

**Case Method and Information and Communication Technologies in Teacher Training:  
The *TICEC* Project**

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## **Abstract**

Our society of knowledge demands the incorporation of Information and Communication Technologies (ICT) at all levels, including education and teacher training. The *TICEC* Project has developed a training methodology based on case study through ICT that aims to contribute to the improvement of initial teacher training and consequently to the educational systems in the different participating countries. The project was addressed to initial secondary school teacher training, but the methodology can also be transferred to other contexts and levels in education. It was a three year project involving five European universities and financed by the Socrates Comenius 2.1 Programme. The aims of the project were to select a set of real teaching-learning episodes concerning main contents of initial teacher training programs, to elaborate the previous selected episodes as study cases, to implement these cases designing a training methodology integrating ICT and case method as didactic tools and, finally, to apply and assess the products and the methodology.

**Key words:** Case study; Teacher education; Information and Communication Technologies; International cooperation.

## Introduction

The European Project *TICEC (Examining Case Studies with the aid of Information and Communication Technology)*\* involved five European universities to develop and implement a case-oriented methodology for pre-service secondary school teacher training, contributing to the improvement of the educational systems in the different participating countries.

As the didactic use of cases requests a dynamic methodology promoting analysis and allowing the use of multiple sources, the project intended to incorporate information technologies in the design of the materials and the methodology of use. Information and Communication Technologies (ICT) also facilitate the project aim to develop new interactive and flexible training contexts, involving novel methods of study and discourse for teacher-trainees, school mentors and teacher trainers in universities.

Exploring case method through ICT, ten multimedia products were designed and edited in CD-ROM support. Concerning different professional classroom skills, these didactic products are being used in teacher training programmes, where the cases may be explored by multiple procedures and in different interaction settings. The methodology can also be transferred to other training contexts and educational levels.

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## **Case Method and ICT in Teacher Training**

Concrete situations may constitute an important basis of knowledge that must be explored by practical and reflective learning processes. Case-oriented methodology favours this process, promoting interaction and active participation, based on critical reflection on real practices (Merseeth, 1994, 1996; Shulman, 1992). Allowing the contact with real situations of work contexts and practices, cases can have great importance in professional training. They are not simple illustrations: they permit an exploration by means of analysis and problem solving, which may promote a professional knowledge. Case methodology is also a rich and flexible strategy that can be used in different contexts and with diverse purposes, through different forms of presentation (Nath, 2005).

Assuming that the analysis of a case is crucial for its educational value, it is important to complete each situation with a variety of resources for analysing the case. ICT allow, not only an easier access to real situations, but also a richer support to the case analysis. The association of video excerpts and other types of documents in multimedia and hypermedia products enhances the variety and the richness of the cases. It allows repeated access to each situation with pauses to analyse it by means of various documental supports that could be related by hyperlinks. It also facilitates interaction between different users and group discussion in both synchronic and asynchronous modes, which are maximized by web technology.

These strategies and products open new wide possibilities for case-oriented methodologies in education and may deeply improve the use of case study in teacher training (Cannings & Talley, 2002).

## **The *TICEC* Project**

Founded by the European Socrates Comenius 2.1 Programme, the *TICEC* Project was developed during three years and involved five European universities: University of Alcalá de Henares (Spain) (coordinating), University of Coimbra (Portugal), Bolonia University (Italy), Leicester University (United Kingdom) and Comenius University in Bratislava (Slovakia). The work group included elements of the participant universities, assessors and other collaborators. The project had also the indispensable participation of collaborating teachers in secondary schools.

The project intended to incorporate case-oriented methodology and ICT to promote a reflective and practical teacher preparation in interactive and flexible training contexts (Brincones *et al.*, 2004).

The first task of the project work group was to elaborate a list of themes from the main contents of pre-service training programs. Involving parallel and comparative studies, this was an important opportunity of discussion between participants from different countries and scientific fields. From the analysis of secondary school pre-service training programs, emerged the main contents in the official curricular designs. Among these, a list of ten relevant themes for case study was elaborated and each participant university was responsible for working on two of them.

