

Stage 6 IPT syllabus support

Supporting syllabus changes in
Information Processes and Technology

Presentation notes

Technology Unit, Curriculum K–12 Directorate
< <http://www.curriculumsupport.education.nsw.gov.au/> >



Supporting IPT syllabus changes

Presented by
Tim Gorrod



Technology Unit Curriculum K-12 Directorate



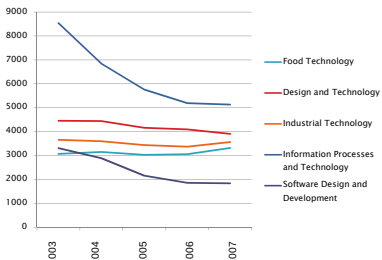
Session 1

Review the syllabus

The aim of this session is to:

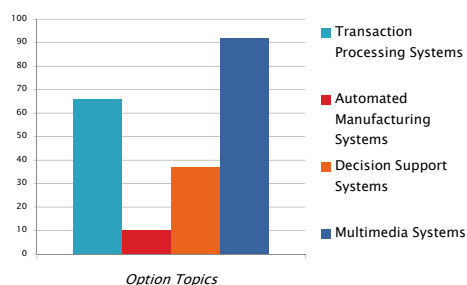
- ▶ overview the changes to the syllabus and the support document
- ▶ identify resources that you may use to support the changes.

Some interesting HSC data...



Year	Food Technology	Design and Technology	Industrial Technology	Information Processes and Technology	Software Design and Development
2003	8500	4500	3500	3000	3000
2004	7000	4300	3300	2800	2800
2005	6000	4100	3100	2600	2600
2006	5500	4000	3000	2500	2500
2007	5000	3800	2800	2400	2400

Some interesting HSC data...



How did we get a new syllabus?

Board of Studies
Office of the
Board of Studies

- Develop syllabuses
- Set and mark exams
- Provide results

Department of Education and
Training... all public schools

Some directorates

- | Curriculum support | Information Technology | Strategic Initiatives |
|--|--|---|
| <ul style="list-style-type: none"> • Support syllabus delivery • Many resources, including this workshop | <ul style="list-style-type: none"> • Learning tools • Email • Filtering | <ul style="list-style-type: none"> • Policy • AGQTP • Awards |

Why was the syllabus amended?

- ▶ A strong feeling that there was:
 - *too much* content
 - some Preliminary material duplicated in HSC
 - a need for clarification
 - much new IT
 - a need to make *Communications Systems* more cohesive.

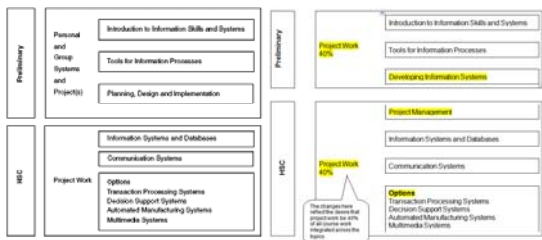
What has not changed

- ▶ The syllabus’s orientation around how information systems work and how they are developed.
- ▶ The project-based nature of the subject.
- ▶ Students are expected to be competent, confident, ethical users of IT.
- ▶ Much of the content, including IPT-specific terms.

What has changed?

- ▶ General nature of the changes
 - Update to include newer technologies
 - Minor adjustment to outcomes
 - Minor adjustment to the course structure
 - Changes to timing.
- ▶ Syllabus smaller
 - The *Specification* document is bigger because it can be updated more easily than the syllabus.

Course structure



Syllabus, page 10

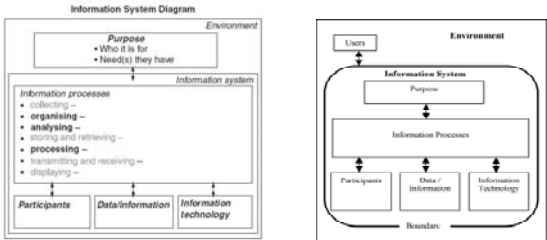
Objectives	Preliminary Outcomes	HSC Outcomes
Students will develop: 4. an understanding and appreciation of the emerging nature of information systems, technologies and processes within a historical context 5. skills in the selection and ethical use of appropriate resources and tools to support information systems 6. skills and techniques to creatively and methodically plan, design and implement information systems to address needs 7. skills in management communication and teamwork in relation to individual and group activities	PO1 describes the historical development of information systems and relates these to current and emerging technologies PO2 selects and ethically uses computer based and non-computer based resources and tools to process information PO3 analyses and describes an identified need PO4 generates ideas, considers alternatives and develops solutions for a defined need PO5 recognises, applies and explains management and communication techniques used in individual and team based project work PO6 uses ICT skills and technologies to support individuals and teams	HO1 proposes and justifies ways in which information systems will meet emerging needs HO2 justifies the selection and use of appropriate resources and tools to effectively design and manage projects HO3 assesses the ethical implications of selecting and using specific resources and tools, recommends and justifies the choice HO4 analyses situations, identifies needs, proposes and justifies solutions HO5 selects, justifies and applies methodical approaches to planning, designing or implementing solutions HO6 implements and explains effective management techniques HO7 uses methods to thoroughly document the development of individual and team projects

Syllabus, page 12

Preliminary course: Overview

- A summary:
- Strengthen the requirements relating to project work.
 - More time for 'Tools for Information Processes'.
 - The two topics 'Planning, Designing and Implementation' and 'Personal and Group Systems and Projects' have been replaced with one topic called 'Developing Information Systems'. This has been done to remove duplicated and irrelevant content and concepts, and to provide more time to integrate content into project work.

Preliminary course: Content

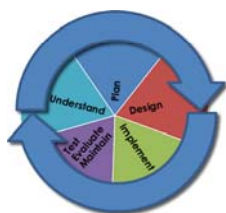


Preliminary course: New topic
Developing information systems

- ▶ Some content removed because it's treated in depth in the HSC course.
- ▶ Confusion about systems created *by* individuals and groups, or *for* individuals and groups has gone.

HSC course: Project Management

- ▶ System development cycle the same
- ▶ More detail provided.

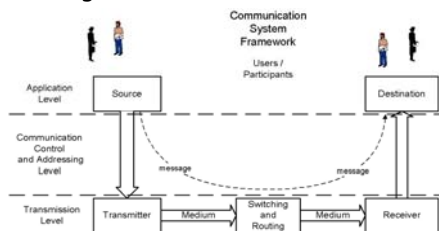


HSC course: Information systems and Databases

- ▶ Relationships now specified.
- ▶ Data dictionary changed.
- ▶ Query by example now specified, as well as Structured Query Language.

HSC course: Communication systems

► New diagram



A useful resource... the Open University in UK

<http://openlearn.open.ac.uk/mod/resource/view.php?id=175839>

HSC course: Communication systems

► New systems and hardware included, for example:

- Voice Over Internet Protocol
- Bluetooth
- Wireless Access Points and 3G network

► New issues included:

- RSS feeds
- Wikis, blogs
- Podcasts, vodcasts

Online transaction processing

OLTP refers to optimising databases to improve online performance.



According to <http://www.databasejournal.com>, this optimising consists of organising the data into layers.

- Presentation layer – the only thing that happens at the client's end
- Business logic layer – rules and procedures, optimised so that frequent requests are handled fast
- Data layer – all data needed to process transactions

Image from

<http://www.istockphoto.com>

Online analytical processing

OLAP is about analysing historical data with a view to extracting information from it.

In the past, this has been a slow process because properly normalised databases have data stored in discrete tables. It does this by pre-building sets of data based on a snapshot of the real database. File size blows out because the data is no longer normalised, but query speed is much higher.

More information available at

<http://www.ebroadcast.com.au/lookup/encyclopedia/ol/OLAP.html>

<http://office.microsoft.com/en-au/excel/HP101774371033.aspx>



► Online analytical processing

Drilling down refers to taking a generalised set of results and looking more deeply at a part of those results. For example, "The rainfall in May was relatively high" contains some information.

If you ask the question, "Did it rain all month or come in bursts?", you are drilling down.

Drilling down further could look at a day by day, hour by hour or minute by minute analysis of the rainfall.

There is a nice demonstration at

<http://www.quietlyscheming.com/blog/charts/chart-drilldown-animations/>

Image from

<http://www.fotosearch.com>

HSC Course: Transaction processing systems

New things here include:

- new backup and recovery techniques
- the inclusion of data warehousing and the inclusion of data mining
- enterprise systems.

HSC Course: Decision support systems

New things here include:

- ▶ more prominence for group decision support systems
- ▶ geographic information systems
- ▶ management information systems.

HSC Course: Multimedia

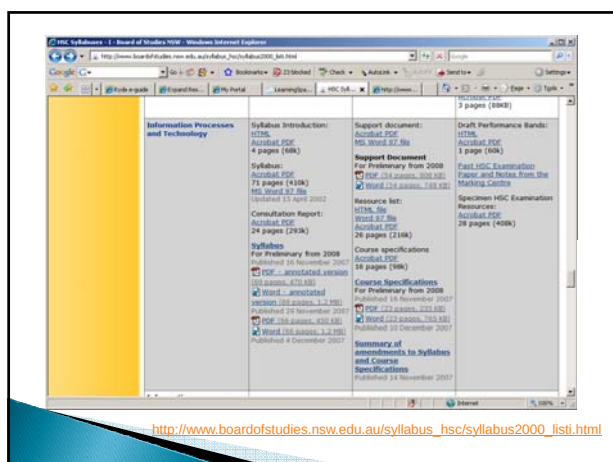
- ▶ Nearly all the changes have occurred in the *Course Specifications* document.
 - CRT, LCD, Plasma, touch screens, digital projectors
 - File formats specified include .swf for animation, .wma for audio

Where can I find resources?

- ▶ On the Board of Studies web site
 - annotated syllabus
 - course specifications
 - support document
 - past exams and notes from the marking centre
 - summary of changes

<http://www.boardofstudies.nsw.edu.au/>

All URLs in resource book, pages 4-7



http://www.boardofstudies.nsw.edu.au/syllabus_hsc/syllabus2000_listi.html

Where can I find resources?

- ▶ ...and of course, at <http://www.curriculumsupport.education.nsw.gov.au>
Click on *Years 7-12* → *Technology*

Lyndall Foster – Manager, Technology unit
9886 7623

lyndall.foster@det.nsw.edu.au

Where can I find resources?

- ▶ Teaching and Learning exchange TaLe
<http://www.tale.edu.au/tale/>
Secondary → Share → Tools
- ▶ Join Computing Studies Teachers' Association
<http://www.csta.org.au>
- ▶ Join Computer Education Group
<http://www.nswceg.org.au>

Teaching programs in IPT

What does DET expect of us?

- ▶ **1.1 Curriculum planning and programming**
 - 1.1.1 Schools plan curriculum and develop **teaching programs** which are consistent with the Education Act and Board of Studies syllabuses and credentialing requirements.
 - 1.1.2 Curriculum planning and teaching programs will meet the **Policy Standards**.
 - 1.1.3 Teaching programs will **incorporate assessment** as an integral component.
 - 1.1.4 Teaching programs will indicate the **outcomes** being addressed, the **teaching activities** planned and the intended assessment strategies.

https://www.det.nsw.edu.au/policies/curriculum/schools/curric_plan/policystandards161006.pdf

Teaching programs in IPT

- ▶ Your school may have other requirements, for example:
 - addressing aspects of the School Management Plan
 - being written or stored in a certain format.

Activity 1a - Tools - ECAT and others

This activity introduces a tool you may find useful to help you meet your school's obligations in terms of programming and assessment...

The purpose of this activity is to:

- ▶ explore the features, functions and applications of the Electronic Content Allocation Tool (ECAT)
- ▶ practise using the tool on a resource.

HSC Course		1	2	3	4	5
database information systems						
	• identify participants, data/information and information technology for the given examples of database information systems					
	• describe the relationships between participants, data/information and information technology for the given examples of database information systems					
• school databases holding information on teachers, subjects, classrooms and students						
• the Roads and Traffic Authority holding information on automobiles and holders of drivers licences						
• video stores holding information on borrowers and videos						
organisation						
• non-computer methods of organising including:	• choose between a computer based or non-computer based method to organise data, given a particular set of circumstances					
– telephone books						
– card based applications						
• computer based methods of organising, including:	• identify situations where one type of database is more appropriate than another					
– flat file systems						
– database management systems						
– hypertext						
• the advantages and disadvantages of computer based and non-computer based organisation methods	• represent an existing relational database in a schematic diagram					
• the logical organisation of flat file databases, including:						
– files						
– records						
– fields, key fields						
– characters						
• the logical organisation of relational databases, including:	• create a schematic diagram for a scenario where the data is to be organised into a relational database					
– schemes as consisting of:						
– entities						
– attributes						
– relationships						
– one to one						
– one to many						
– many to many						
– tables as the implementation of entities consisting of:						
– attributes						
– records						
– linking tables using primary and foreign keys						
– user views for different purposes	• modify an existing schema to meet a change in user requirements					

HSC Course		1	2	3	4	5
database information systems						
	• identify participants, data/information and information technology for the given examples of database information systems					
	• describe the relationships between participants, data/information and information technology for the given examples of database information systems					
• school databases holding information on teachers, subjects, classrooms and students						
• the Roads and Traffic Authority holding information on automobiles and holders of drivers licences						
• video stores holding information on borrowers and videos						
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– tables as the implementation of entities consisting of:						
– attributes						
– records						
– linking tables using primary and foreign keys						
– user views for different purposes	• modify an existing schema to meet a change in user requirements					

HSC Course: Unit 2		TEACHER	ROOM	File Control
UNIT NAME	Database, Database			
CLASS	12 IPT 2001			
TEACHER				
ROOM				
FILE CONTROL				
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1.100. Introduction to database systems				

Activity 1a

Tools: ECAT and others

- ▶ In groups of 2 or 3, analyse the Board of Studies' unit of work using ECAT.
- ▶ Instructions and screen shots are found on page 5 of the *Participant workbook* or pages 25–28 of the *Resource book*.

Find ECAT
http://www.curriculumsupport.education.nsw.gov.au/secondary/technology/11_12/information/index.htm

Tools for Review

- ▶ In your folder is *Tools for review*.
 - ▶ This contains checklists to help you check
 - assessment plans
 - formal assessments
 - course plans
- for compliance with Board and DET requirements.

Find ECAT
http://www.curriculumsupport.education.nsw.gov.au/secondary/technology/11_12/information/index.htm

Your turn



<http://www.lumaxart.com>

A mapped project

[illegible]

A mapped project

[illegible]

Activity 1b: Reciprocal teaching strategy

Aim

- ▶ to become familiar with a teaching strategy that can help students to comprehend and respond to an article that uses complex language
- ▶ to enhance students' ability to respond to social and/or ethical questions

- ▶ Use these resources to help you analyse the article *OLTP* by Ben Rockwood
 - OLTP vs OLAP diagram*
 - Glossary of terms
- (Pages 29 – 31 of the *Resource book*)

*Original source:
http://www.rainmakerworks.com/pdfdocs/OLTP_vs_OLAP.pdf
Used with their permission

The steps...

- ▶ In groups of 2 or 3:
 - Predict
 - Clarify
 - Question
 - Summarise

Produce a resource

- ▶ Construct one question you could ask students to test their response to this extract.

In your group, discuss...

- ▶ ... the use of this strategy and make suggestions about how it may be used in class.
 - For example, you could take an extended text, have each group analyse a paragraph and report back to the group...

Session 2 Projects and Ethics

Project work

The aim of this activity is to:

- ▶ assist you to integrate project work more fully into your teaching
- ▶ share ideas.

This is what the syllabus says...

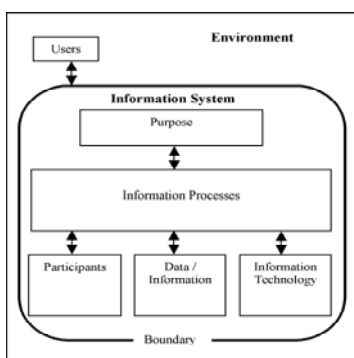
From the preamble to HSC topic 9.1 – Project Management

...“One large project or a number of smaller projects may be undertaken in the course. If smaller projects are undertaken, they need to occur over a significant amount of time and involve sustained work. Project(s) should allow students to see the information system in its full context. Students should identify the purpose for the information system, the participants, data/information and information technology that work with the information processes.”

But really, why use projects?

- ▶ Project work is a legitimate, effective learning methodology.
- ▶ School projects model the process used by industry to develop information system.

Suggested common elements... 1



Suggested common elements... 2

Characteristics of a real project:

- ▶ a need, problem or opportunity
- ▶ a purpose or goal
- ▶ follows a development process (the System Development Cycle)
- ▶ a defined start and finish
- ▶ concurrent, interrelated tasks
- ▶ a range of tools, techniques and other resources
- ▶ needs to be managed to reach a successful conclusion
- ▶ results in an Information System.

Quality project tasks: for students

- ▶ is purposeful and has a real user
- ▶ provides a context for syllabus content learning that is interesting to the student
- ▶ allows some student ownership and direction
- ▶ allows feedback from the (real, if possible) user to inform student design ideas.

Assessing projects

Not every component of a project needs to be part of a formal assessment. A project is not an assessment task but can be used to provide assessment evidence for targeted outcomes.

Feedback may be formal or informal. Assessment guidelines pages 64 and 65 of the syllabus.

Activity 2a

Planning tool: Setting a high quality project task

The purpose of this activity is to:

- ▶ analyse an existing project task or plan a new project task you can use in your teaching
- ▶ share ideas.

Use the planning tool on pages 8–10 of the *Participant workbook*.

Instructions are in the book.

Some ideas for project needs...

Design the Year 12 Jersey Class equipment booking system
Interactive Storybook
Videoconferencing using Bridgit for absent students
Trivia night Ticketing or other system for the school musical
On line yearbook Work experience management system
Sport choices on line Interactive family tree
Subject selection web site IWB resource for a primary class
Interactive timeline On line suggestions box about school matters

Activity 2b

Social and ethical issues, Big Brother?

The aim of this activity is to develop a teaching strategy that helps students to consider and articulate their viewpoints on social and ethical issues.

Read through the extract from *Big, Friendly Giant... or Big Brother?* by David Smith (resource book, page 32).

From what you know about the global penetration of Google, complete the round-robin activity. Take one minute to write a positive or negative impact on each page.

In your group, identify other uses for a round robin activity in IPT classes.

Session 3...
for your classroom

Activity 3a

- A marker's perspective*
- ▶ The aim of this activity is to:
 - practise marking in a mini-mirror of the process used to mark the HSC
 - develop an activity that you could use with students to improve their judgement of their own answers.

This question is from HSC 2007...

Question 21. A family of five people has dial-up internet access at home. They plan to upgrade to cable internet access. The family wants to send text-based email and download podcasts, radio, television and music online. The family has the following table of information about plans offered by an internet service provider.

Upload speed	Monthly data allowance	Monthly price	Plan name
128 kbps	800 MB	\$29.95	Cable Light
256 kbps	800 MB	\$34.95	Cable Light Plus
128 kbps	2 GB	\$39.95	Cable Extra
256 kbps	7 GB	\$49.95	Cable Max

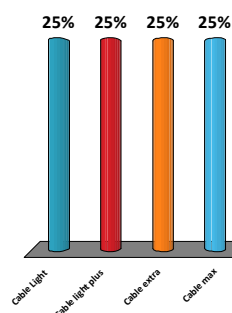
...(c) The family is considering the Cable Light Plus or Cable Extra plans. Which would be the better plan for this family? Justify your answer.

• See resource book, page 33

Which is the correct plan?...

1. Cable Light
2. Cable light plus
3. Cable extra
4. Cable max

Upload speed	Monthly data allowance	Monthly price	Plan name
128 kbps	800 MB	\$29.95	Cable Light
256 kbps	800 MB	\$34.95	Cable Light Plus
128 kbps	2 GB	\$39.95	Cable Extra
256 kbps	7 GB	\$49.95	Cable Max



From the marking centre...

- ▶ c) Better responses recognised that upload speed was not a significant requirement for the family in the scenario but monthly download allowance was a more important feature. These responses clearly explained the large file sizes associated with downloading podcasts, radio, television and music online.
- ▶ Mid-range responses were able to identify *Cable Extra* as the most appropriate plan but their justification needed greater depth with regard to the files sizes involved in the downloading process.
- ▶ Weaker responses often mixed the concepts of uploading and downloading and chose the *Cable Light Plus* plan

• See Resource book, page 35

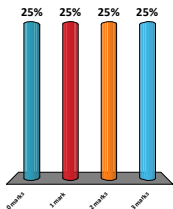
Marking guidelines...

Response recommends one of the two plans the family is considering and provides a credible justification. Better responses will provide a thorough justification or provide more than one appropriate reason with justification for their recommendation	2-3
Response provides a weak justification for either plan or states the cable extra plan	1

• See Resource book, page 34

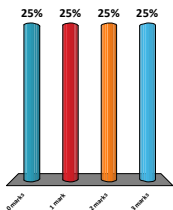
Script A

- A. 0 marks
- B. 1 mark
- C. 2 marks
- D. 3 marks



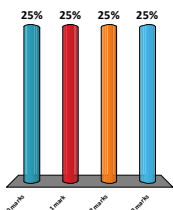
Script B

- A. 0 marks
- B. 1 mark
- C. 2 marks
- D. 3 marks



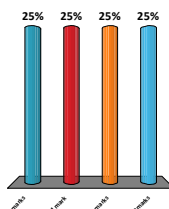
Script C

- A. 0 marks
- B. 1 mark
- C. 2 marks
- D. 3 marks



Script D

- A. 0 marks
- B. 1 mark
- C. 2 marks
- D. 3marks



Activity 3b

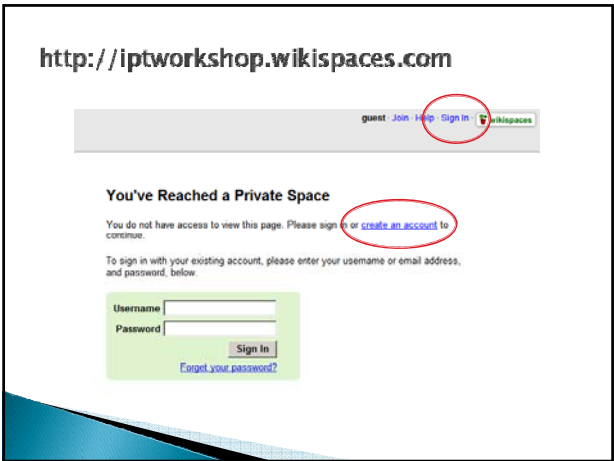
Online tools

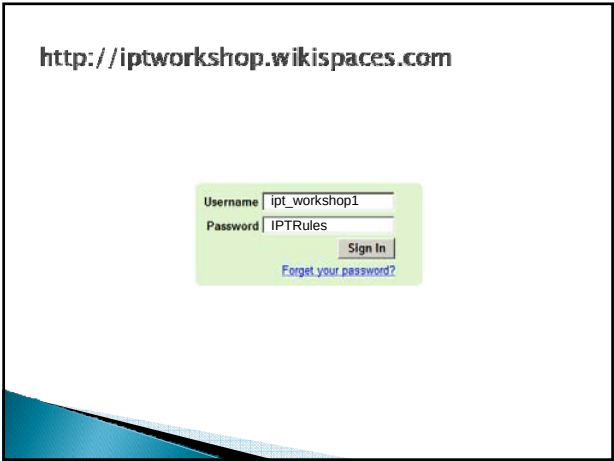
- ▶ The aim of this session is to:
 - demonstrate how a two-way-web technology could be used in class
 - build collaboratively a resource we can all use.

Web 2.0

What does this term actually mean? There is an implication that this is a new version...

- ▶ The web as a platform?
- ▶ The two-way web?
- ▶ The active web?
- ▶ The democratic web?
- ▶ Web-based applications? (e.g. buzzword)







Activity

In your group

- Identify one content area that would be suitable for a wiki or blog topic
- Choose two elements from the table
- Identify how you might use the wiki or blog tool to support that element
- Identify other social softwares you might use to support your students' learning

	<i>Intellectual quality</i>	<i>Quality learning environment</i>	<i>Significance</i>
Elements	Deep knowledge	Explicit quality criteria	Background knowledge
	Deep understanding	Engagement	Cultural knowledge
	Problematic knowledge	High expectations	Knowledge integration
	Higher-order thinking	Social support	Inclusivity
	Metalinguage	Students' self-regulation	Connectedness
	Substantive communication	Student direction	Narrative

FAQs

FAQs

Filtering

- ▶ The good, the necessary, the procedures...
 - Is the filtering based on a black list or a white list?
 - Is the filtering purchased from an outside body?
 - Is the team's workload increasing?
 - Is there a set of specific guidelines the team uses and if so, could it be made public?

FAQs

▶ Proposed changes to the HSC*

◦ Reading and planning time

◦ Assessment tasks

* Top link on the Board's web site as we speak.

Responses by Friday 17 October 2008
