Building Information Modelling and Management Teaching in Geospatial Engineering, Civil Engineering and Architecture

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Introduction

• Some Background on BIM Teaching
• BIM Modules at Nottingham
• BIM Teaching Facilities
• Masters Courses
• Conclusions
BIM Education Background

China accounts for 47.9% of the Asia-Pacific construction industry value. (MarketLine, [1])

There were insufficient qualified BIM staff in China’s AEC project management. (SCTA & LC [2] and SZEDA) [3])
**BIM Education Background cont**

• Lack of BIM personnel or BIM expertise was perceived as one major obstacle in BIM usage in the industry in both UK and China. (SCTA & LC [2]., and Eadie et al. [4])

• The diversified BIM areas and new BIM movements have created a greater demand on competent BIM professionals and college graduates with relevant BIM knowledge. (Jäväjä, S.S.P. & Salin, J. [5])

• Insufficient resources and university conservations are key barriers to promoting engineering education to meet the demands. (Trine, [6])
BIM in China

The 2011-2015 National Program of AEC Informatisation Development was published in May 2011 by China Ministry of Housing and Urban-Rural Development, and set out its intention to decide BIM as one of the core technologies in survey, design and building industry in the 12th five-year national plan in China.
BIM Teaching at Nottingham

- H21EC1 – Engineering Communication
  - Compulsory 1st Year Module (BEng Civil Engineering)

- EE3BIM – Engineering Communication
  - Optional Final Year Module (BEng Civil Engineering, BArch Architecture), Compulsory for MSc

- H23TMB – 3D Modelling for BIM
  - Optional Final Year Module (BEng Civil Engineering, BArch Architecture), Compulsory for MSc
H21EC1 – BIM Content

- H21EC1 – Engineering Communication is designed to teach students effective communication through IT and personal abilities
- BIM was introduced into the module 3 years ago to complement the large CAD element of the module
- BIM Content
  - 2 Hours of lectures
  - 2 Workshops (Using REVIT)
  - 1 Coursework hand in (Essay)
EE3BIM – BIM Teaching

• Each student group consisted of members from different subjects;
• Teams use REVIT to produce BIM models in a collaborative process

Group Project Process
EE3BIM – BIM Teaching

An example of group project

1) Architectural form

2) Structural form

3) MEP system

4) Quantity take-off spreadsheet
The module describes data collection techniques and is focused on group project work.
Teaching Facilities

• D-CiTi BIM Lab
  • Opened December 2015
  • Funded by Ningbo Government
  • Multidisciplinary

• Photogrammetry and Remote Sensing Lab
  • Civil Engineering Department

• Extensive Software

• BIM equipped Computer Labs
D-Citi Lab

156 m²
18 3D Workstations
6 Ultra High Performance Workstations
2 Mobile Graphics Workstation
1 Meeting Room
1 Virtual Reality, Augmented Reality Demonstration room

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Software

BIM & Survey Software

3D

4D

5D

Collaboration Management

Survey Software and GIS

AUTODESK

SYNCHRO SOFTWARE

VICO SOFTWARE

Bentley

Leica Geosystems

Tekla

Trimble
MSc in Engineering Surveying and Geodesy

Core modules: 10/credits each

**Autumn semester**
- Fundamentals of Satellite Positioning
- Analytical Methods
- Geodetic Reference Systems
- Photogrammetry and Remote Measurement Techniques
- Research Project Literature Review

**Spring semester**
- Advanced Satellite Positioning
- Engineering Surveying
- Physical Geodesy
- Survey Field Course
- Research Project Organisation and Planning

**Summer semester 60 credits**
- Research Project – MSc dissertation
MSc in Geospatial Engineering with BIM

Core modules: 10/credits each

Autumn semester
Fundamentals of Satellite Positioning
Analytical Methods
Introduction to BIM
Photogrammetry and Remote Measurement Techniques
Research Project Literature Review

Spring semester
BIM Knowledge and Management
Engineering Surveying
Global Smart City with Integrated BIM
BIM+ and Its Future
Research Project Organisation and Planning

Summer semester 60 credits
Research Project – MSc dissertation
BIM Training

- Operation Skills Training
- Global BIM manager certification training
- BIM MSc and PhD
Summer School

- In July at Nottingham China
- Places still available
The Future

• To continue development of BIM content on the UG and PG courses at Nottingham
• To continue to develop CPD courses to train industry
• To Launch a full BIM MSc in the near future
References

THANK YOU

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