IMPLEMENTING CASE STUDIES IN TEACHER EDUCATION WITH THE AID OF INFORMATION AND COMMUNICATION TECHNOLOGIES

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Abstract

The project described here involved international cooperation to implement a teacher training methodology based on case study [methodology], with the aid of information and communication technologies.

University partners from five countries edited a series of ten multimedia products integrating video cases covering a range of professional teaching skills. These materials were designed for training pre-service secondary school teachers. The methodology can be transferred to diverse training contexts and educational levels.

KEY WORDS: Case study, Information and communication technologies, Multimedia cases, Reflective teacher training, International cooperation, Class management.

INTRODUCTION

The project discussed here is a European project¹ that involved international cooperation to promote reflection about teacher training and to contribute to its improvement in the participant countries.

The project developed a case-oriented teacher training methodology with the aid of information and communication technologies (ICT) by producing diverse multimedia materials for teacher training based on video cases on professional classroom skills. The use of these materials engages active and reflective strategies, crossing the gap between theory and practice, and promoting professional development [Brincones et al., 2004].

The didactic products are being used in pre-service secondary school teachers' training programmes, where the cases can be explored by multiple procedures and in different settings. However, the methodology could also be transferred to other training contexts and educational levels.

Current challenges are related to the implementation and dissemination of the proposed methodology and products, not only in formal teacher training contexts, but also in new educational environments supported by web technologies.
CASE METHOD AND ICT IN REFLECTIVE TEACHER TRAINING

CASE METHOD IN REFLECTIVE TEACHER TRAINING

The reflective paradigm in teacher education [v.g. Schön, 1987] assumes that concrete situations may constitute an important basis of knowledge that must be explored by practical and reflective learning processes.

Allowing contact with real work situations, cases have great importance in professional preparation. This is particularly relevant in pre-service teacher training contexts, where they can bridge the gap between theory and practice, engaging the processes of observation, reflection, and discussion, with real contexts and activities [Stigler & Hiebert, 1999].

Cases are not simple illustrations; they must permit exploration, through problem solving and reflection, which develops professional knowledge. Case studies should promote not only interaction, exchange of ideas, and active participation, but also open and critical reflection on real practices, supported by theory [Merseth, 1994; 1996; Shulman, 1992].

Case study is also a rich, various and flexible strategy that can be used in different contexts with diverse purposes, through different presentation modes [Nath, 2005]. ICT open new possibilities in this domain.

CASE METHOD WITH THE AID OF ICT

Assuming that analysis of a case is essential for its educational value, it is important to provide a variety of resources for case analysis. ICT allow not only an easier access to real situations, but also richer support to case analysis.

Video excerpts and other types of documents in multimedia and hypermedia enhance the variety and the richness of the cases. They allow repeated access to each situation, with pauses to analyse it by means of various document supports, potentially reached through hyperlinks. Web technologies also facilitate interaction between different users and discussion in both synchronous and asynchronous modes.

These strategies and tools open new possibilities for case-oriented methodologies in education and may deeply improve the use of case study in teacher training [Cannings & Talley, 2002; 2003; Perry & Talley, 2001]. The utility of these materials is particularly relevant in pre-service teacher training, where “video case studies (both CD and online) are emerging as a tool to bridge the gap between theory and practice” [Cannings & Talley, 2003, p. 17].

THE TICEC PROJECT

AIMS OF THE PROJECT

The “Examining Case Studies in Teacher Education with the aid of Information and Communication Technology” (TICEC) project developed a case-oriented methodology for pre-service teacher training, contributing to the improvement of educational systems in the different participating countries.

The main project goals were to construct and implement a range of materials for the professional training of teachers based on case studies of professional skills in classroom teaching.

As the didactic use of cases demands a dynamic methodology promoting analysis and allowing the use of multiple sources, the project was designed to incorporate information technologies in the materials and the methodology. ICT was also designed to develop new interactive and flexible training contexts, involving novel methods of study and discourse, for student teachers, school mentors and teacher trainers in universities.

