EDST2140

STEAM Integration in the Early Years

Session 2, In person-scheduled-weekday, North Ryde 2023

Macquarie School of Education

Contents

General Information

Unit convenor and teaching staff
Convenor
Carolyn Palmer
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Wally's Walk 29, Room 348
by appointment

Fay Hadley
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Credit points
10

Prerequisites
40cp at 1000 level or above including ECHE1130 or ECH113

Corequisites

Co-badged status

Unit description
This unit explores the integration of science, technology, engineering, arts and mathematics (STEAM) in the early years of education (birth-eight). Students will gain understanding of the underlying pedagogies when engaging with STEAM, will learn to expand curriculum opportunities in formal and informal contexts (e.g. Maker spaces; Museums) and also differentiate their teaching strategies depending on the age and other important characteristics of their children/students. Contemporary methods of assessment, evaluation and documentation appropriate for young children will also be explored. Students will have the opportunity to design and implement their own educational resource with a focus on STEAM.

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: Describe the major theoretical developments in early childhood arts, mathematics, science and technology education.

ULO2: Critically engage with and reflect on research of how young children understand and progress in their mathematical, scientific and technological thinking, starting from birth.

ULO3: Design, implement and evaluate effective teaching resources and learning environments using knowledge of the Early Years Learning Framework and the Primary Syllabuses (K-2) (ACARA/NESA).

ULO4: Integrate digital technologies, arts and design principles within effective teaching and learning strategies to expand learning opportunities for children in arts, mathematics, science and technology education.

ULO5: Critically analyse and demonstrate safe and ethical use of digital technologies in planning and teaching as a responsible local and global citizen.

General Assessment Information

- Students should be aware of and apply the University policy on academic honesty (see: https://policies.mq.edu.au/document/view.php?id=3)

- Unless a Special Consideration (see: https://students.mq.edu.au/study/assessment-exams/special-consideration) request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a mark of, 0 (zero) will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11:55pm. A 1-hour grace period is provided to students who experience a technical issue.This late penalty will apply to non-timed sensitive assessment (incl essays, reports, posters, portfolios, journals, recordings etc).

- Late submission of time sensitive tasks (such as tests/exams, performance assessments/presentations, scheduled practical assessments/labs etc) will only be addressed by the unit convenor in a Special consideration application. Special Consideration outcome may result in a new question or topic.

- Please format assessments using 12-point font and 1.5 spacing.

- All assessments are submitted electronically. Turnitin plagiarism detection software is used to check all written assessments.

- Students can use Turnitin's Originality Report as a learning tool to improve their academic writing if this option is made available in the unit.

- Students should carefully check that they submit the correct file for an assessment as no

re-submissions will be accepted after the due date and time, including instances where students upload an incorrect file in error.

- Word limits are strictly applied. Work above the word limit will not be marked.

- All assessments are marked using a clear marking rubric.

- Marking of all assessments is moderated by the Unit Convenor.

- Applications for extensions must be made via AskMQ (https://ask.mq.edu.au/).

- It is not the responsibility of unit staff to contact students who have failed to submit assessments. If you have any missing items of assessment, it is your responsibility to make contact with the unit convenor.

- In relation to AI gaits, such as, but not limited to ChatGPT. Students should take care with research conducted by AI, and instead use the set text, readings, and independent research from academic sources to inform their ideas. It is not acceptable to submit work generated by gaits, and work submitted should not include content generated by third parties or artificial intelligence sources. Students are encouraged to keep records of their downloads, notes, and drafts as evidence of their research. Any student suspected of breaching this will be referred to the university academic integrity unit.

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. For Professional Experience units the PE Report is marked as satisfactory or unsatisfactory and the Teaching Performance Assessment (in final PE units) is marked as not meets, meets or exceeds. 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.

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 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 your course progression.

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
Development of STEAM learning plans	50%	No	23:55 04/09/ 2023
STEAM resource and learning experience development	50%	No	23:55 27/10/ 2023

Development of STEAM learning plans

Assessment Type [1]: Learning plan
Indicative Time on Task [2]: 30 hours
Due: **23:55 04/09/2023**
Weighting: **50%**

The purpose of this assignment is to develop your knowledge and skills in observing, assessing and planning STEAM learning experiences for young children (birth-five years) in the early years. (1800 words)

On successful completion you will be able to:

- Describe the major theoretical developments in early childhood arts, mathematics, science and technology education.
- Critically engage with and reflect on research of how young children understand and progress in their mathematical, scientific and technological thinking, starting from birth.
- Design, implement and evaluate effective teaching resources and learning environments using knowledge of the Early Years Learning Framework and the Primary Syllabuses (K-2) (ACARA/NESA).

STEAM resource and learning experience development

Assessment Type [1]: Project
Indicative Time on Task [2]: 30 hours
Due: **23:55 27/10/2023**
Weighting: **50%**

The purpose of this assignment is to develop your knowledge and skills in designing and planning a STEAM educational project for young children in the early years. (1800 words).

On successful completion you will be able to:

- Integrate digital technologies, arts and design principles within effective teaching and learning strategies to expand learning opportunities for children in arts, mathematics,

science and technology education.

- Critically analyse and demonstrate safe and ethical use of digital technologies in planning and teaching as a responsible local and global citizen.

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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

This unit has a full web presence through iLearn.

Students will need regular access to a computer and the Internet to complete this unit. Students enrolled for online classes will also need a functioning web camera. Students will be required to have their cameras on for the online classes as this supports engagement. If students do not have this technology, they should enrol in the face-to-face classes.

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.

Electronic links and suggested references will be included in the Resources section. Please check the iLearn unit regularly.

The unit comprises one lecture (prerecorded) and one two-hour tutorial for internal students and external students. Weekly lectures are available on the web through the ECHO360 lecture component. This unit does not have 'live' lectures.

PowerPoint slides are available in iLearn in advance of the weekly lecture.

Students will access the required readings from the Leganto link on the unit iLearn page and engage in independent research. These are essential for successful completion of the assessments.

Tutorials begin in Week 1 of Session. In the tutorial, students will discuss issues and questions arising from the lectures and prescribed readings. Students are required to participate in small group activities, whole class discussion, and to read the weekly material in advance. Students are expected to base their arguments/ discussions on evidence from published research and other relevant material.

Attendance at all tutorials is expected and the roll will be taken. Students are required to attend the tutorial in which they are enrolled. Any changes to tutorial enrolments must be completed officially through e-student. Please do not contact the unit convenor requesting a change.

Access and technical assistance

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

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

Assistance is available from IT Helpdesk

Ph: 9850 4357 or 1800 67 4357

Log a request: help.mq.edu.au.

On Campus: Ground floor at 18 Wally's Walk

Structure

The unit structure can be found in the university timetable https://timetables.mq.edu.au/2023/

Unit Schedule

This is a unit overview, please see iLearn for further details.

Week and date	Activity	Topic
Week 1 **24/7/23**	Face-to-face and online weekly tutorials.	Introduction to STEAM
Week 2 **31/7/23**	Face-to-face and online weekly tutorials.	Early childhood mathematics
Week 3 **7/8/23**	Face-to-face and online weekly tutorials.	Early childhood science
Week 4 **14/8/23**	Face-to-face and online weekly tutorials.	Technology in the early years
Week 5 **21/8/23**	Face-to-face and online weekly tutorials.	Art education in the early years
Week 6 **28/8/23**	Face-to-face and online weekly tutorials.	Engineering in the early years

Week 7 **4/9/23**	Face-to-face and online weekly tutorials. **Assessment 1 due 4/9/23**	Play-based approach to STEAM
MQ Recess **11/9/23**	No classes. Students should catch up on lectures, readings, and research	
MQ Recess **18/9/23**	No classes. Students should catch up on lectures, readings, and research	
Week 8 **25/9/23**	Face-to-face and online weekly tutorials.	Project approach to STEAM
Week 9 (Public Holiday Monday) **2/10/23**	NO CLASSES Students should engage in independent research for the 2nd assignment.	
Week 10 **9/10/23**	Face-to-face and online weekly tutorials.	Planning and assessment for STEAM
Week 11 **16/10/23**	Face-to-face and online weekly tutorials.	STEAM integration
Week 12 **23/10/23**	Face-to-face and online weekly tutorials. **Assessment 2 due 27/10/23**	Makerspace in STEAM

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). 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
- Assessment Procedure
- Complaints Resolution Procedure for Students and Members of the Public
- Special Consideration Policy

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

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.e du.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/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

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing an d maths support, academic skills development and wellbeing consultations.

School of Education Procedures

In addition, the following policies and procedures of the School of Education are applicable in this unit.

Attendance for undergraduate units

See the university timetable for information about when classes begin in this unit. https://timetabl es.mq.edu.au/2023/

Activities completed during weekly tutorials (internal/DAY or ONLINE DAY mode) are essential for building the core knowledge and/or skills required to demonstrate the learning outcomes of this unit [and to meet the AITSL Graduate Teacher Standards and/or ACECQA requirements]. Attendance at all tutorials is expected and the roll will be taken. Make up tasks may be given if attendance is missed to ensure all content is covered to meet accreditation requirements.

Students are required to attend the tutorial in which they are enrolled. Any changes to tutorial enrolments must be completed officially through e-student. Please do not contact the unit convenor requesting a change.

Electronic Communication

It is the student's responsibility to check all electronic communication on a regular weekly basis. Communication may occur via:

- Official MQ Student Email Address

- The Dialogue function on iLearn

- Other iLearn communication functions

Fail Rule

General Coursework Rule 17 stipulates that where a student is enrolled in a practical, clinical or Professional course with fitness to practice requirements:

- if a student fails one practical, clinical or professional activity they may be permanently excluded from that course; or

- if a student fails an essential unit twice or fails the equivalent of 20 credit points they may be permanently excluded from further enrolment in that course.

Students completing a double degree will be able to continue with their other degree program provided they meet the academic progression requirements of the Academic Progression Policy.

Students completing a single Education degree (such as the BTeach/MTeach) are advised to seek academic advice.

Student Support

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

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the 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

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault
- Social support including information about finances, tenancy and legal issues
- Student Advocacy provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

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.

5Rs Framework

The 5Rs Framework, developed by the School of Education at Macquarie University, is embedded throughout your teacher education course.

Your use of the 5Rs Framework will help you develop the capabilities that will make your teaching career sustainable and fulfilling.

In this unit, you will learn using the 5Rs framework in the following important ways:

Resilience: Understanding and identifying personal attitudes towards STEAM education. Challenging pre-existing STEM education. Building conceptual and procedural understandings to bolster confidence.

Reflexive: Strong understanding of theory to underpin pedagogy. Understanding broader implications of technology and how this influences teaching and learning decisions.

Responsive: Building passion, interest and enthusiasm for STEAM learning and developing strategies for supporting this with young children and families.

Recognising how children's interest in STEAM areas is an important as an impetus for curriculum planning/ implementation.

Ready to learn: Reinforcing the teacher's role as a facilitator and co-learner, learning alongside children on integrated STEAM content. Understanding technology as tool for teaching and learning.

Research engaged: Drawing on research publications and research to understand teaching and learning relating to STEAM.

Changes since First Published

Date	Description
13/07/2023	Order of assessments changed. Early years (0-5 years) assessment now first.

Unit information based on version 2023.03 of the Handbook