

# Technology Enhanced Knowledge Research Institute (TEKRI)

# How education works

MADLaT, April 2014

Jon Dron

TEKRI

Athabasca University



# Is there a learning technology in this picture?

The image shows a screenshot of a university website's announcements page. At the top, there is a navigation bar with the Curtin University logo and the text "Curtin University". Below this, a secondary navigation bar contains links for "Home", "Students", "OUA", "Staff", "Library", "OLAS", and "Community". A third navigation bar features a home icon and the word "Announcements".

On the left side, there is a sidebar menu for "Operations and Materials Management 301 (2013.1 OMM 301)". The menu items include: "Announcements", "Unit Overview", "Contacts", "Unit Materials", "Assignments", "Communication", "Web Links", "Tools", "Discussion Board", and "iLectures".

The main content area is titled "Announcements" and contains the following text:

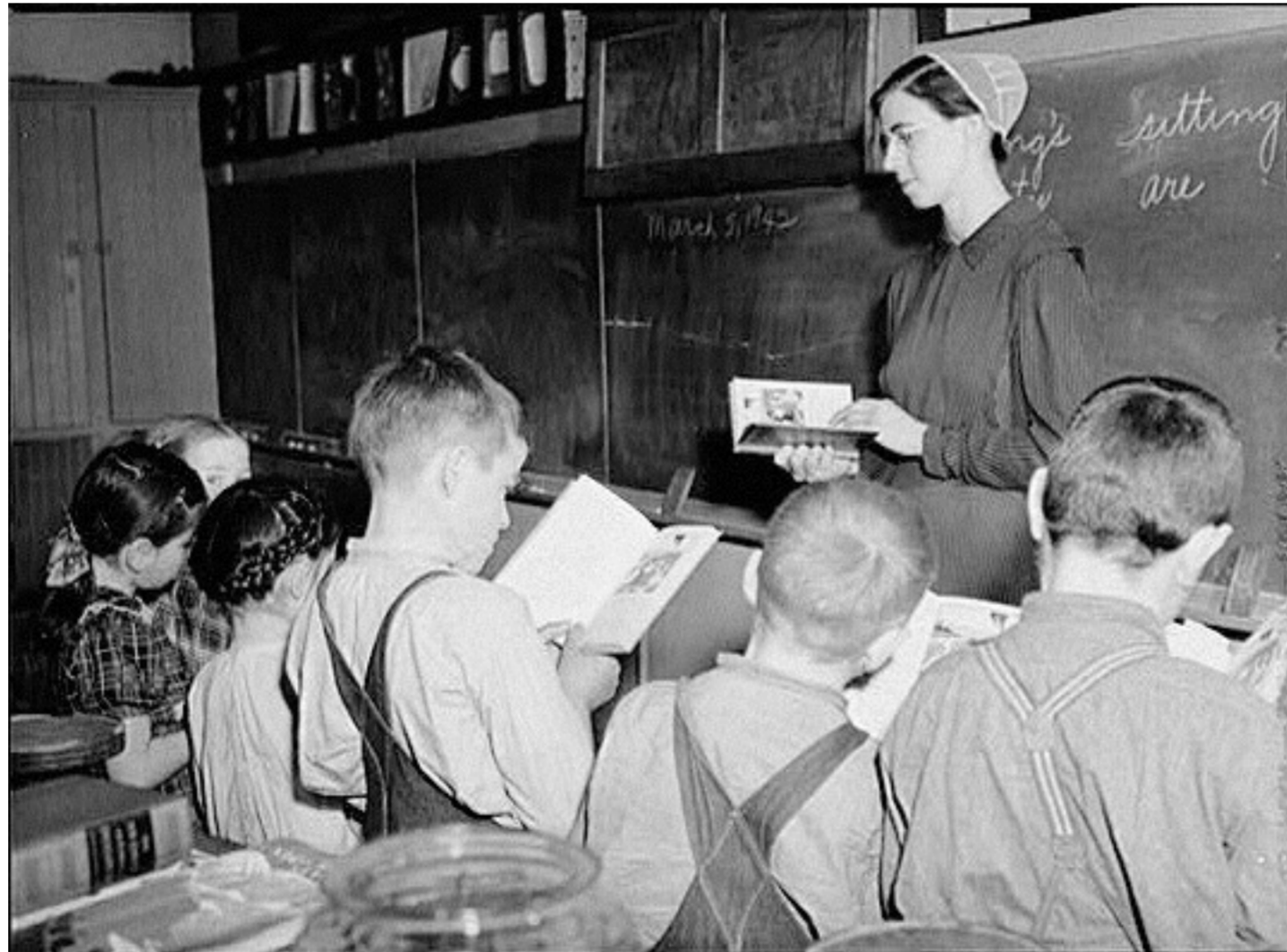
*New Announcements appear directly below the repositionable bar. Reorder by dragging Announcements to new bar to pin them to the top of the list and prevent new Announcements from superseding them. The order shown and cannot reorder Announcements.*

Below this text is a "Create Announcement" button, which is currently disabled and has a diagonal hatched pattern. Underneath the button is a dashed line with the text: *New announcements appear below this line*.