DEVELOPMENT

The project was developed during three years (2002 to 2005) and was funded by the European Socrates Comenius 2.1 Programme.
Five European institutions were involved: University of Alcalá (Spain) (coordinating), University of Coimbra (Portugal), Bolonia University (Italy), Leicester University (United Kingdom) and Comenius University in Bratislava (Slovakia).

The working group included representatives from the participant universities, assessors and other collaborators. The project also had the indispensable participation of collaborating teachers in secondary schools.

The main tasks of the project workgroup were:

- to select a list of themes from the main contents of pre-service training programs;
- to elaborate a guide-script for each theme;
- to collect real teacher/learning situations that illustrate the themes;
- to construct the selected situations as study cases;
- to implement the cases through ICT, designing a didactic tool that integrates the cases;
- to apply and assess the materials and the methodology.

The first task, using a comparative approach to select themes, was an important opportunity for study and discussion among the participants from different countries and scientific fields. Through the analysis of secondary school pre-service training programs, the main themes in the diverse official curricular designs emerged. Among these, ten relevant themes for case study were selected, with each participating university responsible for 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 and cases were constructed. This involved selecting excerpts and editing video cases, constructing guidelines for their analysis and didactic explanation, and organising a variety of documents and resources to support the case studies. All the materials were then organised in ten multimedia products, designed by the project staff in each of the different participating universities. The resulting differences among the products provided a collaborative opportunity to improve exchanges and research.

Public seminars were organised to disseminate the methodology and to analyze and evaluate the training materials, yielding dialogue between project staff and products’ users. These seminars have been attended by teachers’ trainers, teacher trainees, and secondary school teachers, creating opportunities to discuss many aspects of professional teacher preparation.

OUTCOMES

Ten multimedia products have been produced by the five participating institutions. These products cover a range of professional teaching skills, including class management, student motivation, problem solving in science, teachers’ and pupils’ questioning skills, group work, drama and creative writing.

Each product contains case studies of professional skills in classroom teaching, including video sequences of experienced teachers’ lessons, guidelines for case analysis and discussion, documents, bibliography and terms glossary.

The materials are presented in CD-ROM format, but they can also be available online, exploiting the use of digital technologies to facilitate novel methods of study, discourse and interaction.

As the project was mainly addressed to secondary school teachers’ pre-service training, the methodology and the products have been mainly tested and applied in these contexts. However, they have also been used for in-service training, including teachers, school mentors and teachers’ trainers.

Particularly with in-service training, online strategies are of great interest. Therefore, current challenges include the implementation and assessment of the proposed methodology and products in new educational environments supported by web technologies, in both synchronous and asynchronous modes.

AN EXAMPLE: CASES ON CLASS MANAGEMENT

Following is presented an example of the TICEC products: the Class Management CD-ROM edited by the Faculty of Science and Technology at the University of Coimbra (FCTUC), Portugal [Caldeira et al., 2005].
Presentation

Class Management CD-ROM is a multimedia product designed for the professional preparation of teachers based on case study. It presents and promotes the analysis of video cases on some aspects of class management.

Class management is one of the main challenges faced by teachers. A basic condition for the learning process, it is also a complex one. While a teacher can prepare for classroom management, success depends largely on the unpredictability of classroom interaction. There are different aspects involved: class work, time, resources, communication, participation, sometimes pupils’ disturbing behaviour. These aspects interact with other dimensions like teaching methods, teaching styles, characteristics of students, and educational contexts.

In this CD-ROM, different cases on class management are presented. The exploitation of these cases aims to promote reflection and professional knowledge in this field.

Contents

• Preliminary contents

The CD-ROM includes a starting page identifying the product, with three multimedia presentations with concise descriptions of the TICEC project, the editor institution and the study theme.

• Cases

The selected cases include 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.

