Creating Conceptual Capacity in Accounting through Intelligent Tutoring

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Presentation Outline

• Introduction
• Intelligent Tutoring Systems
• iCFS Conceptual Design
• Where to from here?
Introduction

- The delivery of conceptual understanding has traditionally occurred through face-to-face tuition.

- Problem with traditional educational approaches - do not offer individualised instruction.

- The curriculum and overall benefit of the group dictate the pace.

- This presents an explicit challenge for academics, in particular, in disciplines with large student cohorts, varying in size from 300 to 1000 students.

- Meeting the individual learning support needs of students requires an innovative solution.
Teaching experience shows that the principles, preparation and decision-making associated with Cash Flow Statements (CFS), is problematic for students to master.

Students are so conditioned to the principles of accrual accounting that they often show major difficulties in the application of cash accounting.

Lucas and Mladenovic (2006) have suggested that accrual vs cash may indeed constitute a threshold concept within the introductory accounting curriculum.

CFS play a crucial role in investor decisions by indicating an organisation’s ability to generate cash flows. The importance of CFS is further evidenced through inadequate cash funds still proving to be the number one cause of business failure in Australasia (Featherstone, 2011).
Intelligent Tutoring Systems

• In order to provide “human-like” tutoring, a computer system must be intelligent enough to evaluate and model students’ knowledge.

• The ITS provides a computer-based problem-solving environment for CFS.

• The system tracks the student’s performance, and generates a model of the student’s knowledge, which is used to adapt the instructional session to the needs and abilities of each student.

• The system offers students’ personalised feedback catered towards their particular level and ability. It is for this reason that the online tutor assists in motivating students in their learning, providing feedback at each crucial step along the way.

• ITSs have proven their effectiveness not only in controlled lab studies but also in real classrooms (Koedinger et al. 1997; Mitrovic et al. 2004, 2007).
iCFS Conceptual Design

- Envisaged that iCFS would enable students to apply theoretical CFS decision-making to ‘real-life’ simulated business environments.
- Based on International Accounting Standard (IAS) 7 'Statement of Cash Flows' (or the national equivalent).
- iCFS provides an easy-to-use system that will adapt to students’ individual needs and learning abilities.
iCFS Conceptual Design

Cash Flow Statement

Operating activities

Cash receipts from customers

Dividends payable

Statement of Financial Position as at 30-Jun

2013 | 2014
---|---
Current assets | $ | $ |
Petty cash/cash at bank | 5,600 | 4,800 |
Deposits at call/bank bills | - | - |
Accounts receivables | 106,000 | 156,200 |
Allowance for doubtful debts | - | - |
Inventories | 564,400 | 525,200 |
Financial assets held for trading | - | - |
Interest receivable | - | - |

Statement of Comprehensive Income for the year ended 30-Jun 2014

Sales | 5,317,960 |
(Discounts allowed) | - |
(Cost of sales) | (3,752,000) |
Discounts received | - |
Gross profit | 1,565,960 |
Interest income | - |
Dividend income | - |
Share of profit/(loss) of associates | - |
Gain/(loss) on sale of PPE and other intangibles | 9,000 |

Help
In this task, you need to determine all values needed for CSF. Fill in the working table and save the solution whenever you need. Click the Check button for the system to analyze your answer. If your solution is correct, click the Done button to continue.
iCFS Conceptual Design

- Students are provided predefined CFS case problems and are able to solve these in parts.
- Cases are designed to encompass varying skill complexity.
  - 5 problem areas with increasing requirements
  - 7 difficulty levels with an increasing complexity of accounting transactions.

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<th>easiest</th>
<th>easy</th>
<th>still relatively easy</th>
<th>medium</th>
<th>Relatively challenging</th>
<th>challenging</th>
<th>most challenging</th>
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- Learners can choose a combination of problem area and difficulty level according to the table above.
iCFS Conceptual Design

• To be adaptive, iCFS maintains a model for each student.

• The iCFS model contains information about a student’s knowledge and system interactions during previous sessions (i.e. a list of problems solved correctly).

• The system will track a student’s progress, and offer help and advice at a level that is appropriate to their knowledge.
iCFS Conceptual Design

• Currently being developed over a period of 6 months.

• Development team based on both sides of the Tasman so conceptual design has taken place through combined Face-to-face and Skype discussions.

• Pilot trials are planned with student groups and academic staff to provide feedback on the learning experience, design of user interface and teaching and facilitation practicalities.

• Implementation is scheduled for September - November 2013.
Where to from here?

• Currently constructing a database of case problems ranging in level of complexity.

• Completing construction and programming of iCFS.

• Pilot and implementation trials through July – November both at UC (NZ) and MQ (Australia).

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References