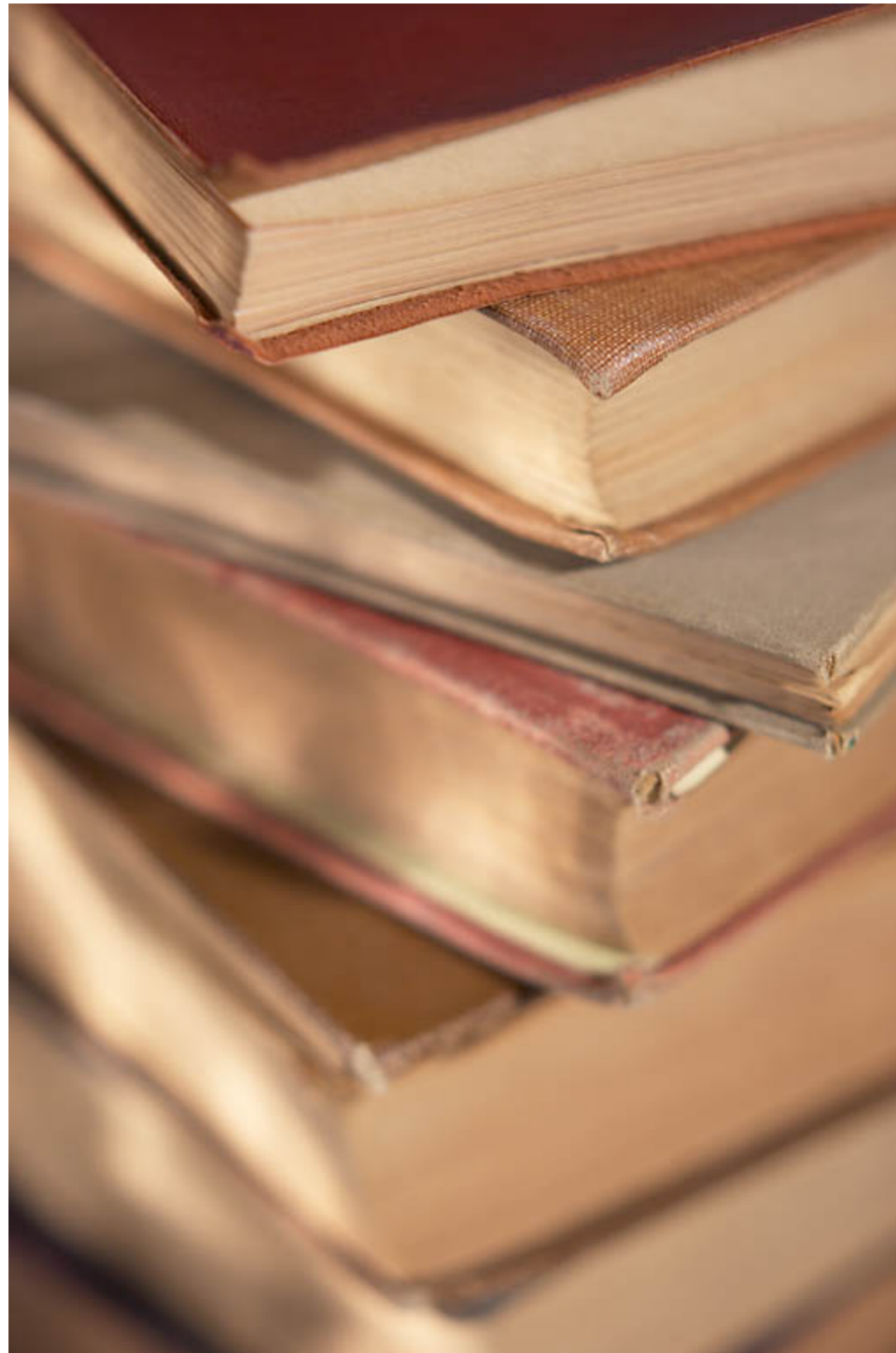
The first announcement is titled "Lecture 4" and was posted on Wednesday, 10 April 2013. The text of the announcement reads: "The missing lecture is half recorded. Not good enough, but ... I got most groups and so far all good. If you did not send me your group yet, please do so. Same for Assignment 2. On Friday, I will discuss the Assignment 1 and 2. I will give you A3. I might publish the Video tomorrow, but not expecting that you will have watched it before Friday."

Below the "Lecture 4" announcement, the start of another announcement titled "Assignment 2: Remark" is visible.

Is there a learning technology in this picture?



Is there a learning technology in  
this picture?



Is there a learning technology in  
this picture?



Is there a learning technology in  
this picture?



is this a learning  
technology?

# What is a technology?

tech·nol·o·gy/tek'näləjē/

Noun.

1. The application of scientific knowledge for practical purposes, esp. in industry: "computer technology"; "recycling technologies".
2. Machinery and equipment developed from such scientific knowledge.

Synonyms:

technics - engineering - technique

“Anything invented after you were born” (Kay)

“Everything that doesn't work yet” (Hillis)

“Ways that people get complicated things done” (Bessant & Francis)

“A combination of artefacts and what you do with them” (Nye)

“Tools with a context” (Papert)

“Not a thing but a verb” (Kelly)

“The way things are done around here” (Franklin)