The next steps involved a long work process in collaboration with experienced teachers in secondary schools. After the construction of a guide-script for each theme or teaching skill, real lessons were video-recorded to be submitted to the process of case construction.

The case construction included selecting and editing video clips, constructing guidelines for their analysis and didactic explanation, as well as organising diverse documents and resources to support case study. All the materials were then composed in ten multimedia products, designed by the project staff in each university.

Ten multimedia products have been produced by the five participant institutions. These products concern important areas of teacher education and cover a wide range of professional teaching skills, including class management, student motivation, problem solving in science, teacher and pupils questioning skills, group work, drama and creative writing. Each product contains case studies of professional skills in classroom teaching, including video-cases of experienced teachers' lessons, guidelines for case analysis and discussion, documents, bibliography and terms glossary. These materials are presented in CD-ROM format, but can also be available through the internet. Therefore, distance strategies for the utilization of these products are of great interest.

### **A TICEC Product: Class Management CD-ROM**

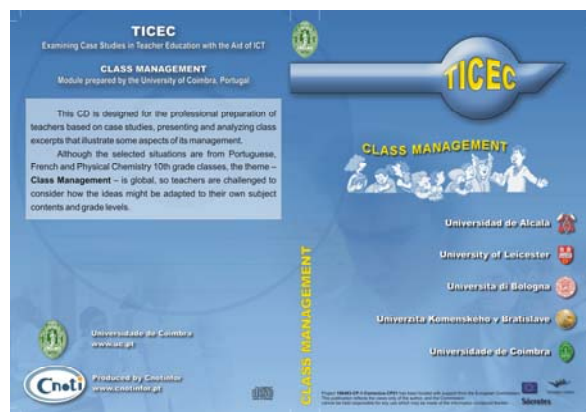
#### Presentation

The *Class Management* cases CD-ROM (Caldeira *et al.*, 2005) was designed and edited by the Portuguese project team in the Faculty of Sciences and Technology of the University of Coimbra (FCTUC), Portugal.

Class management is one of the main challenges faced by teachers (Arends, 1994). Being a basic condition of the learning process, it is also a complex one. It can be prepared in the planning phase of teaching, but depends largely on the unpredictability of classroom interaction.

There are different aspects involved: class work, time, resources, communication, participation, even pupils disturbing behaviours... These aspects are also complex, interrelated and cross-referenced by other dimensions like teaching methods, teacher styles, characteristics of students and contexts.

This CD-ROM presents and promotes the analysis of video excerpts that illustrate some aspects of class management. Although the selected situations are from sciences (Chemistry), mother tongue (Portuguese) and foreign language (French) 10th grade classes, the theme of class management is global, so users are challenged to consider how the ideas might be adapted to other subject contents and grade levels. The exploitation of these cases aims to promote reflection and professional knowledge in this field.



**FIGURE 1**  
Cover of the CD-ROM on *Class Management*

### Contents

As preliminary contents, the CD-ROM includes a starting page identifying the product and its context and three multimedia presentations with concise descriptions of the *TICEC* Project, the editor institution and the theme.

The selected cases concern seven class management items: beginning the lesson, task management, time management, resources management, communication and participation management, management of students' behaviour and finishing the lesson. Case materials include video clips of real lessons' excerpts, accompanied by observational guidelines and suggestions for reflection.



**FIGURE 2**  
Cases on *Class Management*

- Beginning the lesson

The beginning of a lesson is one of its most important moments, which may even be decisive for its development. On the other hand, the way a lesson begins varies with the task, the methods, teacher and pupil characteristics and their interaction. Different beginnings of lessons are presented that vary in task, methodology, teacher and group characteristics.

