ECHE2320

Mathematical and Scientific Thinking in the Early Years

Session 2, Special circumstance, Other 2020

Macquarie School of Education

Contents

Disclaimer

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Notice

As part of Phase 3 of our return to campus plan, most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to timetable viewer. To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff
Convenor/ lecturer
Kelly Johnston
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Contact via email

Tutor
Carolyn Palmer
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Contact via email

Credit points
10

Prerequisites
ECH113 or ECHE1130 or (40cp at 1000 level or above) and admission to BTeach(ECS)

Corequisites

Co-badged status

Unit description
This unit explores mathematical and scientific thinking, teaching and learning in early childhood education (birth to five years). Key mathematical and scientific concepts and processes will be investigated and considered in terms of theory, research, pedagogical practice and play-based learning. Students will gain in-depth understandings of how mathematics and science underpin ways of acquiring and processing information about the world, now and in the future.

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:

> **ULO1:** Demonstrate a fundamental understanding of the major theoretical developments, central concepts, modes of enquiry, pedagogical practice and inclusion of relevant technologies in early childhood mathematics and science.

ULO2: Develop skills in designing, implementing and evaluating learning experience sequences using knowledge from the National Quality Frameworks and other curriculum requirements of the Education Act.

ULO3: Begin to evaluate mathematics and science learning resources in light of their experience as a teacher of young children.

ULO4: Demonstrate research-based knowledge of the models of pedagogy for teaching and assessing mathematics and science.

ULO5: Develop an understanding of different learning approaches to teaching and learning and the need for pedagogical approaches that are socially and culturally relevant, including use of technology.

General Assessment Information

Assessment Presentation and Submission Guidelines

Please follow these guidelines when you submit each assignment:

- Allow a left and right-hand margin of at least 2cm in all assignments.
- Please type all assignments using 12-point font and 1.5 spacing.
- All assessments must be submitted through Turnitin in .doc or .pdf format
- It is the responsibility of the student to ensure that all assessments are successfully submitted through Turnitin.
- Faculty assignment cover sheets are <u>NOT</u> required.

Draft Submissions & Turnitin Originality Reports

- Students may use Turnitin's Originality Report as a learning tool to improve their academic writing if this option is made available in the unit.
- Students are strongly encouraged to upload a draft copy of each assessment to Turnitin at least one week prior to the due date to obtain an Originality Report.
- The Originality Report provides students with a similarity index that may indicate if plagiarism has occurred. Students will be able to make amendments to their drafts prior to their final submission on the due date.
- Generally, one Originality Report is generated every 24 hours up to the due date.

Please note:

- Students should regularly save a copy of all assignments before submission,
- Students are responsible for checking that their submission has been successful and has been submitted by the due date and time.

Assignment extensions and late penalties

- In general, there should be no need for extensions except through illness or misadventure that would be categorised as serious and unavoidable disruption according to the University definition of same, see: https://students.mq.edu.au/study/my-study-program/special-consideration
- Applications for extensions must be made via AskMQ according to the Special Consideration policy. Extensions can only be granted if they meet the Special Considerations policy and are submitted via https://ask.mq.edu.au/. This will ensure consistency in the consideration of such requests is maintained.
- Late submissions: Unless a Special Consideration request has been submitted and approved, (a) a penalty for lateness will apply – two (2) marks out of 100 will be deducted per day for assignments submitted after the due date – and (b) no assignment will be accepted more than seven (7) days (incl. weekends) after the original submission deadline. No late submissions will be accepted for timed assessments – e.g. quizzes, online tests. Late penalties are applied by unit convenors or their delegates after tasks are assessed.
- If a student is still permitted to submit on the basis of unavoidable disruption, an alternative topic may be set.
- Students should keep an electronic file of all assessments. Claims regarding "lost" assessments cannot be made if the file cannot be produced. It is also advisable to keep an electronic file of all drafts and the final submission on a USB untouched/unopened after submission. This can be used to demonstrate easily that the assessment has not been amended after the submission date.

Requesting a re-assessment of an assignment

If you have **evidence** that your task has been incorrectly assessed against the grade descriptors you can request a re-mark. To request a re-mark you need to contact the unit convenor within **7 days** of the date of return of the assignment and provide **a detailed assessment of your script against the task criteria.** Evidence from your assignment must be provided to support your judgements.

Note: Failed assessments cannot be re-marked as they are all double-marked as a part of the moderation process.

Please note: The outcome of a re-mark may be a **higher/lower or unchanged grade**. Grades are *standards referenced* and effort is NOT a criterion.

University policy on grading

Criteria for awarding grades for assessment tasks

Assignments will be awarded grades ranging from HD to F according to guidelines set out in the University's Grading Policy. The following descriptive criteria are included for your information.

Descriptive Criteria for awarding grades in the unit

In order to meet the unit outcomes and successfully pass this unit, students must make a genuine attempt at all assessment tasks. Where any submitted assessment task is considered to be unsatisfactory in this regard, the highest possible final grade that can be awarded for the unit will be 45.

Students will be awarded grades ranging from HD to F according to guidelines set out in the policy: https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/assessment-in-effect-from-session-2-2016

The following generic grade descriptors provide university-wide standards for awarding final grades.

Grade	Descriptor
HD (High Distinction)	Provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application as appropriate to the discipline.
D (Distinction)	Provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.
Cr (Credit)	Provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; convincing argumentation with appropriate coherent justification; communication of ideas fluently and clearly in terms of the conventions of the discipline.
P (Pass).	Provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; routine argumentation with acceptable justification; communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes
F (Fail)	Does not provide evidence of attainment of learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; missing, undeveloped, inappropriate or confusing argumentation; incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.