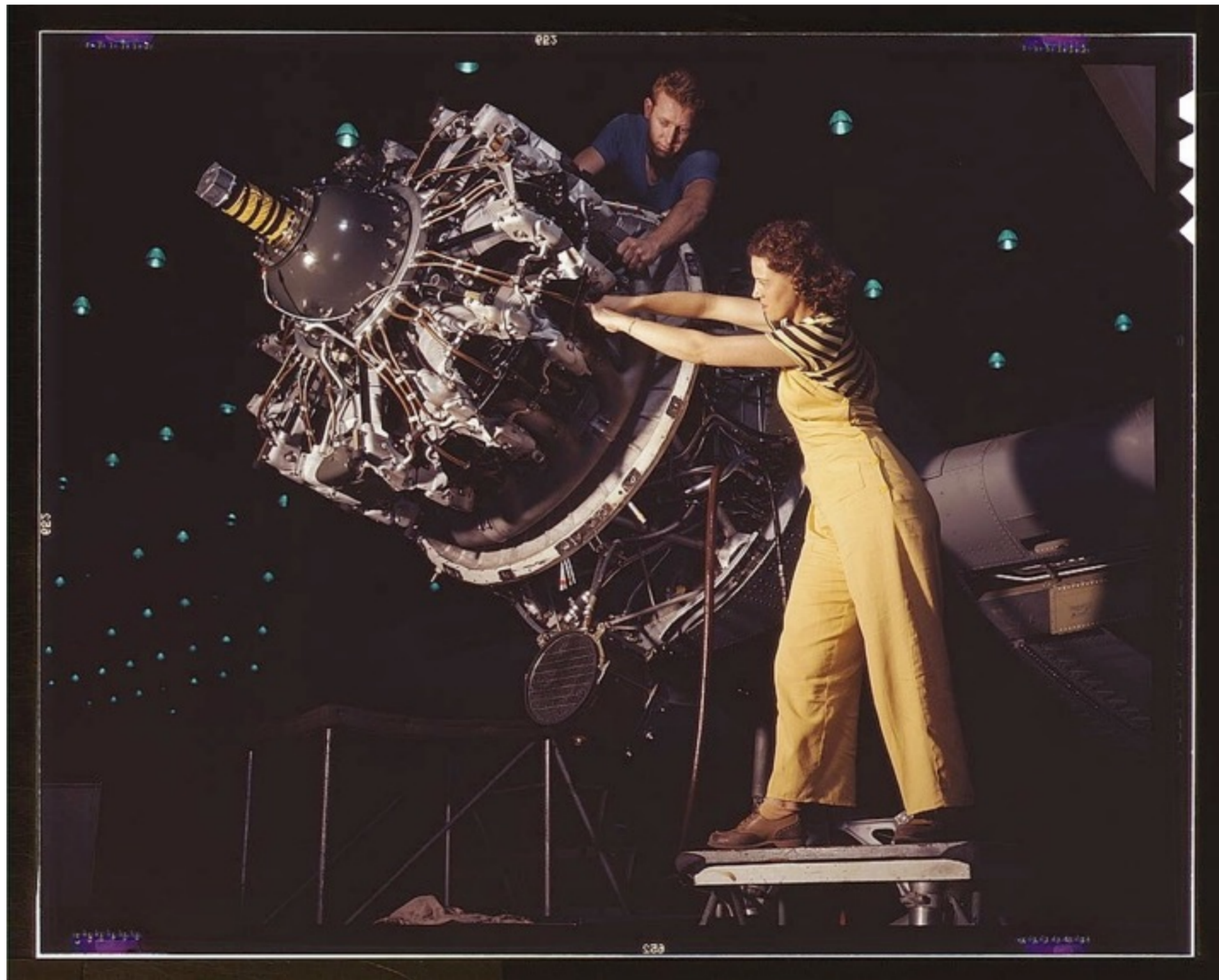


# technology

“the orchestration of phenomena for some use”

(W. Brian Arthur)

