EDCU20038 *Teaching Science*
Term 1 - 2021

Profile information current as at 19/04/2024 08:38 am

General Information

Overview

This unit develops understanding of both the content and pedagogy required to teach science in primary school classrooms. Students are introduced to concepts on how children learn science, the importance of science education in an Australian and international context and current views regarding effective pedagogical practice linked to research. Practical application of skills related to the Australian Curriculum: Science will focus on learning and teaching across the four substrands of Biological Sciences; Earth and Space Sciences; Chemical Sciences and Physical Sciences. There is an emphasis on science inquiry skills, in particular identifying and posing questions; planning, conducting and reflecting on investigations; processing, analysing and interpreting evidence; and communicating findings. The unit includes an emphasis on effective student engagement within science education through the appropriate selection, application and assessment of science content knowledge.

Details

Career Level: *Postgraduate*
Unit Level: *Level 9*
Credit Points: *6*
Student Contribution Band: *7*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Co-requisite EDFE20034 Professional Praxis 1: Learning, Teaching and Planning
Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the Assessment Policy and Procedure (Higher Education Coursework).

Offerings For Term 1 - 2021

- Online

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Postgraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

Regional Campuses
Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

Metropolitan Campuses
Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Written Assessment**
Weighting: 50%
2. **Written Assessment**
Weighting: 50%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the University's Grades and Results Policy for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the CQUniversity Policy site.
You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the CQUniversity Policy site.

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Student Evaluation.

Feedback
The variety of assessment samples provided were invaluable for understanding how to approach the tasks.

Recommendation
Continue to provide assessment samples.

Feedback from Lecturer reflection.

Feedback
Two prescribed text books can be costly for students.

Recommendation
Remove second prescribed text.

Unit Learning Outcomes

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

1. Evaluate examples of teaching and assessment practice in science education to identify how connections are made to students' prior knowledge or experience to promote learning
2. Access and apply professional literature on contemporary science education to critically evaluate or justify planning and assessment practices
3. Plan lesson sequences that use appropriate research-based teaching strategies and ICTs to structure content and address students' possible misconceptions in science education
4. Develop diagnostic, formative and summative assessment tools that identify students' understanding of scientific phenomena
5. Select teaching and learning and assessment strategies that engage students in active learning, promote higher order thinking and scaffold students' understanding of core concepts in science

Successful completion of this course provides opportunities for students to demonstrate the Australian Professional Standards for Teachers focus areas of:
1.1 Physical, social and intellectual development and characteristics of students.
1.2 Understand how learners learn
2.1 Content and teaching strategies of the teaching area
2.2 Content selection and organisation
2.3 Curriculum, assessment and reporting
2.6 Information and Communication Technology (ICT)
3.2 Plan, structure and sequence learning programs
3.3 Use teaching strategies
3.4 Select and use resources
3.6 Evaluate and improve teaching programs
4.1 Support student participation
5.1 Assess student learning
5.3 Make consistent and comparable judgements
5.4 Interpret student data
5.5 Report on student achievement

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level | • Introductory Level | • Intermediate Level | • Graduate Level | ◦ Professional Level | ◦ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Written Assessment - 50%	•	•	•	•	
2 - Written Assessment - 50%	•	•		•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
1 - Knowledge	◦	◦	◦	◦	◦
2 - Communication	◦	◦	◦	◦	◦
3 - Cognitive, technical and creative skills	◦	◦	◦		◦
4 - Research		◦			
5 - Self-management	◦			◦	
6 - Ethical and Professional Responsibility	◦	◦	◦	◦	◦
7 - Leadership					
8 - Aboriginal and Torres Strait Islander Cultures					

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes							
	1	2	3	4	5	6	7	8
1 - Written Assessment - 50%	◦	◦	◦	◦	◦	◦		
2 - Written Assessment - 50%	◦	◦	◦		◦	◦		

Textbooks and Resources

Textbooks

EDCU20038

Prescribed

Connecting with science education
Edition: 2nd (2018)
Authors: Gregson, Robyn
Oxford
Melbourne , VIC , Australia
ISBN: 9780190309343
Binding: Paperback

Additional Textbook Information
Paper and eBook versions of the text are available at the CQUni Bookshop here: http://bookshop.cqu.edu.au (search on the Unit code)

View textbooks at the CQUniversity Bookshop

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

Referencing Style

All submissions for this unit must use the referencing style: American Psychological Association 7th Edition (APA 7th edition)
For further information, see the Assessment Tasks.

Teaching Contacts

Linda Pfeiffer Unit Coordinator
l.pfeiffer@cqu.edu.au

Schedule

Week 1 - 08 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Theoretical frameworks in science	Gregson (2018) Chapters 1 - 3	

Week 2 - 15 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Curriculum design	Gregson (2018) Chapter 4	

Week 3 - 22 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Learning and teaching scientifically	Gregson (2018) Chapter 5	

Week 4 - 29 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Engagement strategies	Gregson (2018) Chapter 6	

