

The HAMK Implementation Model: Materials for Engineering Students in the Field of Construction

HAMK UNIVERSITY OF APPLIED
SCIENCES

Helena Parviainen / 18 March 2010,
Vaasa CLIL Seminar

Implementation of the LICI project
at HAMK University of Applied
Sciences, Finland

LICI = Language In Content Instruction

- a 3-year Lingua 2 project
- Carried out in 2006-2009
- 8 partners from 7 European countries:
Finland, France, Ireland, Italy, Hungary, Austria
and Lithuania
- Coordinator from Finland: Heini-Marja
Järvinen from University of Turku

AIMS OF THE LICI PROJECT

- language of learning and instruction in a CLIL (Content and Language Integrated Learning) environment
- The leading principle: by enhancing language in content teaching, the dual focus of learning both language and content is realized optimally, as language and content are integrated in CLIL

AIMS

- The language focus: the learning and teaching of language skills (listening, speaking, reading and writing), vocabulary and (relevant) grammar
- The theoretical basis: general and content-specific thinking skills and strategies
- Bernard Mohan's Knowledge Framework (links thinking skills with corresponding linguistic expression)

AIMS

- to develop language learning and teaching in CLIL by producing a principled and pedagogical model and a set of outputs based on the model.
- The LICl outputs are based on the model and they consist of:
- **teaching materials (DVD)** for teaching social sciences and science at primary (CEFR levels A1–A2) and secondary level (B1-B2), and **third level** sociology, **science** and marketing (B1 – C1)
- **a teacher's and trainer's handbook**, the target languages are DE, EN and FR. The products will be used by students, content and/or language teachers and teacher trainers.

Handbook LANGUAGE IN CONTENT INSTRUCTION

- Published in three languages : EN, DE, FR
 - a reference book
 - working tool for teachers, teacher trainers and teacher trainees

DVD accompanying the handbook

Contains a variety of teaching materials

- in the subjects of science and social science for the primary and secondary sectors
- sociology, engineering and marketing for the tertiary sector

A website

<http://lici.utu.fi>

- overviews of the handbook, in EN, DE, FR, IT, LT, HU, FI
- handbook available in EN, DE, FR
- teacher training and teaching materials (DVD)
- discussion forum
- links

Aim at HAMK

- Production of teaching material for third level science
- Construction engineering
- Special focus on writing skills

Implementation of the project

- In cooperation with a content teacher
- Field: construction engineering
- Theme: Steel construction
- Topic: design of cold-formed steel structures
- Special Course: Assembling and Connecting Cold-Formed Purlins and Profiled Sheets (3 cr)

Implementation of the project

- Content teacher taught the course in Finnish
- Language teacher (i.e. teacher of English) had a training session of 10 lessons taught in English
- Students had 10 extra lessons
- Content teacher gave the course plan and schedule to language teacher and provided material and sources on the topic of the course in English

MATERIALS USED BY THE LANGUAGE TEACHER

- **Helen Chen AN OVERVIEW OF COLD-FORMED STEEL STRUCTURES**
<http://www.pdhonline.org/courses/s101/s101.htm>
- Wei-Wen Yu: Cold-Formed Steel Design. Third Edition. John Wiley&Sons 2000.
- Light Steel Framing in Residential Construction. Building Design using Cold-Formed Steel Sections. The Steel Construction Institute. 2001
- Eurocode 3: EN 1993-1-3 design of Steel Structures Part 1-3: General Rules.
- PRESCRIPTIVE METHOD FOR RESIDENTIAL COLD-FORMED STEEL FRAMING Second Edition. 1997

Production of teaching material

- The above mentioned sources and course plan were used to find material that included some parts of the content taught in Finnish
- Some texts were chosen and adapted to produce CLIL teaching material. Most of the texts chosen come from Helen Chen's net course
- A permission was received to use this material in the LICl project (John Huang, Ph.D., PE, President, PDH Center, www.PDHcenter.com
- www.PDHonline.org)

Production of teaching material

- texts were chosen to cover the following topics of the course taught in Finnish:

Effect of Cold-Forming; Properties, Types, Applications and Advantages of Cold-Formed Steel, Regulations, Standards and Building Codes; Design and Failure Modes

Production of teaching material

The course requirements included a **design task/ assignment and writing a report**

Instructions on How to Write a Test Report
were included in the teaching material

Production of teaching material

The texts chosen and adapted were divided into 5 lessons:

- Lesson 1:
- What is Cold-Formed Steel?
 - Effect of Cold-Forming
 - Properties of Cold-Formed Steel
- Lesson 2
- Applications of Cold-Formed Steel
 - Types of Cold-Formed Steel
 - Advantages of Cold-Formed Steel
 - Regulations, Standards and Building Codes

Production of teaching material

Lesson 3

-Connections and Fastening
Techniques

Lesson 4

-Design and Failure Modes

Lesson 5

-Assignment
-Instructions on How to Write a
Test Report

Production of teaching material

- Various tasks were drawn up based on the chosen texts
- The tasks were divided into pre-tasks, during tasks and post tasks (including teacher's notes)
- Aim: to include higher order thinking skills (Mohan: Knowledge framework) and learning strategies (Chamot & O'Malley)
- Thinking skills tasks (e.g. classify, analyse, causal relations, evaluate etc)