technologies are  
assemblies

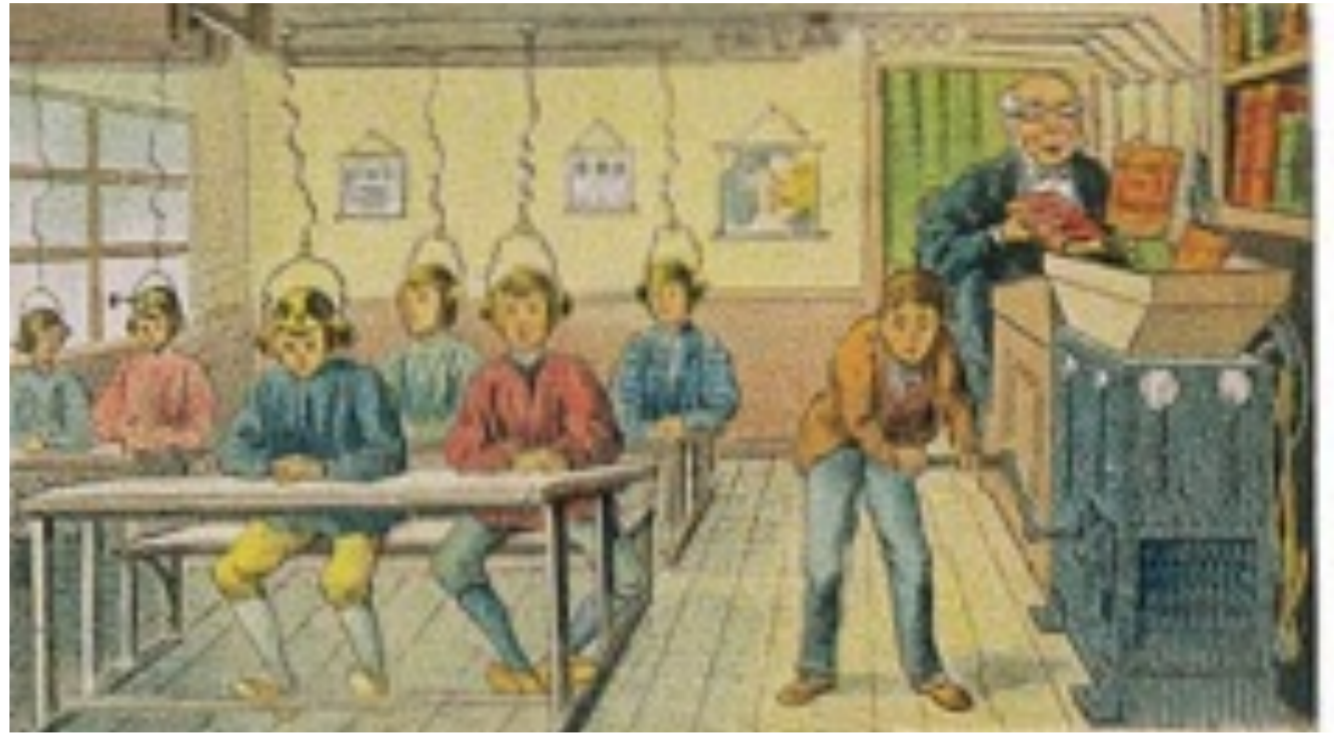




pedagogies are  
technologies



learning  
technologies



where pedagogy is  
part of the  
orchestrated  
assembly



# Hard technologies

Orchestration  
of  
phenomena  
embedded in  
the  
technology



May need skill to use them *correctly*

# Soft technologies



[http://commons.wikimedia.org/wiki/File:François\\_Barraud\\_-\\_Palette\\_et\\_Pinceaux.jpg](http://commons.wikimedia.org/wiki/File:François_Barraud_-_Palette_et_Pinceaux.jpg)

Active  
orchestration  
of  
phenomena  
by people

Skill needed to use them *well*

# points of view



Image by Jules Feiffer, from *The Phantom Tollbooth*, by Norton Juster



resilience

flexibility

diversity

creativity

control

hard is easy  
soft is hard

precision

replicability

accuracy

speed

ease of use

# cyborg technologies

we are a *part* of all soft  
technologies



and some  
technologies  
are made *of*  
us



**we shape our dwellings and  
afterwards our dwellings  
shape our lives**

# structure and behaviour



studentcentral

Home Personal - Staff Community Online Library

### My Study Areas

Courses you are teaching:

- my programme: EdSc Computing
- my course: EdSc in eSystems Design & Technology
- EdSc in eSystems Design & Technology - Staff
- CEM Staff Area
- CEM Computing Noticeboard
- CE302 - Adaptive Interactive Systems
- CE314 - Conduct of IT Projects
- EDSc in eSystems Design and Technology - Sites - Crawley
- EDSc in eSystems Design and Technology - Sites - Hastings (unavailable)
- EDSc in eSystems Design and Technology - workshop follow-up
- EDSc Internet Systems Development
- IDM07 - Theories of Learning for Educational software (unavailable)
- IDM09 - E-learning developments (unavailable)
- ISM103 - Technology (unavailable)
- ISM300 - The Internet and the World Wide Web
- Jon Dron's play course
- NOT IN USE COM01 - Reflective use of communication technologies (unavailable)

### My Announcements

No Institution Announcements have been posted in the last 7 days.

**my school: Computing, Engineering and Mathematics**

- SCHOOL OFFICE CLOSURE - WED 16TH NOVEMBER
- my course: MScIS - Masters in Information Systems
- School Office Closure - Wednesday 16 November 2011

**CEM: Computing Noticeboard**

- School Office closed Wednesday 16 November

**EM Merger**

- EM Merger Meeting notes, Profs and senior staff
- Notes from Open Meeting held on 26 October
- EM Merger Open Meeting 2

**Student Life**

- Study Skills workshops - this week improve your research
- Can't make it to the Careers Fair today?
- Who do you want running your Union this year?
- Only 2 days until Careers Fair! Will we see you there?

[more announcements...](#)

### Student Calendar

Tuesday, 8 November

Tuesday, 8 November	
10:00	By-election Voting Period
10:00	Referendum Voting Period
12:00	Knitting & Natterin - BRIGHTON
13:00	Essays / Assignments - Reading and research - EAE
13:00	Essays / Assignments - Reading and research - GRU
14:00	"In Retirement" - Knitting and natterin news - CRAWLEY

Brighton SU By-Election & Referendum

## VOTE NOW!

10am 8th Nov - 4pm 10th Nov

**Student Life**

- ASK Academic Study Kit
- Students' Union
- Student Handbook
- Sport Brighton

**UniMail** Student email

**staffmail**

**My Library Account**

**seminars**

**notify.me**

**UniCard**

**THE NEVER-ENDING UNICARD QUEST**

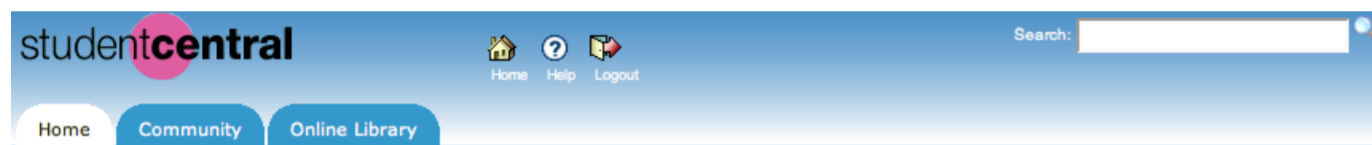
Click here to upload your UniCard photo

**Relaxation** speak to a Wellbeing Buddy

**Staff search**

pedagogies are  
*soft* technologies

# hard learning technologies



Welcome, Jon

- Tools**
- [Calendar](#)
- [User Directory](#)
- [Student email](#)
- [Staff email](#)
- [Tasks](#)
- [Address Book](#)
- [Personal settings](#)
- [MS Office Viewers](#)

