

## Tutorial title

**TOTaL: Technology Oriented Teaching and Learning,**  
Designing Online Learning for Computer Science Students

## Tutorial Developers and Presenters

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## Tutorial category

Half-day

## Tutorial outline description

The TOTaL tutorial uses the ICARE pedagogic model (Hoffman & Ritchie, 1998) to facilitate courseware authoring and to achieve consistency and coherence for computer science course provision. ICARE is a five-step instructional model, named to stand for *INTRODUCTION*, *CONTENT*, *APPLY*, *REFLECT* and *EXTEND*. The components of ICARE explore the learning objectives of each module and give students opportunities to move away from the narrative into collaborative activities, discussions, reflective exercises and online self-assessment. The aim is to induce a more active and constructivist learning experience. WebCT has been used for implementing the pedagogical model and for enhancing learner interaction by the use of its interactive facilities. The support mechanisms available in WebCT (Friesen, 2001) are used to facilitate student-tutor and student-student interaction.

The *ICARE* materials are split into sections:

- ◆ The *Introduction* serves to place each unit in the context of the module as a whole, and includes clearly stated objectives.
- ◆ The *CONTENT* section is primarily for presenting new information. Typically the *CONTENT* section presents a fairly linear development of the material with short 'in-line' exercises to summarise or test understanding.
- ◆ The *APPLY* section is the practice section of each unit. Hyperlinks from the *CONTENT* section offer the opportunity to move into activities with a wider, more exploratory scope. These may be computer-based, such as programming or design exercises, or paper-based, such as examining case studies, or web-based, such as visiting relevant web-sites. Their purpose may be to embed newly-gained knowledge or to motivate the introduction of the next sub-topic.
- ◆ The *REFLECT* section gives students an opportunity to reflect on their newly acquired skills and knowledge. Hyperlinks from the *CONTENT* section lead to questions designed to reprise recently-learned material in a reflective or synoptic way. Many of these may look like the descriptive components of typical examination questions, so they can also be used as revision aids.
- ◆ The *EXTEND* section has many possible functions: it can provide closure, prompt further exploration and learning, assess students' skills and knowledge. It contains a short Review Quiz to assist tutors in monitoring student progress and may also contain additional material provided by the author to allow keener students to explore beyond the confines of the syllabus.

## **Description of the tutorial**

- 8.45 Registration
- 9.00 Introduction: setting the context of distance mode education (Open, Distance, Asynchronous, Autonomous Learning)  
The pedagogic framework, Cognitive walk through an ICARE environment
- 9.30 Setting the unit context  
Demonstration of existing resources
- 10.15 Coffee
- 10.30 Hands-On /Quiz  
Design and implementation of objective tests
- 11.45 Future Trends
- 11.50 Open Discussion / Feedback

## **Background of the presenters**

**Elli Georgiadou** is a Principal Lecturer in Software Engineering at Middlesex University, London. Her teaching includes Software Metrics, Methodologies, CASE and Project Management. She is engaged in research in Software Measurement for Product and Process Improvement, Methodologies, Metamodelling and Software Quality Management. She has extensive experience in academia and industry and has been active in organising conferences and workshops under the auspices of the British Computer Society, the ACM British Chapter and various European programmes for Technology Transfer and development of joint curricula. She established a Distance Mode Initiative between a UK University and a Hong Kong Institute developing and offering technology-based learning. She has engaged in developing both the pedagogic framework as well as the development of materials. She designed and carried out evaluations of various initiatives in the UK, Greece, Spain, Finland, Hong Kong and Cyprus. She has published extensively in her subject specialism and on academic matters.

**Stylianios Hatzipanagos** is a Senior Lecturer in the School of Computing, Middlesex University. He is the module leader for Educational Multimedia and has also taught Internet Commerce and Commercial Web Development. He is involved in Global Campus, an international web based learning programme offering MScs in Business Information Technology/E-Commerce and in European and UK projects on innovative use of learning technologies. His PhD was on the design and evaluation of Interactive Learning Environments. His research interests are in design and implementation of web based learning environments, usability of computer interfaces, computer supported collaborative work, learning technologies for teaching computer science and computer based learning environments (e.g. simulations) for teaching science. He is the convenor of the ALERT (Adaptive Learning Environments) Research group at Middlesex University.

## **Paragraph for publication**

The TOTaL tutorial uses the ICARE pedagogic model to facilitate courseware authoring and to achieve consistency and coherence for computer science course provision. The components of ICARE give students opportunities to move away from the narrative into collaborative activities, discussions, reflective exercises and online self-assessment. The aim is to induce a more active and constructivist learning experience. WebCT has been used for implementing the pedagogical model and for enhancing learner interaction by the use of its interactive facilities. The tutorial will:

- discuss the pedagogic principles of the ICARE framework;
- demonstrate existing WebCT resources;
- provide an opportunity for hands-on activities and open discussion

## **Equipment needed**

Networked PCs with access to Internet (via IE and Netscape)