Lesson plans

- A general lesson plan and a lesson plan for each lesson were drawn up containing:
- Content/knowledge goals
- Language goals
 - Vocabulary and concepts
 - Language structures/grammar
 - The four skills
 - Thinking skills and strategies

Lesson plan

- Lesson delivery
 - Pre-tasks
 - During tasks
 - Post tasks

Piloting of teaching material

- The material (texts and tasks) were piloted with the students while they were attending the content course in Finnish
- Students had extra 10 hours of teaching on the same topic but from the point of view of the English language

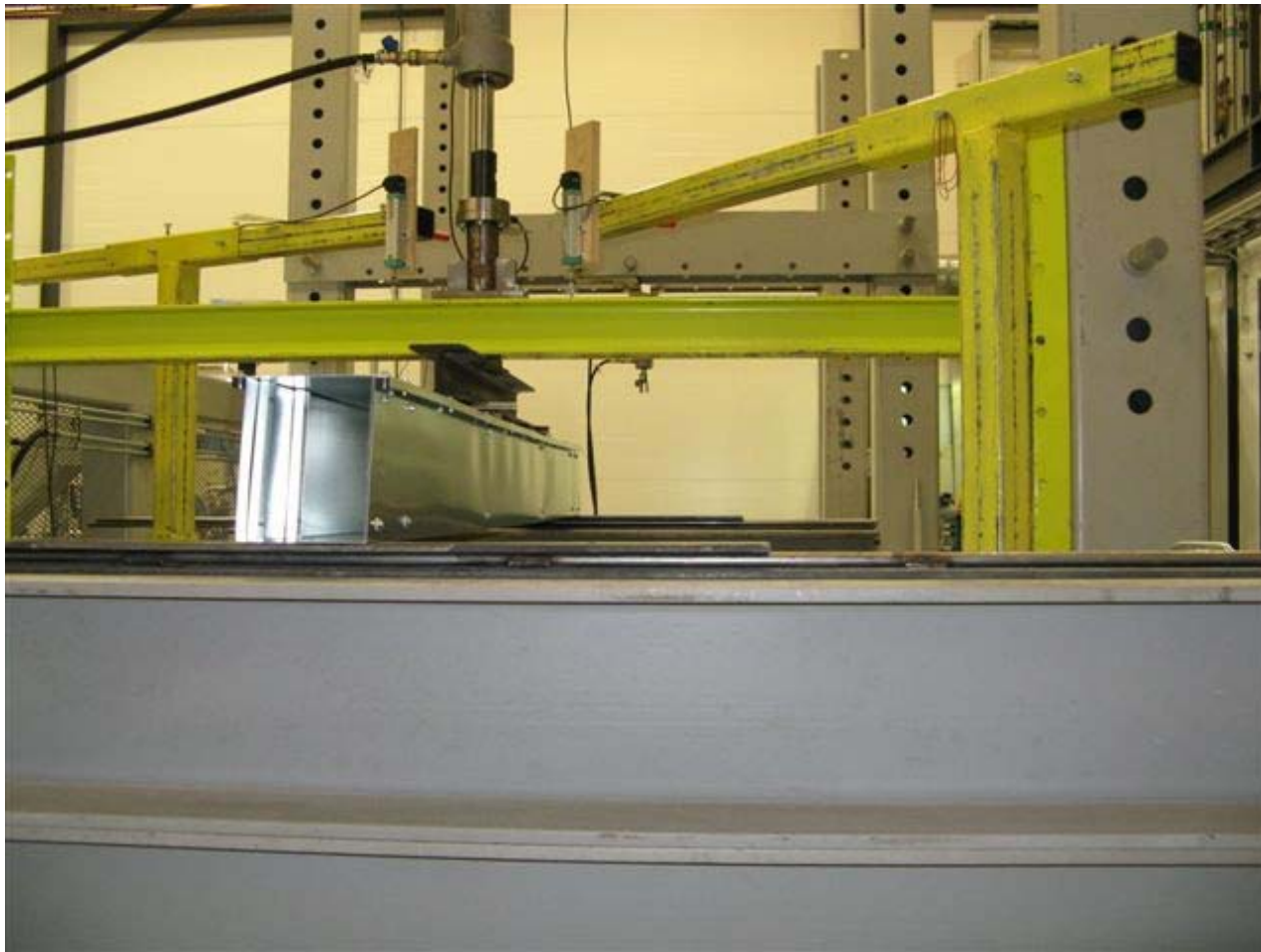
Design task

- Students had to **design, fabricate** and **test** a cold-formed steel beam made of thin steel sheet which should carry as much loading as possible (i.e. the total force F should be maximized)
- They also had **to write a test report** in English about their design and testing

Pictures of testing the beam



Pictures of testing of the beam



Pictures of testing the beam