- Life Support**
- [Careers & Part-time Jobs](#)
- [Childcare](#)
- [Computing, Libraries & Media](#)
- [Counselling](#)
- [Disability & Dyslexia](#)
- [Health & Wellbeing](#)
- [International](#)
- [Living here](#)
- [Money](#)
- [Partner Colleges](#)
- [Religious Life](#)
- [Restaurants, Cafes & Shops](#)
- [Rights & Responsibilities](#)
- [Safety & Security](#)
- [Sport Brighton](#)
- [Student Handbook](#)

Alhambra University Home | Courses | Programs | Register Now | myAU

COMP 602\_F07 Computer Science 602: Enterprise Information Management

School of Computing and Information Systems

You are logged in as Jon Dron (Logout)

SCIS ► COMP 602\_F07

People  
Participants

## Weekly outline

Course Menu

- COMP 602\_F07
- Control Panel
- Turn editing on
- Gradebook
- Weeks 1
- Weeks 2
- Weeks 3
- Weeks 4
- Weeks 5
- Weeks 6
- Weeks 7
- Weeks 8

- Welcome to COI
- COMP 602 Sylla
- News forum
- COMP 602 Orac
- COMP 602 Gene
- Course wiki
- TME 1 (1 new st)
- TME 1 Forum
- TME 2 (0 new st)
- TME 2 Forum
- TME 3 (0 new st)
- TME 3 Forum

INTRODUCTION TO Artificial Intelligence

In partnership with STANFORD ENGINEERING

Course Discussion Progress Information Profile

## The instructors



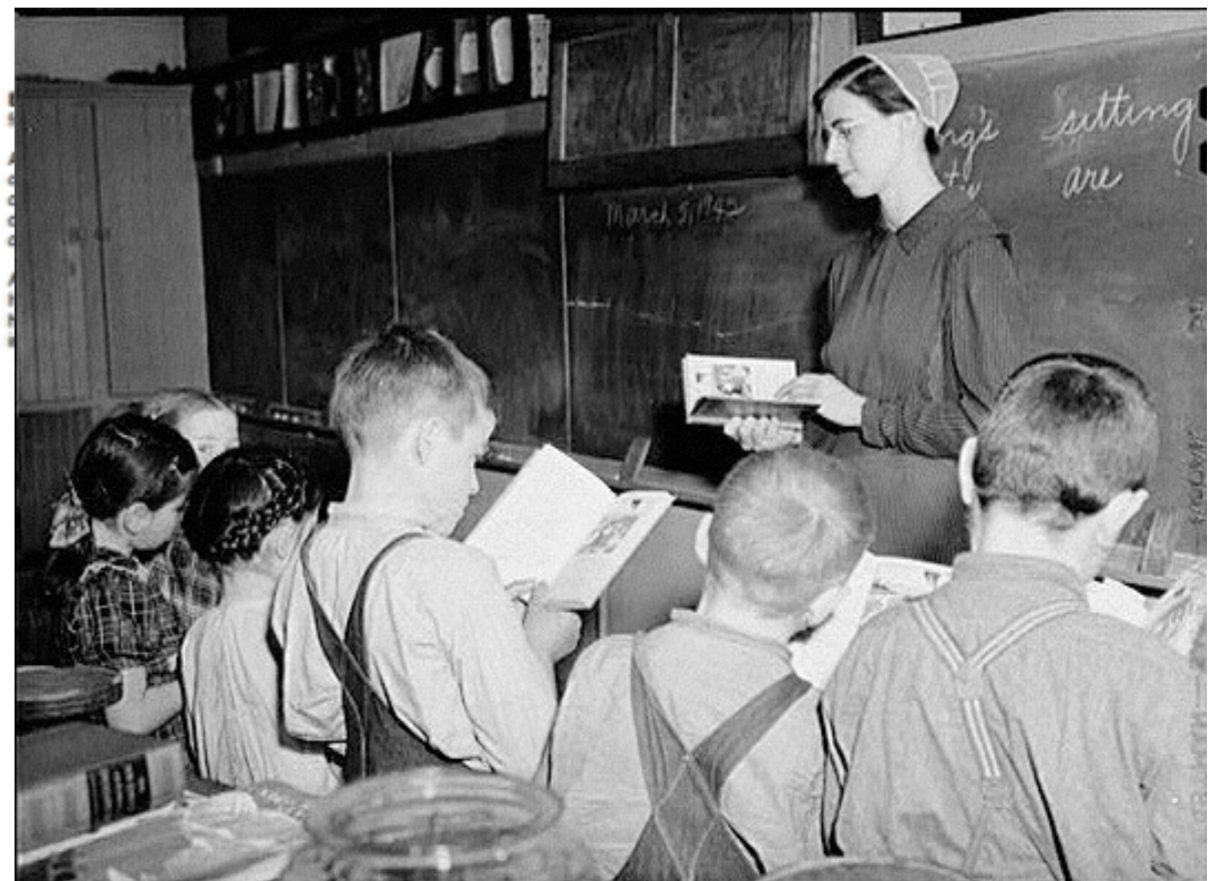
**Sebastian Thrun**  
Sebastian Thrun is a Research Professor of Computer Science at Stanford

University, a Google Fellow, a member of the National Academy of Engineering and the German Academy of Sciences. Thrun is best known for his research in robotics and machine learning.



**Peter Norvig**  
Peter Norvig is Director of Research at Google Inc. He is also a Fellow of the American

Association for Artificial Intelligence and the Association for Computing Machinery. Norvig is co-author of the popular textbook Artificial Intelligence: A Modern Approach. Prior to joining Google he was the head of the Computation Sciences Division at



# soft learning technologies



A screenshot of the Athabasca University Landing page. The page features a navigation bar with links for 'My Dashboard', 'My Profile', 'Tools', and 'My Account'. The main content area includes a 'Welcome to the Landing' section, a 'Things we have been posting lately' section with recent blog posts, and a 'Latest wire posts' section with user-generated content. The page is titled 'ATHABASCA UNIVERSITY LANDING'.

Soft is hard

but very flexible



help, social  
computing, education,  
facebook, learning, widget,  
50, law, social media, group,  
privacy, moodle, social  
re.comp 607, elgg,  
ng, comments, dashboard,  
comp650, social  
technology, ethics,  
plugin.

# conversations

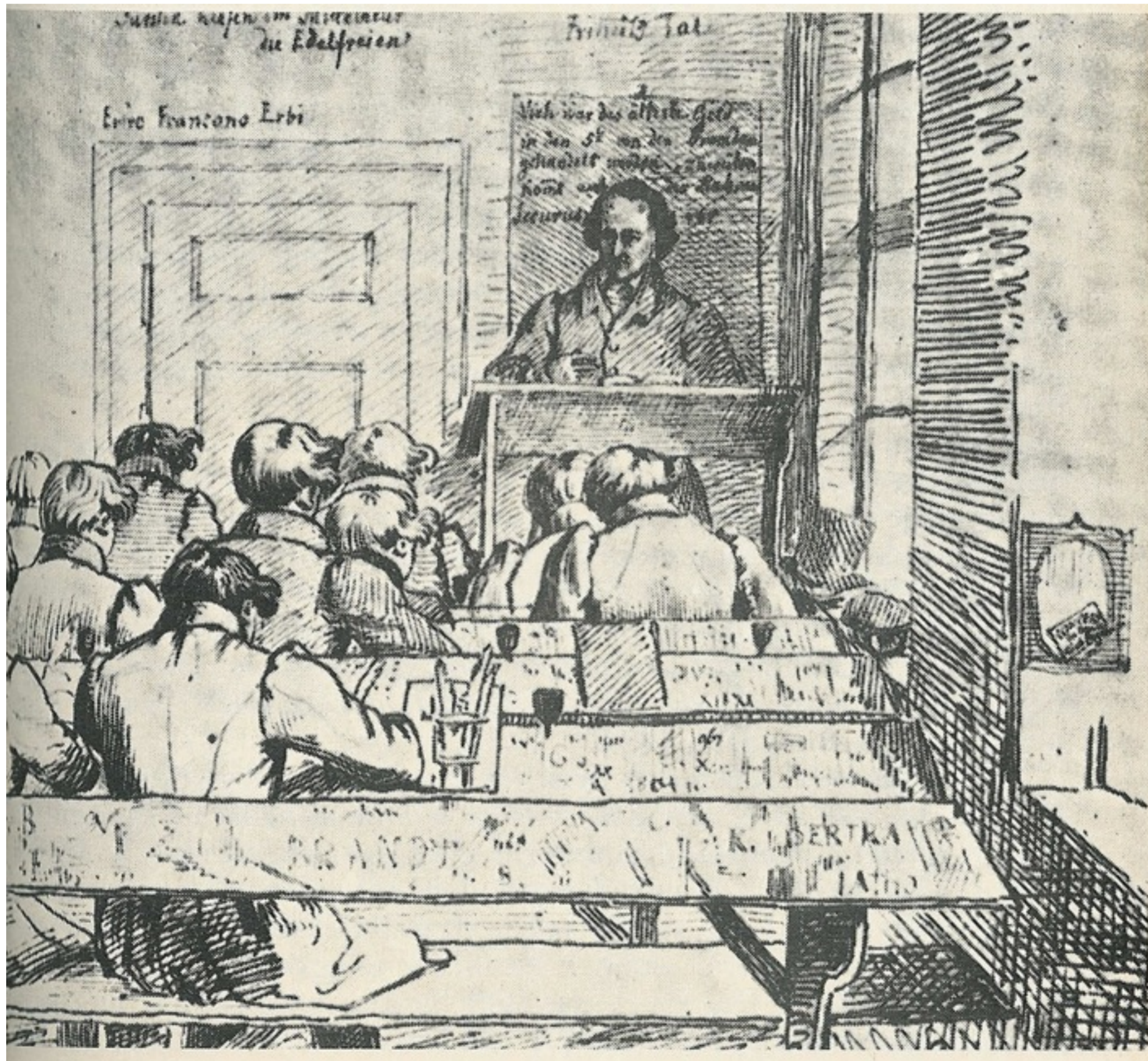




# a dance



# distributed



**contrasting soft and  
hard technologies**

# diverse



R1

Welcome to Computer Science 214, an exploration of the current and emerging with some historical perspective. To be the links below, which tell you what your course. If you need more information a

- Overview and Introduction
- Outline
- Software
- Evaluation
- Tips on Writing Essays
- Academic Integrity

**Course Communication**

- News and Announcements
- General Course Discussion
- Software Peer Support Forum
- Course Mail

**Planning Assignment**

- Do this first.
- Personal Assignment Plan
- Assignment Planning Calculator

You can complete Assignments

**Topic 1 – The Context of Human-Co**

- Topic 1 Activities
- Assignment 1

**Topic 2 – Input and Output**

- Topic 2 Activities
- Assignment 2

**Topic 3 – Using and Evaluating App**

56 R1

**Topic outline**

- Welcome to COMP 266
- Using Moodle
- COMP 266 Syllabus
- Digital Reading Room
- The SCIS Virtual Helpdesk
- COMP 266 General Conference
- News forum
- COMP 266 Study Guide
- Tutor Marked Exercise (TME) 1
- Tutor Marked Exercise (TME) 2
- Tutor Marked Exercise (TME) 3
- Tutor Marked Exercise (TME) 4
- test