Week 5 - 05 Apr 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Scientific literacy	Gregson (2018) Chapter 7	**Scientific concepts and misconceptions** Due: Week 5 Wednesday (7 Apr 2021) 11:45 pm AEST
Vacation Week - 12 Apr 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Week 6 - 19 Apr 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Assessment in science	Gregson (2018) Chapter 8	
Week 7 - 26 Apr 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
STEM approaches to learning	Materials provided on the Moodle site	
Week 8 - 03 May 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Biological sciences	Gregson (2018) Chapter 10	
Week 9 - 10 May 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Chemical sciences	Gregson (2018) Chapter 11	
Week 10 - 17 May 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Earth and space sciences	Gregson (2018) Chapter 12	
Week 11 - 24 May 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Physical sciences	Gregson (2018) Chapter 13	
Week 12 - 31 May 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
		Evaluation of two science units Due: Week 12 Monday (31 May 2021) 11:45 pm AEST
Review/Exam Week - 07 Jun 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Exam Week - 14 Jun 2021		
Module/Topic	**Chapter**	**Events and Submissions/Topic**

Assessment Tasks

1 Scientific concepts and misconceptions

Assessment Type
Written Assessment

Task Description
People have alternate conceptions or misconceptions about the scientific world. People think about what they do and see, building shared explanations of how objects and events work. The building of these ideas can often result in misconceptions about how the world works.
Part A Case Study: Through research, select a scientific concept taught in one of the strands of the Australian Curriculum

Science that is commonly misunderstood or poorly understood. Misconceptions can often be found in the media or during conversations with children. Identify a learner context you will be working within: either Prep to Year 3 learners or Year 4 to Year 6 learners. Design a diagnostic tool that uses questioning to critically analyse the understanding that these learners have about your selected concept. This simply means 'how did you find out?' and can be as simple as questioning. Other examples include drawing, classwork or even overhearing children's discussions. Include examples and a comparison of the language used by the different learners to explain this science concept.
Part B Correcting Misconception: Develop a learning sequence that works to correct the misconception identified during your questioning in Part A. The pedagogy used in your learning sequence must be linked to current research on effective teaching and learning practice and take account of the cognitive and language characteristics of the learners in the chosen age group. The learning sequence should use ICTs where appropriate. You need to include a range of teaching strategies. Outline how you would report your findings to students and parents/carers.
Word limit - 3,000 words

Assessment Due Date
Week 5 Wednesday (7 Apr 2021) 11:45 pm AEST

Return Date to Students

Feedback on this assessment response will be provided in sufficient time to allow for academic support and advice as necessary to inform students' responses to the next task.

Weighting
50%

Assessment Criteria
1. Explicit identification of scientific concept and learner context.
2. Comprehensive diagnostic tool developed including examples of the language surfaced from using the tool.
3. Deep knowledge and understanding of the correct scientific concept and explicit connections between the misconception and the correct scientific concept.
4. Extensive learning sequence based on contemporary research on effective learning and teaching practice including reporting findings and appropriate use of ICT.
5. Cohesive writing consistent with academic conventions. Extensive use of relevant and credible sources.
The full rubric for this assessment task can be downloaded from the Moodle site for this unit.

Referencing Style

- American Psychological Association 7th Edition (APA 7th edition)

Submission
Online

Learning Outcomes Assessed

- Evaluate examples of teaching and assessment practice in science education to identify how connections are made to students' prior knowledge or experience to promote learning
- Access and apply professional literature on contemporary science education to critically evaluate or justify planning and assessment practices
- Plan lesson sequences that use appropriate research-based teaching strategies and ICTs to structure content and address students' possible misconceptions in science education
- Develop diagnostic, formative and summative assessment tools that identify students' understanding of scientific phenomena

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Self-management
- Ethical and Professional Responsibility

2 Evaluation of two science units

Assessment Type
Written Assessment

Task Description
Examine two units of science work taught in a primary school for a particular year level. In light of current research around effective practice in assessment in Science, evaluate formative and summative assessment used in these units

of work. Identify the types of assessment used, how they demonstrate student understanding and motivate or engage students in learning. Make at least two recommendations for improvement in the assessment used in these units of work using the knowledge you have gained throughout the course of assessment for, of and as learning. These recommendations must be justified by links to current research and should include redesign or development of appropriate tools and techniques for promoting engagement and making reliable consistent and comparable judgements on students' learning as input for teaching and reporting purposes.
Word limit - 3,000 words

Assessment Due Date
Week 12 Monday (31 May 2021) 11:45 pm AEST

Return Date to Students

Weighting
50%

Assessment Criteria
1. Sophisticated explanation of the diagnostic, formative and summative assessments used in each of the two units and identification of assessment for, of or as learning.
2. Comprehensive explanation of how the types of assessment used in the two units of work demonstrate student understanding and motivate or engage students in their own learning.
3. Two appropriate recommendations are identified for improvement in the assessment items of each of the two units (four in total) and justified by links to current research.
4. Cohesive writing consistent with academic conventions. Extensive use of relevant and credible sources.
The full rubric for this assessment task can be downloaded from the Moodle site for this unit.

Referencing Style

- American Psychological Association 7th Edition (APA 7th edition)

Submission
Online

Learning Outcomes Assessed

- Evaluate examples of teaching and assessment practice in science education to identify how connections are made to students' prior knowledge or experience to promote learning
- Access and apply professional literature on contemporary science education to critically evaluate or justify planning and assessment practices
- Develop diagnostic, formative and summative assessment tools that identify students' understanding of scientific phenomena
- Select teaching and learning and assessment strategies that engage students in active learning, promote higher order thinking and scaffold students' understanding of core concepts in science

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Self-management
- Ethical and Professional Responsibility

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the **Student Academic Integrity Policy and Procedure**. This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?
A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?
A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?
For academic advice and guidance, the Academic Learning Centre (ALC) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?

Be Honest
If your assessment task is done by someone else, it would be dishonest of you to claim it as your own

Seek Help
If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)

Produce Original Work
Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem