

# REFLECTIONS AND THOUGHTS ON THE PEDAGOGICAL USE OF DIGITAL LEARNING ENVIRONMENTS FOR IMPROVED STUDENTS' ENGAGEMENTS IN ENGINEERING EDUCATION

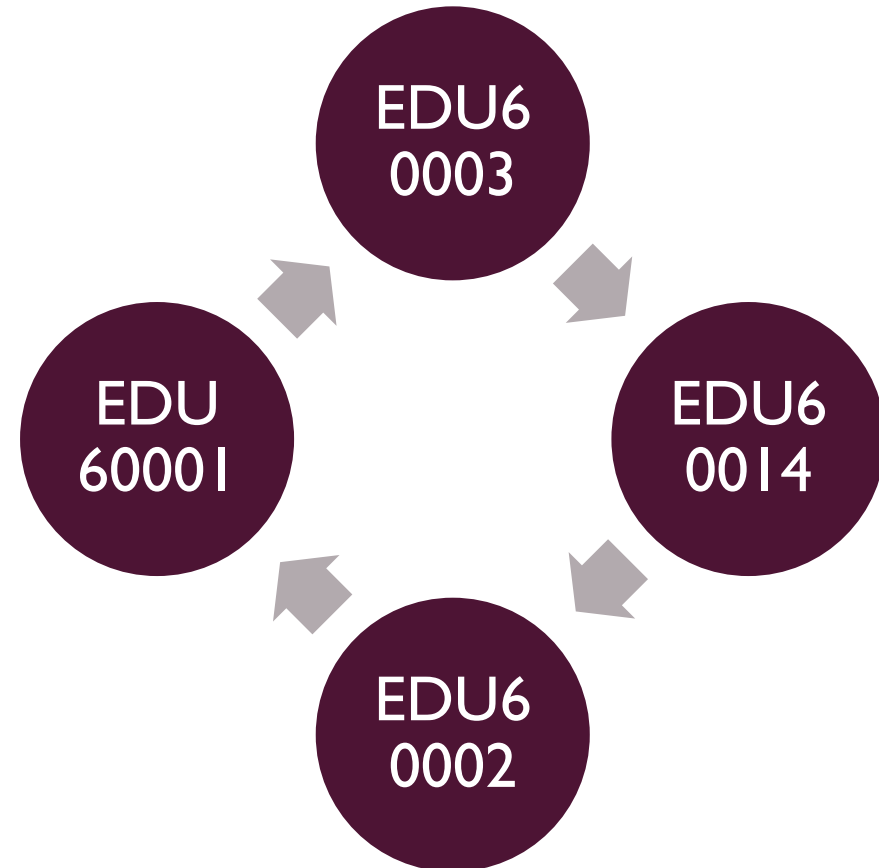
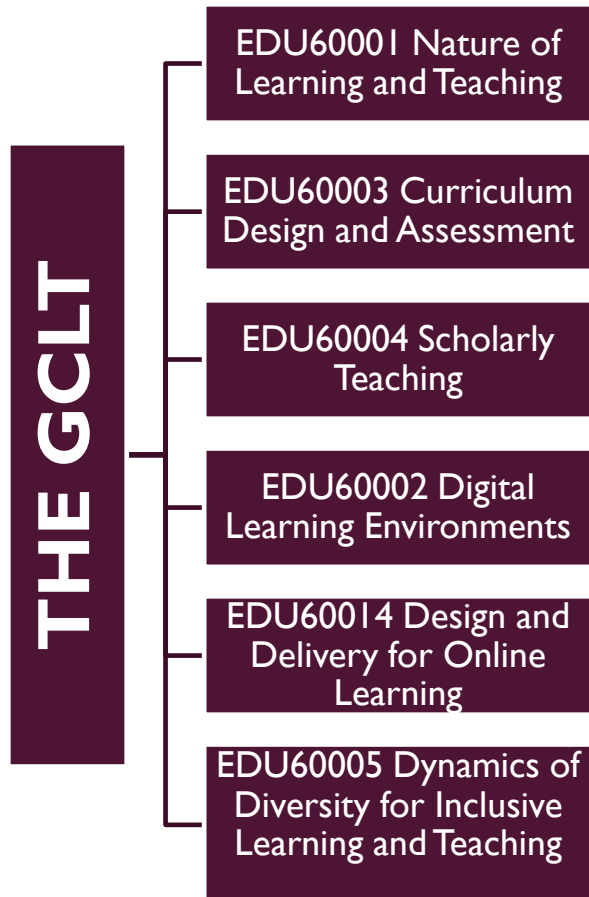
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AFFILIATION: THE UNIVERSITY OF NOTTINGHAM MALAYSIA CAMPUS

**2016 IEEE International Conference on Teaching and Learning in Education  
(IEEE ICTLE'16)**

# AGENDA

- INTRODUCTION
- THE GCLT PROGRAM
- THE DLE MODULE
- PEDAGOGICAL CONSIDERATION WITHIN THE DLE
- REFLECTIONS AND THOUGHTS

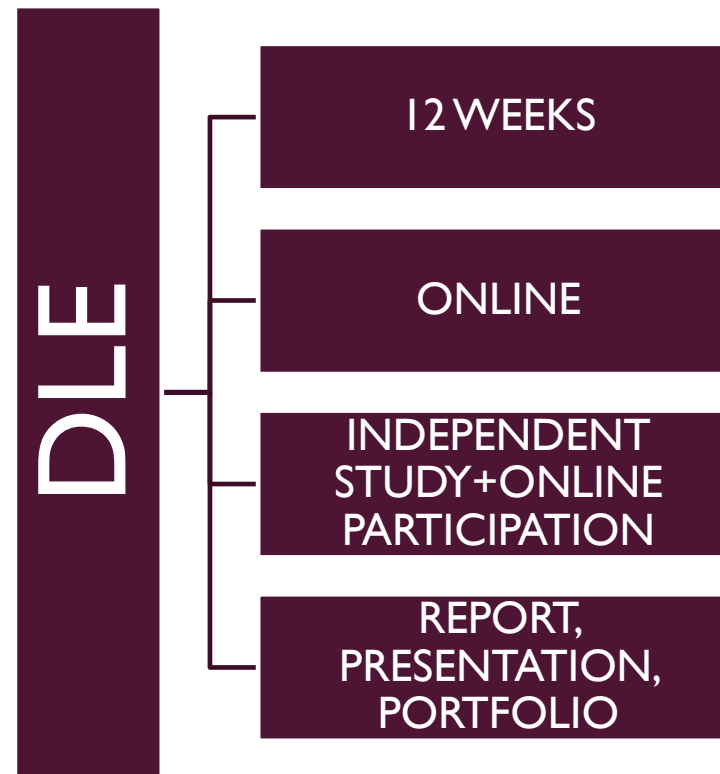
# THE GCLT: A STAFF PROFESSIONAL DEVELOPMENT PROGRAM





# THE DIGITAL LEARNING ENVIRONMENTS MODULE

# THE ANATOMY OF THE DLE MODULE



## THE DLE MODULE EQUIPS PARTICIPANT

### THE digital learning technologies (DLE) module:

- Utilization of technology for learning and teaching aims and outcomes
- Practical and hands on and allows interaction with digital learning technologies
- Exposes to a diverse range of technologies
- Encourages a highly collaborative learning environment

# LEARNING OUTCOMES

Critically review directions of digital technologies in current and future learning environments.

Analyse and evaluate learning technologies for the achievement of appropriate pedagogical outcomes.

Design, develop, implement and evaluate learning experiences that utilise appropriate and relevant digital technologies.

Evidence individual and collaborative learning through a learning and teaching portfolio.

# MODULE BLACKBOARD PAGE

The screenshot shows a Blackboard LMS interface. At the top, the SWINBURNE logo is on the left, and the user's name 'Khameel Bayo Mustapha' is on the right. Below the logo, the course title '2015-HS2-EDU60002-Digital Learning Environments' is displayed. The left sidebar contains a navigation menu with icons and labels for 'Start Here!', 'Announcements', 'Unit Outline', 'Staff', 'Assessments', 'Learning Material', 'Week 1', 'Week 2', 'Week 3', 'Week 4', 'Weeks 5 - 8', 'Weeks 9 - 12', 'Journal', 'Blackboard Collaborate', and 'Discussion Board'. The main content area is titled 'Getting Started' and includes a welcome message: 'Welcome to Digital Learning Environments! Hello and Welcome to EDU60002 Digital Learning Environments.' Below this is a video player showing a video titled 'Introduction to Digital Learning Environments' by 'Kulari Lokuge Dona'. The video player has a play button and a share icon. Below the video, there is a 'Transcript' link and a paragraph of text: 'This unit provides an overview of Digital Learning Environments, as well as introduces different learning technologies that can be used to enhance students learning experience. This unit will also assist you to explore some digital tools available to you and to develop the skills needed to select and implement appropriate technologies to support your teaching aims. Take the opportunities provided in the unit to "practice and play," with different learning technologies and to test whether the integration of technology assists you achieving your learner objectives. The learning material has been structured into weekly content folders upto week 4 to help you progress through the unit in a timely manner. From week 5 onwards the content is divided into two "Collections" as weeks 5-8 and 9-12. Although all topics in the collections need to be completed by the final week, they allow you to work through the topics in any order and learn at your own pace. I hope you enjoy the unit. Kulari - Unit Convenor.'



# LEARNING CONTENT STRUCTURE



The first section in a week is called 'Let's Get Started' and applies to events:

1. Gain attention
2. Inform learners of objectives
3. Stimulate recall of prior learning



The middle section in a week is called 'Time To Do Some Activities' and applies to events:

1. Present the content
2. Provide "learning guidance"
3. Elicit performance (practice)
4. Provide feedback



The last section in a week is called 'Before We Move On' and applies to events:

1. Assess performance
2. Enhance retention and transfer to the job

# WHAT IS COVERED IN WEEK 1 – WEEK 4?

## Introduction and Connection

- Week 1

## Overview of State-of-the-art

- Week 2

## Enhance Learning with Digital Learning Technologies

- Week 3

## Technology-enhanced Learning with Social Media

- Week 4

- I. Halavais, A. 2013. Teaching and learning with social media. *The Social Media Handbook*, 93.
- II. Jochems, W., Koper, R. and Van Merriënboer, J. 2004. *Integrated e-learning: Implications for pedagogy, technology and organization*, Routledge.
- III. Kettunen, J., Kairisto-Mertanen, L. and Penttilä, T. 2013. Innovation pedagogy and desired learning outcomes in higher education. *On the horizon*, 21, 333-342.
- IV. Thomas, D. and Brown, J. S. 2011. *A new culture of learning: Cultivating the imagination for a world of constant change*, CreateSpace Lexington, KY.

## WHAT IS COVERED IN WEEK 5 – WEEK 8?

### ASSESSMENT IN THE DLE

- Week 5

### FEEDBACK IN THE DLE

- Week 6

### PRESENTING IN THE DLE

- Week 7

### GROUP WORK IN THE DLE

- Week 8

## WHAT IS COVERED IN WEEK 9 – WEEK 12?

### GAMES IN THE DLE

- Week 9

### OER

- Week 10

### ACCESSIBILITY IN THE DLE

- Week 11

### FUTURE OF THE DLE

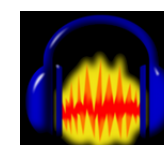
- Week 12

# WEEK 1 – WEEK 4: RELATIONSHIP BETWEEN TEACHING AND TECHNOLOGY

- Become familiar with a social, collaborative, constructivist pedagogy appropriate to a digital learning environment.
- Provided a walk through the difference between cooperative learning, collaborative learning, computer-aided collaborative learning, networked learning and of course the classical individual learning
- Does the technology we have change the fundamental aspects of teaching? Do our teaching theories change the way we use technology? Is it teaching first and then technology, or technology first and then teaching?

## WEEK 5 – WEEK 8: MANY TOOLS EXIST

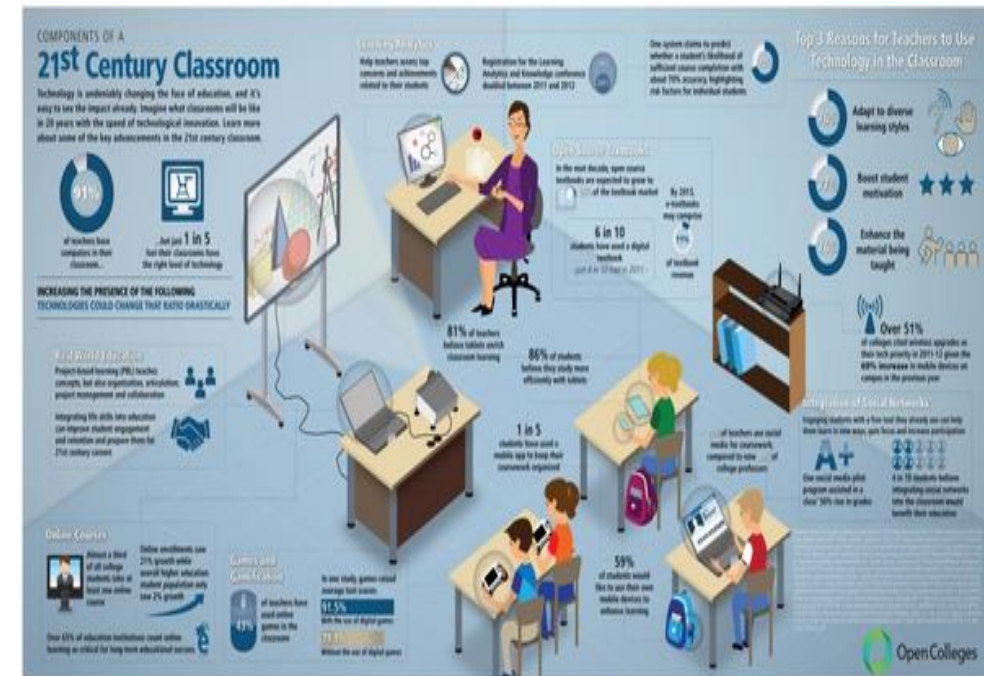
Pedagogical objectives	Tools
<b>Assessment in the DLE</b>	Blackboard (BB) Tests, quizzes, surveys, Turnitin, SafeAssign, portfolios, peer and self-assessment tasks and marked discussion boards
<b>Feedback in the DLE</b>	VoiceThread, Audacity, Camtasia
<b>Group Work in the DLE</b>	Wikis, Discussion board, Google Hangout, Google+, Trello, Popplet,
<b>Mobile in the DLE</b>	Twitter, Diigo



# REFLECTIONS AND THOUGHTS: A NEW CULTURE OF LEARNING

A new culture of learning has emerged from the social age:

- a multi-platform on-demand model;
- pixels on the screen;
- multi-threaded discussion environments;
- personalized and differentiated learnings;
- a node in a networked environment



Ref: OpenColleges

# REFLECTIONS AND THOUGHTS: CURRENT PRACTICE AND PEDAGOGICAL OUTCOMES OF INTERESTS

## PROVISION OF ADDITIONAL SUPPORT

(a) facilitating interactive engagement (so the unit does not appear boring);

(b) providing support for diversity

(c) encouraging team work (engineers must learn to work in a team).



# REFLECTIONS AND THOUGHTS: CURRENT PRACTICE AND PEDAGOGICAL OUTCOMES OF INTERESTS

Face-to-face

Teaching-focused

Traditional  
assessment tasks

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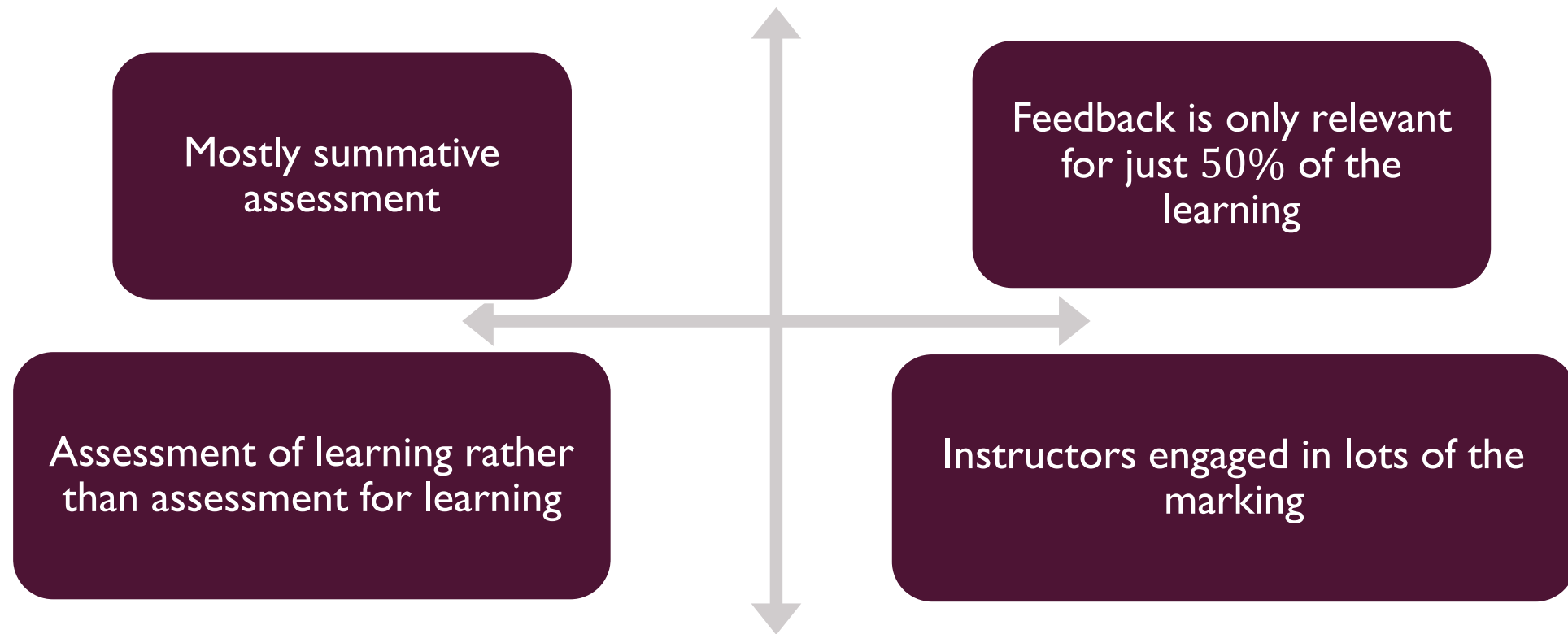
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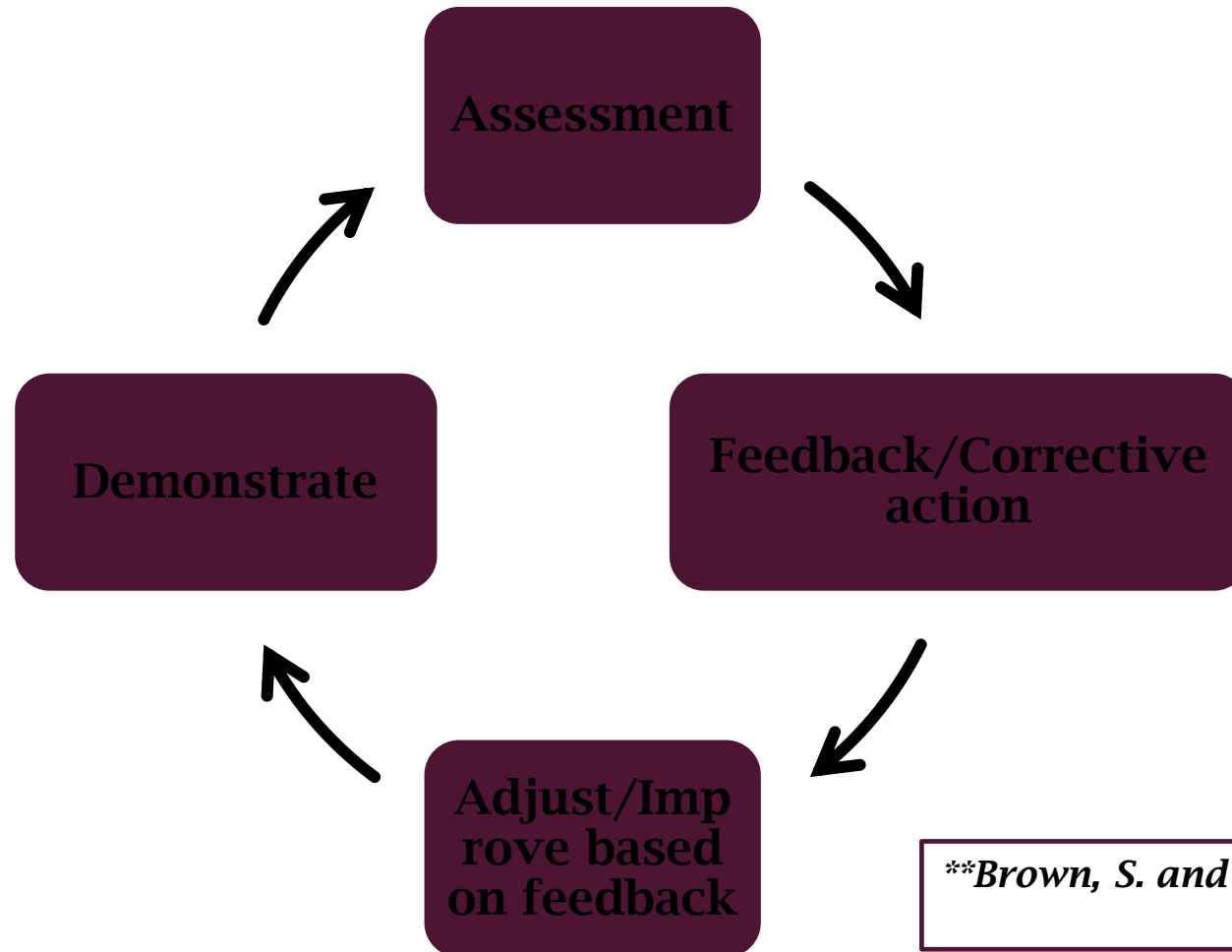
# REFLECTIONS AND THOUGHTS: CURRENT PRACTICE AND PEDAGOGICAL OUTCOMES OF INTERESTS

FORMATIVE PEER ASSESSMENT		TUTORIAL		SUMMATIVE ASSESSMENT		LECTURE			
Week 1		Week 2		Week 3		Week 4		Week 5	
Introduction to 3D concepts user interface and basic sketching principles		Sketch modification strategies Feature creation		Hole wizard/Fillet/Chamfer/Shell features		Advanced modeling tools (Patterns/Rib/Dome/Surface modeling etc)		Feature editing	
Basic Intro to Engineering Equation Solver (EES)		EES (Built-in functions Solving equations, Formatting)		Assignment 1 (SolidWorks)		EES (Lookup table etc)		Advanced features Uncertainty analysis	
								Assignment 2 (EES)	
Week 6		Week 7		Week 8		Week 9		Week 10	
Assembly		Advanced Assembly		Sheet metal		Photo-rendering/Animation		Drawing mode	
Advanced features Higher-order ODE/		Excel		Excel		Excel		Excel	
						Assignment 2 (EXCEL)			
Week 11		Week 12		Week 13		Week 14			
Simulation/Sustainability in Solid Modelling		Simulation/Sustainability in Solid Modelling		Simulation/Sustainability in Solid Modelling		Revision			
Simulation		Simulation		Simulation		FINAL EXAM			

# REFLECTIONS AND THOUGHTS: CURRENT PRACTICE AND PEDAGOGICAL OUTCOMES OF INTERESTS



# REFLECTIONS AND THOUGHTS: CURRENT PRACTICE AND TECH- ENHANCEMENT



*\*\*Brown, S. and P. Race (2012)*

# REFLECTIONS AND THOUGHTS: CURRENT PRACTICE AND TECH- ENHANCEMENT



Observation



Gap



Readiness



Progress &  
Accomplishment

◀ **Tech-enhanced Assessment** *for learning* ▶

# REFLECTIONS AND THOUGHTS: TECH-ENHANCEMENT

## INCLUSION OF PEER ASSESSMENT RELATED ACTIVITIES

FORMATIVE PEER ASSESSMENT				TUTORIAL		SUMMATIVE ASSESSMENT				LECTURE									
Week 1		Basic Intro to Engineering Equation Solver (EES)		Week 2		EES (Functions Solving equations)		Week 3		EES (Parametric studies Plotting etc)		Week 4		EES (Lookup table etc)		Week 5		Advanced features Uncertainty analysis	
Introduction to 3D concepts user interface and basic sketching principles		Activity 1		Sketch modification strategies Feature creation		Activity 2		Hole wizard/Fillet/Chamfer/Shell features		Assignment 1 (SolidWorks)		Advanced modeling tools (Patterns/Rib/Dome/Surface modeling etc)		Activity 3		Feature editing		Assignment 2 (EES)	
Week 6		Advanced features Higher-order ODE/		Week 7		Excel		Week 8		Excel		Week 9		Excel		Week 10		Excel	
Assembly		Activity 4		Advanced Assembly		Excel		Sheet metal		Activity 5		Photo-rendering/Animation		Assignment 2 (EXCEL)		Drawing mode		Excel	
Week 11		Simulation/ Sustainability in Solid Modelling		Week 12		Simulation		Week 13		Simulation/ Sustainability in Solid Modelling		Week 14		Revision					
Simulation				Simulation/ Sustainability in Solid Modelling		Activity 6		Simulation/ Sustainability in Solid Modelling		Simulation		Revision		FINAL EXAM					

## REFLECTIONS AND THOUGHTS: TECH-ENHANCEMENT AND TOOLS

- **Blackboard peer and self assessment tool**
- **Blogs (WordPress)**
- Google+
- SPARK
- PeerWise
- PeerMark



# REFLECTIONS AND THOUGHTS: TECH-ENHANCEMENT AND TOOLS

## Selection Criteria

- Provided and integrated with Blackboard (BB)
- Prior familiarity with the BB interface
- Worked seamlessly with the Turnitin assignment submission
- Offers control over distribution of work to be graded by each student

# REFLECTIONS AND THOUGHTS: TECH-ENHANCEMENT AND TOOLS

- **Blogs**
  - Immediate feedback
  - Documentation of personal reflections
  - Social presence
  - Level of progress
- **Discussion Board**
  - interactive engagement with the important concepts of the module as well as with other participants and the instructor in a networked learning
  - Paraphrasing/elaboration skill-builder
  - Active participation
  - Support diversity of opinion

# REFLECTIONS AND THOUGHTS: CHALLENGES WITH DISCUSSION BOARD

- Excessive use of discussion board can be a burden to **introverted students**;
- **Participation rates** can be a challenge if the activity of the discussion board is poorly designed and if the grade is not significant;
- **Long posts** can derail the flow of discussion;
- It requires the instructor to have a skill in **weaving and summarizing** to ensure the discussion flow in an intended direction;
- **Late posters** need to wade through the layer of discussion to find a couple of interesting points to comment upon.

# CONCLUSION

A remarkable transformation in the global use of learning technologies

The DLE module examines this transformative role of the learning

The DLE module exposed the participants to tools exemplifying social media technology, social networking sites (Facebook, Google+), multimedia hosting sites (YouTube, SlideShare, etc.), and blogging/microblogging sites (WordPress, Twitter

DLE provides for the democratization of the creation and consumption of contents

## CONCLUSION

Arrival of social age has re-defined the concept of learning from static to dynamic

The landscape of education has changed with newer technologies and educators have to go beyond content delivery

The use of technology can be divided into: (i) communication; (ii) information delivery; (iii) inverted learning; (iv) active learning; and (v) immediate feedback



THANK YOU