**1 Week 1**

- Complete Unit 1
- Start to work on part one of your

**2 Week 2**

- Complete Unit 2

**3 Week 3**

- Begin Unit 3

**4 Week 4**

- Complete Unit 3

**5 Week 5**

- Complete Unit 4
- Complete and Submit TME 1

**6 Week 6**

- Complete Unit 5

2 508

**Weekly outline**

- Welcome to COMP 602
- Using Moodle
- COMP 602 Syllabus
- Getting Help
- Copyright Information
- News forum
- COMP 602 Grade Instalatior
- COMP 602 General Discussi
- Course wiki
- Frequently asked questions
- Tutor Marked Exercise (TME) 1 Forum
- Tutor Marked Exercise (TME) 2 Forum
- Tutor Marked Exercise (TME) 3 Forum
- Project
- Project Forum
- Archived Study Guide in down
- Archived Study Guide in PDF

1 May - 7 May  
Week 1: Introductions  
E-mail your tutor to introduce you  
Familiarize yourself with the S  
COMP 602 Student Bios a

8 May - 14 May  
Week 2: information manage  
Complete Unit 1 of the Study

15 May - 21 May  
Week 3: the entity-relationship r  
Complete Unit 2 of the Study

22 May - 28 May  
Week 4: the relational model  
Complete Unit 3 of the Study  
Submit TME 1

29 May - 4 June  
Week 5: database implementati  
Complete Unit 4 of the Study

# uniform

# difficult



# easy



brittle

flexible



**complicated**



**complex**



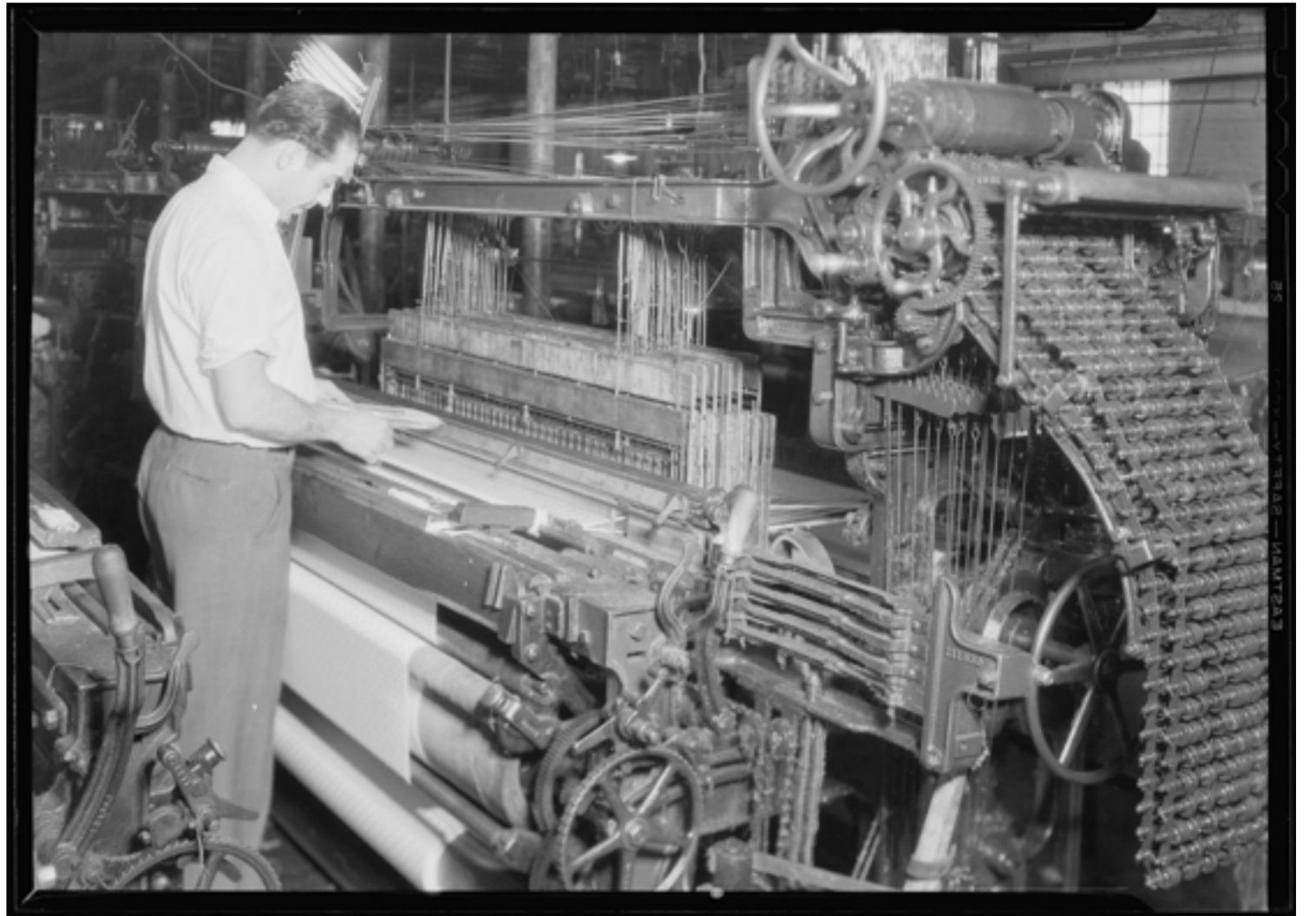
# aggregation



# replacement



# replication



# novelty

# precision



# interpretation

# efficiency



# control

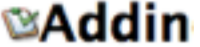
# softening

- modification
- aggregation
- extension
- communication




# hardening

- replacement
- automation
- limiting
- filtering









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Name\*



Introduction 



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Open the quiz  21  October 



Close the quiz  21  October 



Time limit (minutes) 