- Task management

Task has a central role in class, corresponding to what is expected from the students, including the cognitive and social demands. To accomplish the task, pupils engage in different activities, like listening to an explanation, taking part in a discussion, working alone or with classmates in small groups, researching, etc.. Learning activities influence the way teacher and pupils behave and relate. The pupils' involvement in the task is one of the fundamental aims in class management, so it is important to consider the aspects that may be influent.

- Time management

Time is simultaneously a context and a condition of teaching and learning processes, a resource and an element that must be planned and managed. Excerpts from different parts of lessons are presented to illustrate time management.

- Resources management

Educational resources allow the teaching-learning process and the development of lesson's tasks and activities. There are many class resources including space, time, material, human resources, etc.. Teacher plays an important role, both as a main resource and as the manager of the remaining ones. The evolution of educational technology generates more sophisticated equipment and products. Their use must be carefully considered and prepared, involving possible adjustments on teachers' role.

- Communication and participation management

Communication is intrinsic to the pedagogical process. Teaching and learning, organizing and managing the class, developing relationships, are all processes which rely on communication. Class communication varies with different participation structures, related to time and space management and the characteristics of the task, the students and the teacher.

- Management of students' behaviour

Managing students' behaviour is one of the main issues in class management, as it aims to create and maintain an environment favouring the involvement in the task and the work. Some situations are presented where challenging behaviours occur.

- Finishing the lesson

The end of the lesson is a sensitive and unstable moment, as the activities must be interrupted or concluded, simultaneously preparing the next tasks. In addition, it is an important moment as

it increases pupils' attention and retaining abilities. Different lessons' endings are presented, illustrating diverse dynamics and ways of concluding a task.

This cases were selected from videotaped real lessons of experienced teachers that voluntary collaborated with the project. The four presented lessons are from Chemistry, Portuguese and French 10th grade classes, involving different strategies and dynamics.



**FIGURE 3**  
Lessons illustrating *Class Management*

As complementary resources, the CD-ROM includes documents with notes on each item, bibliographical suggestions and a glossary of terms. All the written documents in the CD can be printed.

### Navigation

The navigation through the different contents of the CD-ROM permits various and flexible ways of studying the proposed cases. The presence of hyperlinks between the contents creates an intrinsic dynamics, which can be powered and adjusted to the different users' aims and contexts.

#### - Menu

On the main menu there are links to the different contents, which constitute different approaches to explore the theme: Cases, Lessons, Documents, Bibliography, Glossary and Final Thoughts.



**FIGURE 4**  
Main menu

In this menu, the user may choose the path to take. On a first approach, it is recommended to begin the exploration by CASES, which is a more directive path, generating questions whose answers may be found in the other contents. It is possible to return at anytime to the main menu and choose a different path. This backtracking may also be done, quickly and easily, through six buttons always present on an upper bar.

- Cases

In the case menu there are links to the different cases, grouped in the seven described class management items. There is no defined order for exploring the cases, so the user can choose any of them.

For the study of each case, it is possible to read the abstract of the case, to view the video clips in sequence or separately, to consider the observational guidelines and the suggestions for reflection, taking notes, answering questions, discussing different answer, etc., to review the videos and return to a reflection as many times as convenient or wished, to follow the links to the bibliography, the documents or the glossary.



**FIGURE 5**  
Example of a case

- Lessons

The lessons menu allows access to the video clips grouped in the respective lesson sequence. Its observation gives the user a global perspective of each lesson, and so, of the cases contexts. Lessons can also be analysed following reflection guidelines that include links for other resources in the CD-ROM. The lessons' approach allows a more global and complete analysis, which favours a reflection on the different elements of class management and its interaction.



**FIGURE 6**  
Example of a lesson

- Final Thoughts

In Final Thoughts, a final reflection is suggested, after exploring the CD-ROM through all its paths and reaching a global view of the subject. Nevertheless, this task may constitute also a

starting point for a new deepened analysis, continuing the reflection and the learning process in course.

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