes

- 3. Demonstrate how children use play to represent their experiences, construct knowledge about, and make sense of their world;
- 5. Engage in the multi-faceted task of early childhood curriculum design with an emphasis on mathematics, science and technology;

Assessment tasks

- Technology for learning
- Mathematics and science
- Critical reflections

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcomes

- 4. Evaluate a variety of mathematics, science and technology resources;
- 7. Identify problems or issues of relevance to early childhood mathematics, science, and technology education;
- 8. Identify strategies to successfully link mathematics, science and technology learning to the child's home environment and community.

Assessment tasks

- Technology for learning
- Mathematics and science
- Critical reflections

Changes since First Published

Date	Description
24/10/2016	I have added Maria Chatzigianni as second contact