The case materials include video clips with real class sequences, accompanied by observational guidelines and suggestions for reflection.
FIGURE 2
Cases on Class Management

- Beginning the lesson
  The beginning of a lesson may be decisive for its development. Different beginnings of lessons are presented that vary in task, methodology, teacher and class characteristics.

- Task management
  The task has a central role in class management. 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. The involvement of pupils in the task is one of the fundamental aims in class management, so it is important to consider the task aspects that may be influential.

- 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 lessons illustrate time management.

- Resources management
  Educational resources allow the teaching-learning process and the development of lesson’s tasks and activities. Class resources include space, time, material, human resources, etc. The evolution of educational technology generates more sophisticated equipment and products. Its use must be carefully considered and prepared, with possible adjustments in the teachers’ role.

- Communication and participation management
  Communication is intrinsic to the pedagogical process. Class communication varies with different participation structures, related to time and space management and to 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. Different lesson endings are presented, illustrating different ways of concluding a task.

- Lessons
  The cases were selected from videotaped real lessons of experienced teachers that voluntarily collaborated with the project. The four presented lessons are from sciences (Chemistry), mother tongue (Portuguese) and foreign language (French) 10th grade classes, thus involving different strategies and dynamics. As the theme of class management is general, users are challenged to consider how the ideas might be adapted to other subject contents and grade levels.
The lesson materials include all the selected video clips from each lesson, its overview and suggestions for reflection.

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

- **Lesson A** - Writing a literary text (Mother tongue - Portuguese)
  The task of writing a literary text is prepared as the teacher asks pupils questions, accepts and complements their contributions, and builds a scheme on the blackboard. The conclusion of the task is individual homework.
- **Lesson B** - Laboratory activity in small groups (Chemistry)
  Pupils work in small groups performing a laboratory activity. The teacher gives them instructions and answers their questions, supervising the different phases of the task.
- **Lesson C** - Preparing an oral presentation in groups (Chemistry)
  The pupils are organized in small groups, and the teacher begins the lesson by clarifying the task, which is to prepare an oral presentation. This task is developed with different resources and the teacher’s support.
- **Lesson D** - Analyzing a text (Foreign language - French)
  After some routine activities, the lesson begins with the pupils reading a text. Then the teacher explores the text asking questions, trying to involve the whole class.

- **Complementary resources**
  As complementary resources, the CD-ROM includes documents, bibliography and a glossary of terms. All the documents in the CD can be printed.

**Navigation**

The system for navigating through the contents of the CD-ROM permits flexible ways of studying the proposed cases. Hyperlinks relating the contents create an intrinsic dynamic, which can be adjusted to different contexts and users’ aims.

The role of the supervisor or the tutor is important, although it is also possible to develop autonomous use of the materials, in a self-directed approach.

- **Menu**
  On the main menu there are links to the different contents for exploring the theme: Cases, Lessons, Documents, Bibliography, Glossary and Final Thoughts.
In this menu, the user may choose the path to take. On a first approach, we recommend beginning with Cases, generating questions whose answers may be found in the other contents. It is possible to return anytime to the main menu and choose a different path, through six buttons always present on an upper bar.

- **Cases**

In the “cases” menu there are links to the different cases. There is no pre-defined order for exploring the cases.

For the study of each case, it is possible:
- to read the summary 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 answers, 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.
• Lessons

The lessons menu allows access to the video clips grouped according to their sequence in the lesson. This gives the user an overview of each lesson and of the case contexts.

The lessons can be analysed following with the aid of reflection guidelines that include links to other resources in the CD-ROM.

**FIGURE 6**
Example of a lesson

**Final thoughts**

In the Final Thoughts section, a reflection is suggested, after exploring the CD-ROM through all the paths and reaching a global view. This task may constitute also a starting point for further, deepened analysis.

**FIGURE 7**
Final thoughts - a last but not least task
ENDNOTES

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