Description: Problem Solving as a Constructivist Vehicle in Learning Science/Mathematics

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
<th>Campus</th>
</tr>
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<tr>
<td>EDU</td>
<td>5421</td>
<td>38288</td>
<td>3, 2004</td>
<td>WEB</td>
<td>1.00</td>
<td>TW MBA</td>
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Academic group: FOEDU
Academic org: FOE003
Student contribution band: 1
ASCED code: 079999

STAFFING
Examiner: John Green
Moderator: Bruce Waldrip

RATIONALE
By contrast with the more traditional view of instruction as a process involving the transmission of facts from an active teacher to a passive student, constructivists believe that learning occurs through a process in which the student plays an active role in constructing the set of conceptual structures that constitute his or her own knowledge base. Constructivist curricula often emphasise group activities designed in part to facilitate the acquisition of collaborative skills of the sort that are often required within contemporary work environments.

SYNOPSIS
This course will investigate problem-solving activities that may offer students of varying ages and ability levels, and having different interests and prior experience, the opportunity to teach each other -- a mode of interaction that has been found to offer significant benefits to both tutor and tutee. Explicit attention is also given to the cultivation of higher-order thinking skills, the acquisition of knowledge about how to learn, and how to recognize and "debug" faulty mental models. NOTES: 1. This course is available through INTERNET (WEB) DELIVERY ONLY. 2. There are NO print materials for this course. 3. For details of the technical requirements and accessing Internet study materials, please consult the following URL: http://usqconnect.usq.edu.au

OBJECTIVES
On completion of this course students will be able to:

1. understand the parameters that define a problem in the classroom;
2. understand the history of problem solving;
3. understand the contribution of problem solving to learning and teaching;
4. utilise a problem solving approach to teaching so that understanding in science and mathematics is enhanced;
5. understand the problem solving process and solve apparently difficult problems in authentic learning situations.

**TOPICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>Definition of a Problem</td>
<td>20.00</td>
</tr>
<tr>
<td>1. The role of problem solving</td>
<td></td>
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<tr>
<td>Teaching ABOUT Problem Solving</td>
<td>30.00</td>
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<tr>
<td>2.1. Teaching FOR problem solving</td>
<td></td>
</tr>
<tr>
<td>2.2. Teaching THROUGH problem solving</td>
<td></td>
</tr>
<tr>
<td>The Problem Solving Process</td>
<td>50.00</td>
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<tr>
<td>3.1. Construction of concepts through problems</td>
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</table>

**TEXT and MATERIALS required to be PURCHASED or ACCESSED:**

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at http://bookshop.usq.edu.au click 'Semester', then enter your 'Course Code' (no spaces).

**REFERENCE MATERIALS:**

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.


STUDENT WORKLOAD REQUIREMENTS:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Assessment</td>
<td>50.00</td>
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<tr>
<td>Directed Study</td>
<td>40.00</td>
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<tr>
<td>Private Study</td>
<td>70.00</td>
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ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks out of</th>
<th>Wtg(%)</th>
<th>Due date</th>
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<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>100.00</td>
<td>30.00</td>
<td>17 Dec 2004</td>
</tr>
<tr>
<td>PROJECT</td>
<td>100.00</td>
<td>70.00</td>
<td>28 Jan 2005</td>
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IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:
   There are no attendance requirements for this course. However, it is the students' responsibility to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

2 Requirements for students to complete each assessment item satisfactorily:
   To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available for each assessment item.

3 Penalties for late submission of required work:
   If students submit assignments after the due date without prior approval then a penalty of 10% of the total marks available for the assignment will apply for each working day late.

4 Requirements for student to be awarded a passing grade in the course:
   To be assured of receiving a passing grade a student must submit all of the summative assessment items and achieve at least 50% of the available weighted marks for the aggregate of those items.

5 Method used to combine assessment results to attain final grade:
   The final grades for students will be assigned on the basis of the weighted aggregate of the marks obtained for each of the summative assessment items in the course.

6 Examination information:
   There is no examination in this course.

7 Examination period when Deferred/Supplementary examinations will be held:
   There will be no Deferred or Supplementary examinations in this course.

8 University Regulations:
   Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL...
ASSESSMENT NOTES

1 The due date for an assignment is the date by which a student must despatch the assignment to USQ. The onus is on the student to provide proof of the despatch date, if requested by the examiner.

2 Students must retain copies of each item submitted for assessment. A copy must be produced within five days if required by the examiner.

3 The examiner may grant an extension of the due date of an assignment in extenuating circumstances.

4 In the event that a due date for an assignment falls on a local public holiday in a student’s area, such as a show holiday, the due date for the assignment will be the next day. Students are to note on the assignment cover the date of the public holiday, for the examiner’s information.

5 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of the course within the normally prescribed time, may be awarded the temporary grade of IM (Incomplete-Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non-directed personal study.

6 Students who, for medical, family/personal or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time, may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded: IDS (Incomplete - Deferred Examination), IDM (Incomplete - Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).

7 When there is more than one marker for a single item of assessment, the distributed patterns and means for the different markers will be compared and marks adjusted if necessary.

8 The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media, except for ONLINE courses.

9 Marking criteria will depend upon the nature of individual projects. Marking criteria are provided in course materials as mark sheets/guides, or as part of assignment specifications.

10 Students workload requirements are as required for the completion of the study and as negotiated between student and supervisor.

11 All assessment items must be submitted.

12 Summative assessment items will receive a numerical score. The course examiner is responsible for awarding grades.
OTHER REQUIREMENTS

1. Students will require access to email and Internet access to USQConnect for this course.