Note: *If you fail a unit with a professional experience component the fail grade will be on your transcript irrespective of the timing of the placement.*

Withdrawing from this UG Unit

If you are considering withdrawing from this unit, please seek academic advice via https://ask.mq.edu.au before doing so as this unit may be a co-requisite or prerequisite for units in the following sessions and may impact on your progression through the degree.

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.

Assessment Tasks

Name	Weighting	Hurdle	Due
Mathematical concepts and processes in storytelling	50%	No	Week 7

Name	Weighting	Hurdle	Due
Science in play-based learning	50%	No	Week 13

Mathematical concepts and processes in storytelling

Assessment Type [1]: Learning plan
Indicative Time on Task [2]: 29.5 hours
Due: **Week 7**
Weighting: **50%**

3000 words Students will be provided with a list of children's literature/ books which include mathematical themes, concepts and processes. Alternatively, the students can select their own book (but should check with the convenor). They must select two books- one suitable for birth to two years, and one suitable for three to five years of age. Students are required to identify the mathematical concepts and processes in each book. They must then plan a sequence of two or three experiences for each book. This should include reference to diverse learners/ culture or background. Also must link with the EYLF and may link with ES1 in the school curriculum Students should demonstrate knowledge of mathematical concepts and processes. They should also show that they can identify these in storybooks, and then extend on storytelling experience to create follow on experiences.

On successful completion you will be able to:
- Demonstrate a fundamental understanding of the major theoretical developments, central concepts, modes of enquiry, pedagogical practice and inclusion of relevant technologies in early childhood mathematics and science.
- Develop skills in designing, implementing and evaluating learning experience sequences using knowledge from the National Quality Frameworks and other curriculum requirements of the Education Act.
- Begin to evaluate mathematics and science learning resources in light of their experience as a teacher of young children.
- Demonstrate research-based knowledge of the models of pedagogy for teaching and assessing mathematics and science.
- Develop an understanding of different learning approaches to teaching and learning and the need for pedagogical approaches that are socially and culturally relevant, including use of technology.

Science in play-based learning

Assessment Type [1]: Learning plan
Indicative Time on Task [2]: 29.5 hours
Due: **Week 13**
Weighting: **50%**

3000 words Students will select a science concept/ topic to focus on and develop a series of experience and resources that can be explored through play-based learning with children in prior-to-school contexts. Science concepts and processes will be identified and explained with clear links to the EYLF. Learning experiences should include a focus on sustainability and indigenous perspectives.

On successful completion you will be able to:
- Demonstrate a fundamental understanding of the major theoretical developments, central concepts, modes of enquiry, pedagogical practice and inclusion of relevant technologies in early childhood mathematics and science.
- Develop skills in designing, implementing and evaluating learning experience sequences using knowledge from the National Quality Frameworks and other curriculum requirements of the Education Act.
- Begin to evaluate mathematics and science learning resources in light of their experience as a teacher of young children.
- Demonstrate research-based knowledge of the models of pedagogy for teaching and assessing mathematics and science.
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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Required Textbooks

Macdonald, A. (2018). *Mathematics in early childhood.* Oxford.

Campbell, C., Jobling, W., & Howitt, C. (2018). *Science in early childhood.* Cambridge

Information about the unit iLearn site

This unit has a full web presence through *iLearn*.

Students will need regular access to a computer and the Internet to complete this unit.

Weekly access to iLearn is compulsory for all students. Important assessment information will be posted here, as will other relevant unit notices and materials, including a reading template and guide to lecture note taking to assist your studies.

Various activities and materials for discussion and critical reflection are included and external students especially are encouraged to use this web component. Electronic links and suggested references will be included in the Resources section. Please check the iLearn unit regularly.

Lectures

Weekly lectures are available on the web through the ECHO360 lecture component. You must listen to all lectures.

PowerPoint slides are available in iLearn in advance of the weekly lecture and/or are available in the Active Learning Tool.

Access and technical assistance

Information for students about access to the online component of this unit is available at ilearn.mq.edu.au/login/MQ/. You will need to enter your student username and password.

Please do **NOT** contact the Unit Convenor regarding *iLearn* technical help.

No extensions will be given for any technical issues. Allow enough time for your submissions.

Assistance is available from IT Helpdesk ph: 1800 67 4357, or log a request at help.mq.edu.au. OneHelp is the online IT support service for both students and staff.

This unit requires students to use several ICT and software skills:

- **Internet access**: The i*Learn* site contains materials for this unit; it is also required for the online submission of all Assessment Tasks, and for the use of Turnitin submission for ALL tasks.
- **Word processing, visual representations, and document formatting**: You are required to use an appropriate form of software to present your assignments.
- **Uploading** of assessment tasks to **iLearn**.

Structure

The unit comprises a one-hour lectures and online tutorials. In the tutorial students will discuss issues and questions arising from the lectures and prescribed readings. They are expected to base their arguments/discussions on evidence from published research and other relevant material. Attendance at all tutorials is expected. Attendance at remote 'on campus days' for external students is also expected. There will be a supporting website for the unit providing additional readings, links and materials. Lectures will also be available through Echo in iLearn from the following website link: http://ilearn.mq.edu.au

Students are required to participate in small group activities, whole class discussion, to read the weekly material in advance, and to complete brief tasks either as individuals or in pairs. The weekly program for the course with the accompanying readings/ preparation is available on the following pages or on the unit ILearn site.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- Special Consideration Policy *(**Note:** The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

Students seeking more policy resources can visit the Student Policy Gateway (https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit Policy Central (https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/study/getting-started/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) 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 or if you are a Global MBA student contact globalmba.support@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 help you improve your marks and take control of your study.

- Getting help with your assignment
- Workshops
- StudyWise
- Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

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

If you are a Global MBA student contact globalmba.support@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.