Time between first and second attempt  None 

Time between later attempts  None 



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Questions per page  Unlimited 



Shuffle questions  No 

Shuffle options within questions  Yes 



---

Attempts allowed  Unlimited 

Questions build on the last  No 

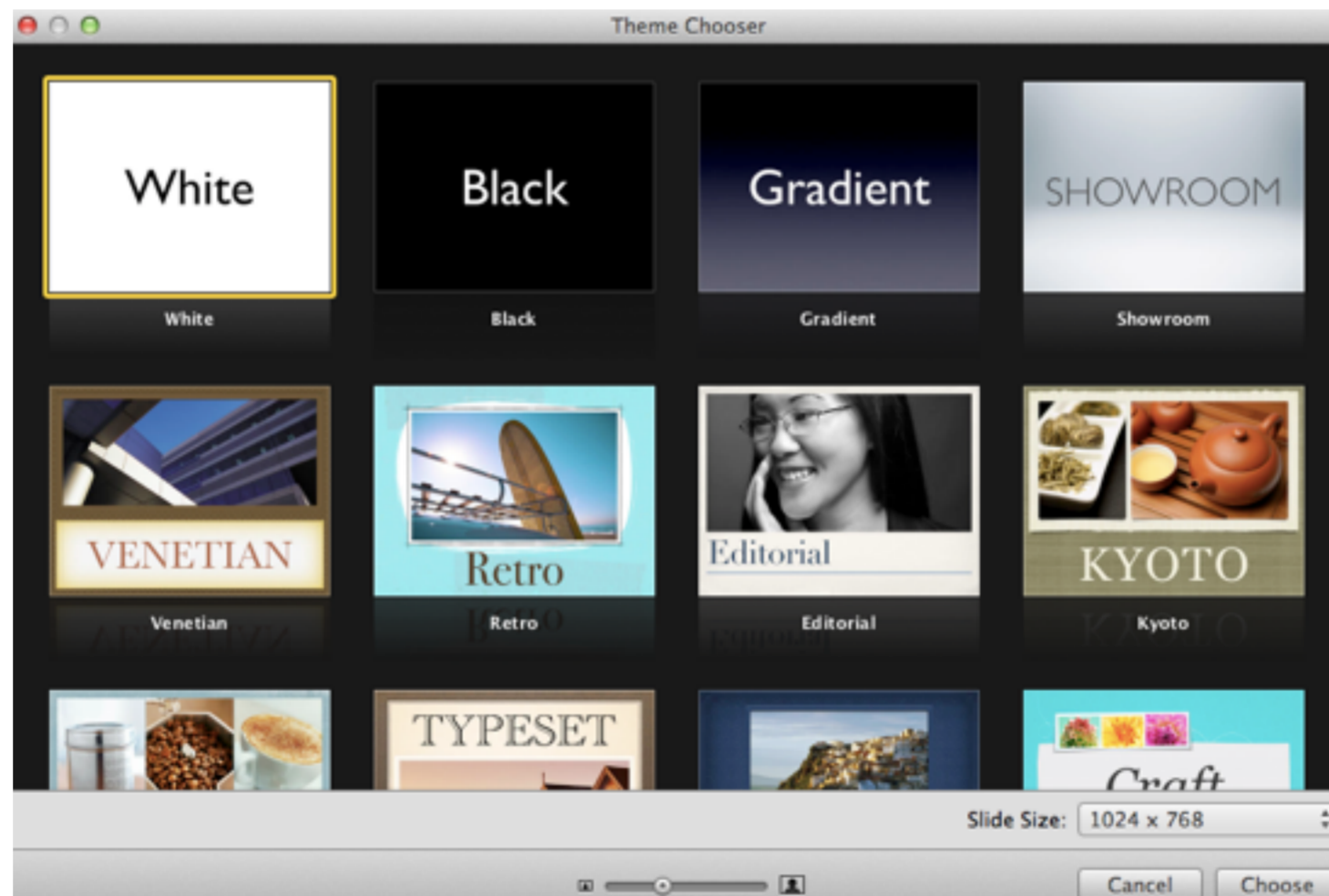
Adaptive mode  Yes 

---

Send email alerts  No 

# defaults harden

they make things easy



but can make us stupid

# assemblies soften

they can make broken hard things work



but sometimes it is better to fix the hard thing

# three bears



Steel, Flora Annie. *English Fairy Tales*. Arthur Rackham, illustrator. New York: Macmillan Company, 1918.





<http://www.flickr.com/photos/photonquantique/2596581870/sizes//in/photostream/>

# No significant difference



**nsd** NO SIGNIFICANT DIFFERENCE

<http://www.nosignificantdifference.org/>



It ain't what you  
do...



# thank you

Landing: [\*https://landing.athabascau.ca/profile/jond\*](https://landing.athabascau.ca/profile/jond)

Home page: [\*http://jondron.athabascau.ca\*](http://jondron.athabascau.ca)

Aggregation page: [\*http://jondron.org\*](http://jondron.org)

email: [\*jond@athabascau.ca\*](mailto:jond@athabascau.ca)

Twitter: [\*@jondron\*](https://twitter.com/jondron)