Transforming students’ approaches to learning and applying mathematics

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Overview

• Learning Strategies
• Role of ICT
• CRSP Integrated course
• Mathematics Skill Deficiencies
• Addressing deficiencies
• Transferable skills
• Research Findings
Setting the scene...

• Higher Colleges of Technology, Dubai Men’s College
• Foundations year
• Research Skills & Projects with COMP100 (CRSP)
Learning Strategies

- Learning in real-world contexts
- Analysis and interpretation tasks
- Transferable skills
- Small group work
- Investigational work
- Problem solving

CRSP
ICT: Scaffolding learning strategies

CRSP: Scaffolding; Outcomes; Skills

- Scaffolding / outcomes
- WebCT calendar
- Laptop computers
- Scaffolding / outcomes
Laptops: Scaffolding/Outcomes

- problem solving
- analysing
- evaluating
- creating
- applying
- understanding
- synthesising
- predicting
- responding
- characterising
- categorising
- interpreting/comparing

- higher-order thinking skills

- collect and collate original research data outside classrooms
- communication
- collaboration/cooperation
- file naming conventions
- file management
- anti-virus protection
- global awareness raising
- backups

- Laptop computers
- scaffolding/outcomes
WebCT calendar: Scaffolding/Outcomes

Is this slide necessary?
Despite some collaboration, over time, each course had developed increasingly into a ‘realm’ unto itself.

**Issues:**
- student workloads
- application of skills
- development of higher order thinking skills
- assessment
28 March, 2007

Research Skills and Projects

English

Arabic

Computer

Math

Learner independence

Awareness

Assessment

Consolidation

ICT Learning Strategies
Mathematical skill deficiencies

- problem solving skills,
- math terminology in English,
- language structure and grammar of word problems,
- analysing skills to produce correct answers,
- employing self-directed study skills, and
- adopting different learning strategies to address new mathematical ideas and concepts
Careers Project: Applied Math Skills Tasks

- Off-campus survey
- Podcast
- Article analysis and quiz
- Decision Analysis

Math deficiencies
Computer Skills
Active Learning Strategies
PART 1: Understanding & using your data to give suggestions & opinions

Question 1

a. How many of the interviewees are doing / have done training courses at work?

b. What are the most common types of training courses?

c. List the main reasons why they are useful.
   •
   •
PART 2: Collect, record & display data in spreadsheets & charts

1. Make an Excel spreadsheet detailing the range of nationalities of your group’s interviewees. See the example below:

<table>
<thead>
<tr>
<th>Nationality</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emirati</td>
<td>4</td>
</tr>
<tr>
<td>Australian</td>
<td>1</td>
</tr>
<tr>
<td>British</td>
<td>5</td>
</tr>
<tr>
<td>South African</td>
<td>2</td>
</tr>
</tbody>
</table>

2. Using this spreadsheet, create a pie chart to show the percentage of each nationality. Include a title and data labels. Paste this chart below:
1. List the jobs that the six students said they would like to do after college in the table below. Also list why they want to do these jobs (note form only). The first one is done for you.

<table>
<thead>
<tr>
<th>Job</th>
<th>Reason Why</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering – Aviation</td>
<td>Parents would like me to do it</td>
</tr>
</tbody>
</table>

2. Look at the reasons why students want to go into different industries/jobs. Paraphrase the answers given by students to make a list of job considerations? The first one is done for you.
Officials attack inability to tackle unemployment woes
By Alia Al Thahb, Staff Reporter

The Labour Ministry's handling of the UAE national unemployment problem was heavily criticized by top officials over the weekend.

"The job of the labour minister is to prepare plans to employ nationals and reduce unemployment. His job is not to prepare visas for foreigners," said Lieutenant General Dahi Khalfan Tamim, Dubai Police Chief.

Local markets should be freed from exploitation creating more job opportunities for nationals. Lieutenant General Dahi said the number of unemployed nationals increased from 8,000 in 1995 to 24,000 in 1999 to 30,000 in 2003, and 35,000 in 2005.

Emiratisation in the federal government is 54 per cent, and in the local government it is 15 per cent, while the percentage of nationals in the private
Decision Analysis – HD Course

Read Ali’s 'career needs". Then listen to information about three possible career choices for him. Use your considerations list to decide which course is best for him.

Ali enjoys maths, hands-on activities & is doing well at English. He is an organised, sociable person who enjoys problem solving & likes working with people; last summer Ali helped his older brother at DEWA who sponsored his studies. However, Ali thinks he would like to work in the private sector.

**Business** seeks students with good organisational skills, who pay attention to detail, like working with numbers & are able to communicate well in English. Career opportunities include banks, accounting firms, insurance & financial companies & the government.

**Comm Tech** seeks students who enjoy working with photography, video & graphics, computers & like working as part of a team. Career opportunities include television broadcasting, web & graphic design, public relations & advertising.

**Engineering** seeks students who like building, solving technological problems, enjoy working hands-on and who like to fix & improve things for other people. Employment opportunities include government agencies such as DEWA, as well as oil companies and construction firms, eg Emaar.
Transferring Skills – Math 070

Read Ali’s "business premises needs". Then listen to information about three possible choices for his business. Use your considerations list to decide which premises is best for him.

Ali plans to sell mobile phones. His budget is 5 000 dirhams per month. He requires at least 200 square feet of space. Using your considerations, decide which of the following premises is the most suitable.

**Lamcy Plaza.** The premises in Lamcy Plaza are brand new. There is 900 square feet of space in a prime location. Rent is Dhs 200 per square foot. Parking is available for customers and it’s right next door to all Lamcy Plaza attractions.

**Bur Dubai.** You’ll like this shop in Bur Dubai. Right in the middle of Bank Street, it has 300 square feet of space with rent at Dhs 160 per square foot. Parking spaces are available and you’re near Spinneys and all the computer shops.

**Karama.** This place in Karama has an area 250 square feet. It’s in a very good shopping centre and rent is only Dhs 65,000 per year. Parking is available and you’re right near the markets and the bus stop.
Anecdotal feedback

- Students felt more enjoyment for learning mathematics
- Students preferred instruction that provided practical applications of ‘real world mathematics’
- Faculty believe that the active learning integrated environment provides students with a unique opportunity to learn in a much broader context
Conclusion

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• Research Findings
Thank-you for listening

• Are there any questions?